A FORMATIVE EVALUATION

OF

THE STRONGER SMARTER LEARNING COMMUNITIES PROJECT

2011 REPORT

Prepared by the Core Research Team,

Faculty of Education

Queensland University of Technology

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Executive Summary

This report is a formative evaluation of the operations of the DEEWR funded Stronger Smarter Learning Community (SSLC) project from September 2009 to July 2011. It is undertaken by an independent team of researchers from Queensland University of Technology, the University of Newcastle and Harvard University.

It reports on findings from: documentary analysis; qualitative case studies of SSLC Hub schools; descriptive, multivariate and multilevel analysis of survey data from school leaders and teachers from SSLC Hub and Affiliate schools and from a control group of non-SSLC schools; and multilevel analysis of school-level data on SSLC Hubs, Affiliates and ACARA like-schools.

Key findings from this work are that:

- SSLC school leaders and teachers are reporting progress in changing school ethos around issues of: recognition of Indigenous identity, Indigenous leadership, innovative approaches to staffing and school models, Indigenous community engagement and high expectations leadership;
- Many Stronger Smarter messages are reportedly having better uptake in schools with high percentages of Indigenous students;
- There are no major or consistent patterns of differences between SSLC and non-SSLC schools in teacher and school leader self-reports of curriculum and pedagogy practices; and
- There is no evidence to date that SSLC Hubs and Affiliates have increased attendance or increased achievement gains compared to ACARA like-schools.

Twenty-one months is relatively early in this school reform project. Hence the major focus of subsequent reports will be on the documentation of comparative longitudinal gains in achievement tests and improved attendance.

The 2011 and 2012 research also will model the relationships between change in school ethos/climate, changed Indigenous community relations, improved curriculum/pedagogy, and gains in Indigenous student achievement, attendance and outcomes. The key challenge for SSLC and the Stronger Smarter approach will be whether it can systematically generate change and reform in curriculum and pedagogy practices that can be empirically linked to improved student outcomes.

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QUANTITATIVE ANALYSIS APPENDICES

Glossary of Terms

Acronym	Definition
ACARA	Australian Curriculum, Assessment and Reporting Authority
Affiliate schools or Affiliates	Stronger Smarter Learning Communities Affiliate Schools
DEEWR	Department of Education, Employment and Workplace Relations
Hub schools or Hubs	Stronger Smarter Learning Communities Hub Schools
ICSEA	Index of Community Socio-Educational Advantage
IERG	Indigenous Educational Reference Group
Indigenous	The term Indigenous may refer to Aboriginal and/or Torres Strait Islander people, as appropriate in local contexts.
IRG	International Reference Group
Like Schools	Refers to definition as used by ACARA for reporting on the MySchool website. Like schools are schools serving students from statistically similar backgrounds. Factors used to determine a group of similar schools are the socio-educational backgrounds of the students' parents, whether the school is remote, the proportion of Indigenous students, the proportion of students from a language background other than English, or a combination of these factors. These factors are used to create an ICSEA value for each school.
AEP	National Aboriginal and Torres Strait Islander Education Policy
NAPLAN	National Assessment Program Literacy and Numeracy
Non-SSLC schools	Non Stronger Smarter Learning Communities Schools
QUT	Queensland University of Technology
RPRT	Regional Partner Research Team
SSI	Stronger Smarter Institute
SSLC	Stronger Smarter Learning Communities
SSLP	Stronger Smarter Leadership Program

Section 1 Introduction

This is the first report of three annual reports on the Stronger Smarter Learning Communities (SSLC). In the *Project Implementation Plan* (Indigenous Education Leadership Institute, 2009, p. 4), the parameters of the research component of the project are set out as follows:

> **Quality research**
> To develop and sustain a world-class model of educational research and evaluation for the project which:
>
> a. collects and analyses quantitative and qualitative data on key educational indicators of the comparative impact of project interventions;
> b. identifies and traces key factors affecting the trajectories of influence used to develop and sustain improvements in the quality of and outcomes from Indigenous education in and across the various SSLC sites;
> c. reports, on a timely basis, developing project outcomes, achievements and issues in a readable style; and
> d. provides, over time, proximate support for school leaders in the documentation of transformed practices.
>
> **Policy advice**
> To provide, based on SSLC project experience and research findings, information to governments and education authorities concerning:
>
> a. conditions which appear to affect the sustainability of transformed practices in schools for Indigenous education;
> b. conditions which appear to affect the national scalability of network-based reform strategies for Indigenous education; and
> c. potential implications for policy and planning involved in implementation of transformative approaches to Indigenous education.

The following report addresses each of these parameters. It describes the implementation of SSLC. It also documents and analyses its effects and outcomes to date in terms of school change and improvement of Indigenous student outcomes.

This is an independent formative and summative program evaluation of SSLC, as specified in the contract between Department of Education, Employment and Workplace Relations (DEEWR) and Queensland University of Technology (QUT). That contract set the criterion of efficacy of SSLC as the need to address the National Aboriginal and Torres Strait Islander Education Policy (AEP). The evaluation has been conducted by a research team at Queensland University of Technology (QUT), with participant members from QUT, University of Newcastle and Harvard University. The 13 member research team includes three Australian Aboriginal researchers and one Native American researcher. Infrastructure and support have been provided by the QUT Faculty of Education.

The research team has been assisted by participating staff of SSLC, who have provided information, liaison and cooperation at every stage of the research. It has also received the cooperation and support of SSLC school leaders, staff and community members, participating state systems and selected "non-SSLC schools" who have generously provided time and data (see Appendix 2.2 for further information about data sets).

The research team has received expert advice on design, instrumentation and ethics from: the SSLC Project Committee, the International Reference Group (IRG), and the Indigenous Education Reference Group (IERG). The latter two groups have consisted of leading Indigenous and non-Indigenous researchers and academics nationally and internationally. All participating staff and advisors are listed in Appendix 2.1 (Committees and Reference Groups).

This is a *formative* research report – the first of three major reports to be delivered to the Project Committee and DEEWR in 2011, 2012 and 2013. It documents the first 20 months of implementation of the SSLC program over the period September 2009 to June 2011, noting key findings, describing achievements to date, and identifying challenges and issues. It concludes with constructive recommendations for consideration by SSLC leadership and schools for 2011-2012 operations. The 2012 report will also be formative. The 2013 report will be a *summative* research report.

This is an independent research report. In the spirit of the QUT/DEEWR contract, it has been undertaken with the assistance of SSLC staff, but remains an autonomous evaluation that is separate from any research component of SSLC. The evaluation research reported here has been conducted at arm's length from SSLC operations. This ensures the scientific validity, the ethical integrity and policy credibility of the research. It acknowledges Indigenous communities as central stakeholders in a project of this scope.

The research design, (which is described in Section 2 of this report) is a comprehensive social science design. It uses mixed methods: comprised of re-analyses of large-scale systemic quantitative data, analyses of survey data, and qualitative case studies of selective participating schools. It follows standard social science ethical protocols as required by participating universities, state systems and schools. It attends to relevant cultural protocols for the engagement of Indigenous communities and peoples (see Appendix 2.3 for statement of ethical conduct).

The 2011 report is cross-sectional, describing the results of the first 20 months of SSLC operations. It uses systemic data made available by ACARA for analyses of school outcomes. It is meant to provide formative directions for 2011-2012 planning and operational targets for SSLC.

The 2012 and 2013 reports will be both cross-sectional and longitudinal, with a multilevel analysis of value-adding and growth data on school achievement and attendance. Full individual student data sets will be available by that time. The 2012 and 2013 reports will feature a major study of Indigenous community, student and staff views on SSLC undertaken by Indigenous members of the research team and IERG (see Appendix 2.4 for details of Complementary Study). Finally, the 2013 report will provide a summative report on efficacy, sustainability and scalability of reform in Aboriginal and Torres Strait Islander education.

This report, then, is a descriptive and analytic account of SSLC's operations, from its conception in 2009 to mid-2011. It is presented in two parts:

Section 2	Provides a descriptive overview of SSLC and its Hub schools, reporting on selective qualitative case studies of selected Hub leaders' and teachers' communication patterns. It describes the picture on the ground in selected Hub schools, illustrating the uptake of Stronger Smarter messages.
Section 3	Provides a multivariate and multilevel analysis of leader and teacher surveys on self-reported views and practices, and a multilevel analysis of school-level achievement and attendance data comparing SSLC and non-SSLC schools. It describes the uptake and implementation of Stronger Smarter strategies in schools, and comparative patterns of achievement test gain-scores and attendance value adding.

The report concludes with recommendations for SSLC and DEEWR in the 2011-2012 SSLC operations and development (see Section 4 of this report).

Section 2 Qualitative Analysis and Case Studies

2.1 Development and Implementation of SSLC

This section provides an abbreviated chronological description of the development of SSLC to date. The Stronger Smarter Leadership Program (hereafter, SSLP) began in 2006, developed by Dr. Chris Sarra and colleagues to propagate the messages taken from the experiences of Cherbourg State School whilst Sarra was principal. These experiences were also documented in Sarra's doctoral thesis (Sarra, 2005), which has recently been revised, updated and published as a monograph (Sarra, 2011). The Stronger Smarter philosophy developed five key themes, which were originally framed as:

1. Acknowledging, developing and embracing a positive sense of Aboriginal identity in schools;
2. Acknowledging and embracing Aboriginal leadership in schools and school communities;
3. 'High expectations' leadership to ensure 'high expectations' classrooms, with 'high expectations' teacher / student relationships;
4. Innovative and dynamic school staffing models, especially for community schools; and
5. Innovative and dynamic school models in complex social and cultural contexts.

By 2009, SSLP had run regular residential sessions of various iterations of the training program for an estimated 152 participants from 65 workplaces, in 2010 there were 247 participants from 139 workplaces and in 2011 to date there have been 153 participants from 68 workplaces. These efforts have received philanthropic support from the Telstra Foundation and the Sidney Myer Fund, and from state governments.

In 2009, Stronger Smarter Institute (hereafter, SSI) staff developed plans for a project that would scale up the Stronger Smarter model beyond the training program. They proposed a network of schools – based on a "communities of practice" or "learning communities" model – that would spread the key messages about school reform and about the education of Aboriginal and Torres Strait Islander students. The aim was a national network of schools with a shared philosophy and commitment to improved outcomes for Indigenous students and communities. The schools were selected on the basis of a demonstrable track record of improvement and excellence in Indigenous student outcomes. Such a network was proposed to work with and across state systems that have diverse and varied policies on Indigenous education, school reform, structure and staffing, as well as across differing demographic levels within each state.

The network was structured to work through regular face-to-face and digital communications, periodic events and meetings. What were termed "Hub" schools were to liaise with SSLC staff, in order to generate and aggregate relations with several "Affiliate schools" (in instances, feeder schools, regional clusters or schools with prior longstanding professional, administrative or philosophic links) for purposes of collaborative exchange, modeling and development. The network was designed to set the grounds for the recognition, dispersal and scaling up innovation and demonstrable quality and efficacy in improving Indigenous student outcomes. A school development grant ($9 000 - $15 000) was to be allocated to each Hub on entry. School community development grants
($10 000 - $15 000) based on a funding model of 2:1, would also be available to schools

meeting specific criteria. The core operations of SSLC, then, were: the facilitation of communications between schools in the dissemination of Stronger Smarter themes and messages, affiliated research and ideas; the provision of incentive grants for implementation of practice; the collection and dissemination of exemplary stories or models amongst Hubs and Affiliates.

While developing the *Project Implementation Plan,* SSI staff approached the QUT Faculty of Education, to assemble a research team to design a research evaluation program. The evaluation was to generate and monitor formative evidence on the progress and efficacy of SSLC and, in so doing, provide summative policy advice on the scalability and sustainability of network-based school reform in Indigenous education. With consultation of SSI staff and the Dean of the QUT Faculty of Education, a team was assembled, a research design developed and budgeted, and consultative structures put in place. The research team met with SSLC staff to finalise the research design in September 2009. The research team has provided written reports to the Project Committee and DEEWR on progress and modifications in design, instrument-development, ethical protocols and clearances, and data collection as per contractual agreement.

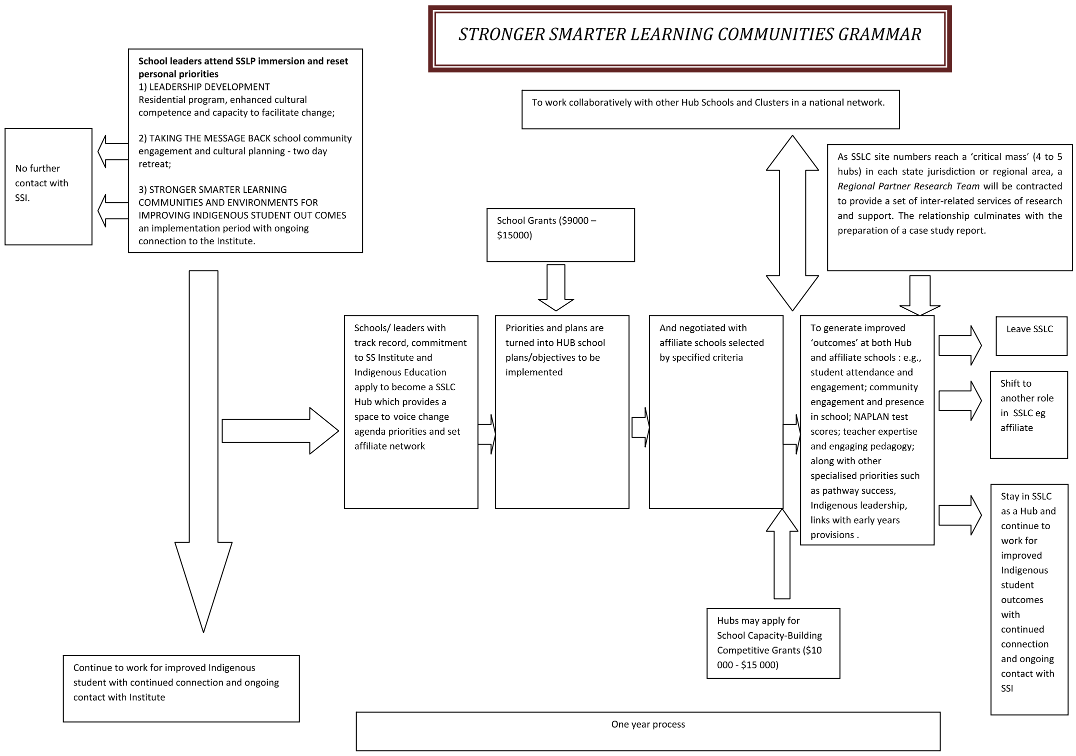

Figure 2. 1 **Program Logic of SSLC**

Figure 2.1 outlines the program logic of SSLC. Moving left to right it describes the scenario of school leaders moving from SSLP into Hub or Affiliate participant status, to translating Stronger Smarter core messages into changes in school operations that generate improved outcomes for Indigenous students. The research team generated this "grammar" as an ideal type of the proposed reforms that could be tested for efficacy, scalability and sustainability.

To develop a core of initial SSLC Hub schools, a core of principals was convened to discuss the parameters of SSLC in February 2009. From this group 13 leaders were selected; SSLC was commenced as a working project across 12 schools during the later parts of 2009. The original set of 12 schools proposed included one school in Northern Territory (NT). Subsequently, to accommodate the transfer of key staff, this school was replaced with an additional New South Wales (NSW) school. The final set of twelve schools was located in Western Australia (WA), Queensland (Qld) and NSW: comprising five primary schools, five secondary schools and two multi-campus colleges. Six of these original 12 schools had a significant percentage of Indigenous students and were located in remote towns or Indigenous communities.

According to the Project Implementation Plan (Indigenous Education Leadership Institute, 2009), the twelve school community sites that were engaged as the Round 1 SSLC Hubs where selected according to these criteria:

- Demonstrated success in Indigenous community engagement;
- Evidence of improved rates of Indigenous student attendance;
- Evidence of improved student achievement and outcomes (especially on State and NAPLAN benchmarks); and
- Capacity to sustain own school reforms and willingness to assist other schools to initiate similar reforms.

The final version of the Project Implementation Plan was sent to the Project Board in mid August 2009. It stated the objectives of the project as being:

- Setting up a National Network;
- Taking an outcomes focus to success;
- Sustain able transformation in schools through support provided by SSLC;
- Supporting the development of Learning Communities where Hub schools worked with three to four affiliate schools;
- Production of quality research of the project;
- Providing policy advice to systems and governments about the sustainability and scalability of school networks that support improved Indigenous education.

SSLC was launched at the Stronger Smarter Summit in late September 2009 by then Education Minister and Deputy Prime Minister, Julia Gillard. The position of Network Co-ordinator was also announced at this Summit. Hub schools were highlighted in Summit seminar sessions, many of the thirteen SSLC core leader group were featured on panels and other session formats. The SSLC core leaders met with the research team the day after the Summit.

In October and November of 2009, respectively, the research team met to discuss the research design with IRG and IERG. At each of these meetings, written recommendations for SSLC and for the research team were tabled. These are noted in Project Committee papers and minutes. Research design modifications that resulted from these meetings were tabled at the Project Committee meeting. These included: a stronger focus on Community views; fieldwork to include Indigenous community members and students' views; consideration of "pedagogy" and "curriculum" as factors which might influence value-adding and gain scores in achievement. IRG and IERG endorsed the research design. Both groups supported calls for increases in Indigenous participation in the research team and additional staff for SSLC.

Original plans for growth of the National Network from the Core SSLC Hub Leaders are detailed in Table 2.1 below. These plans were adjusted late in 2009 due to delays with contracts and memoranda of agreement with State governments. The final column of Table 2.1 details the actual Hubs in the network during each year of the project. Announcement of each year’s intake has usually occurred sometime between March and June, with the Hubs actually coming on board in the second half of each year.

Table 2. 1 **Proposed and actual Hubs in national network each year**

Year	Originally proposed number of Hubs working in the network	Adjusted plans in October 2009 for proposed number of Hubs working in the network	Actual Hubs working in network per year
2009	12	12	12
2010	40	36	25 (11 from 2009; 14 new 2010)
2011	60	60	38 (24 from 2010, 14 new 2011)
2012	60	60	
2013	60	60	

SSLC recruitment of the 2010 Hubs was by application. There was a stated focus on recruiting schools in urban areas, or those schools that were servicing the needs of Indigenous students who were a minority within the full school student cohort. This decision was based on the fact that the majority of Indigenous students nationally attend schools where they are a relatively small percentage of the overall student cohort. This focus is evident in the selection of the 2010 Hub schools. The criteria the schools were required to demonstrate included:

- Successful completion of SSLP;
- Demonstrated success in Indigenous community engagement;
- Evidence of improved rates of Indigenous student attendance;
- Evidence of improved student achievement and outcomes;
- Capacity to sustain own school reforms and willingness to assist other schools to initiate similar reforms;
- Preparedness to be involved in a national network of schools subject to an independent evaluation;
- Accorded a high-priority recommendation by the SSLC Advisory Committee, especially by the representative of their State/territory schooling authority; and
- Formally ratified via a decision of the SSLC Project Board, having regard for the overall project design, and for maintaining an appropriate mix of schools, locations and community characteristics.

(Stronger Smarter Institute, 2010a, p.1)

A stronger set of explicit agreements, responsibilities and accountabilities were proposed. New and continuing Hub Schools also had to agree to the following:

- Participate and engage in planned [Network] communication activities;
- Contribute to sharing strategies;
- Demonstrate Hub/Affiliate communication;
- Send a representative to the national forum for Hub Schools;
- Commit to having a representative participate in two virtual/phone conferences during the year; and
- Participate in at least one other national network activity/event

(2010 Hub Leaders' Forum, Field Notes).

In 2010 the focus of SSLC shifted from establishment of a core group towards growth and expansion. This required new plans for communication between SSLC staff and the 25 Hubs that now formed the SSLC National Network. Monthly teleconferences, a bulletin, articles placed in the SSI newsletter highlighting SSLC activities, and the exchange of relevant books and research reports activities were implemented. The teleconference format began informally with the 2009 group. With the addition of new participants, plans were formulated to shift the format to encourage greater participation across a larger group.

SSLC operates separately from SSLP. In 2010, SSLC staff made bids to gain expanded access to SSLP participants during the residential program, and to increase participants' access to educational leadership and school reform materials and contents in SSLP. These changes did not eventuate.

In August 2010 the SSLC team held the first Hub Leaders' Forum in Brisbane. This forum was billed as an opportunity to set agendas for the project. Topics included: the future of SSLC, growth and sustainability of the network and minimum requirements for inclusion as a SSLC Hub. The second day provided opportunities for revisiting key Stronger Smarter messages and for SSLC Hub leaders to be updated on research activities. A new format for teleconferences was discussed, with SSLC Hub leaders to take leading roles. There was an attempt to refocus the group on case studies to be produced at each school as a way to disseminate stories of success. The opportunity for SSLC Hub Leaders and others to participate in MEd study at QUT was also discussed.

The 2010 Hub Leaders' Forum concluded with Dr. Sarra and the SSLC staff calling for a shift beyond the Cherbourg story. Leaders were encouraged to produce case studies and stories that would replace the Cherbourg story. Dr. Sarra stated "SSLC has grown legs and taken off...the place where you are all at is now the main game" (2010 Hub Leaders' Forum, Field Notes). The Forum concluded with several school leaders calling on SSLP's "Engoori" process (Gorringe, 2008) as a means to take responsibility for the progress of the Stronger Smarter messages and the growth of SSLC.

In October 2010, there was a change in personnel of SSLC. The Research Manager resigned and was replaced. The position's responsibility was to liaise between SSLC and the research team, to monitor implementation of the Project Implementation Plan, and to manage liaison with 2010/2011 Regional Partner Research Teams (hereafter, RPRTs) and IERG. As of August 2011 this position is vacant.

In 2011, the format for teleconferences has changed. They now involve the provision of expert input from policy makers, SSI and SSLC staff, Hub leaders, and the research team on a particular topic. Prior reading is often provided to participants. These teleconferences are not dialogic; SSLC Leaders are given the opportunity to discuss the set issue in on-line discussion forums after the teleconference. Participation in online discussions has thus far been minimal, but participation in the teleconferences continues to be high.

In March 2011, IRG and IERG held joint meetings in Brisbane. Preliminary data for this report was tabled and discussed. IRG and IERG recommended modification of the original design to include a purposive sampling for qualitative cases to emphasise Hub and non-SSLC schools with demonstrable success; renaming of the construct of 'Aboriginal identity' on instrumentation to accommodate the original wording of the SSLC messages. They also called for a robust debate about the definition and positioning of 'Aboriginal Identities' in SSLP and SSLC. A decision was made to develop the complementary study which would be exclusively designed and conducted by Indigenous researchers to document Indigenous community, students' and teachers' views (see Appendix 2.4 for further details around the Complementary Study).

IRG and IERG recommended that SSLC focus on consolidation of current operations and Hubs and a reconsideration of expansion plans. The Research Manager announced plans for the completion and publication of 60 "stories of success" by the end of 2011. The Network Coordinator announced pending links between SSLC and State systems as a way to provide growth and sustainability to the project, and also as a way to respond to new funding contexts such as the National Partnership agreements. The engagement with state systems is to lead to the establishment of other, more regionalised criteria for the selection of Hubs and Affiliates.

Fourteen new Hub schools have joined in 2011, bringing the total number to 38. SSLC leaders and staff are at present considering what this expansion will mean for the Network, network communications and support.

Currently, SSLC has negotiated agreements with state systems in South Australia, Western Australia, Northern Territory, Victoria, New South Wales and Queensland for the selection and support of regional Hubs. Tasmania and Australian Capital Territory are yet to sign agreements but continue to participate. At the March 2011 meeting with IERG and the IRG, these state agreements were announced – and an operational plan for 2011 was tabled. Plans for a designated SSI/SSLC Network coordinator in each jurisdiction commenced in 2011.

2.1.1 SSLC Hub School and Capacity Building Grants

There are two grants available to SSLC schools as part of their participation in the project. The first is the SSLC Hub School Grant, which is provided according to a formula based on student numbers to all SSLC participants on entry to the project. The second are Capacity Building Grants, which require application from established Hub schools.

2.1.2 Hub School Grants

Hub School Grants are intended to "grow and sustain positive outcomes" in the SSLC Hub school and "facilitate reform and renewal processes" (Indigenous Education Leadership Institute, 2009, p.8) in the Affiliated Schools. Schools provide details of how the grant will be used and indicate the proposed benefits for the Hub site and its Affiliates via the completion of two documents. The first is the original application to be formally designated as a Stronger Smarter Learning Communities Hub. The second document is a formal proposal outlining the intended strategies for working with affiliated schools. A budget is also required.

The application document provides brief outlines of the school context inclusive of current enrolment data; of the community context (especially of its Indigenous communities); brief details of the Indigenous education experience of the principal and key staff members. Evidence of participation of the school and/or community leaders in the SSLP and a brief outline of the school's goals and philosophy and its programs for generating success in Indigenous education are also expected. An overview of data to support the application on the following four criteria is also required:

- Evidence of successful engagement of parent and community members in the school;
- Evidence of improved school attendance;
- Evidence of improved student performance, as measured by using NAPLAN data for Years 3, 5, 7 & 9; and
- Preparedness to grow and sustain positive outcomes in the SSLC Hub, and to facilitate reform and renewal processes in 3-4 Affiliates.

The proposal includes a brief statement of the purpose and objectives of a plan to operate as an SSLC; contact details of the school and the principal for the Hub school and Affiliates; identification of high-priority objectives (i.e. five key themes or meta-strategies) for the strategies to be adopted in the Hub and in each of the Affiliates plus the inclusion of a proposed budget for use of the SSLC funds in achieving these objectives.

The application process continues to evolve each year and in 2011 the requirements for application were modified and formalised to include the completion of an additional document. The schools are still required to complete a form to indicate the change agenda priorities or learning communities plan (HS1A) and an additional document (HS1B) that requires Hub schools and Affiliates to outline their shared targets and performance indicators for their common priorities. Schools are also asked to identify people who have demonstrated "something they have done or are doing that is having a positive impact on outcomes for Indigenous students" (SSI, 2011a, p. 1).

The budget is developed collaboratively with the Affiliates. The School Grants designated to the SSLC Hub schools range from $9000 (for small schools with an enrolment <150 students located in a city or town and with a low percentage of Indigenous students) to $15000 (for large schools with an enrolment > 900 students located in remote communities and with a high percentage of Indigenous students). Payment of this grant is recorded as being dependent on provision of official invoices from the Hub school: up to 70% to be paid on the basis of a plan to meet designated priorities and 30% on provision of a summary report on the extent of achievements to date with respect to the stated action plan and of the effectiveness of the priority strategies within the plan. The total allocated funds for Hub School Grants for 2010 was $294000 (See Table 2.2).

Table 2. 2 Makeup of Allocated Funding for 2010

	Funding Makeup	Number of Schools	Funding	Special Circumstance *	Total Funding
A	$9,000	7	$63,000		$63,000
B	$11,000	5	$55,000		$55,000
C	$12,000 2 special circumstance schools	10	$120,000	2000	$122,000
D	$13,000 1 special circumstance schools	3	$39,000	1000	$40,000
E	$14,000	1	$14,000		$14,000
Total			$291,000	$3,000	$294,000

* Additional provided for remoteness and/or number of Indigenous students

2.1.3 School Community Capacity Building Competitive Grants

The intended purpose of the School Community Capacity Building Grants is to "encourage innovative strategies for building capacity of the Hub schools as learning communities" (Indigenous Education Leadership Institute, 2009, p.9). SSLC Hub schools are invited to submit proposals. Each proposal includes: a brief purpose statement of the proposed strategy with reference to the high-priority SSLC objectives (meta-strategies); evidence-based identification of specific school community issues to be addressed; a rationale for the adopted approach to community capacity building and inclusion of a budget for the use of the project funds to achieve the objectives. The amount granted to successful proposals ranges from $10000 to $15000 and is made on a joint funding basis of 2:1 allocation such that if the SSLC Hub has submitted a plan for a project costed at $15000 and is successful the SSLC Hub will receive $10000. SSLC Hub schools need to be explicit about the source of the other funds. Any unallocated funds carry over to the next year's Capacity Grant budget when more SSLC Hubs have an opportunity to compete for these funds. Payment is made on the provision of official invoices from the Hub school: 70% is paid on the basis of the proposal, as stipulated, to meet the project priorities with 30% paid on provision of a summary report of achievements as stated in the plan.

To date five schools have been allocated funds out of the Capacity Building Grant scheme. Schools who received capacity grants received between $5000 and $15000. Table 2.3 details a summary of the Capacity Building Grants allocated in 2010 and 2011.

Table 2. 3 Capacity Building Grant Applications/Allocations 2010-2011

Grant	Year Allocation	Description
500	2010	This school together with its affiliated schools indicated plans to work with NAPLAN data, build community engagement, develop an existing Indigenous program and build Indigenous community relationships which required further support and guidance.
1700	2011	This school indicated plans to embed local Indigenous knowledge, culture and understandings into the culture of the SSLC schools in the region.
1900	2011	The plan reported an effort to engage community through the first Junior Land Council in partnership between the school and the Local Land Council. Elders, the community, the teachers and peers support the junior version, of a traditional committee model that includes both Aboriginal and non-Aboriginal students.
1500	2011	The application presented a plan to develop Indigenous leadership through support of the National Aboriginal and Torres Strait Islander Principals' Association. The aim of this project is to increase the visibility of Indigenous peoples in the schools involved and especially in school leadership positions.
3400	2011	The aim of this plan was to nurture a positive sense of Indigenous identity to promote both cultural strength and learning success. This Hub school and Affiliates aim to consult with local community members to identify community protocols, collect ideas and resources to collectively plan Cultural Celebration Days.

A second round of grants is to be awarded in November 2011. Capacity building grant allocations will be confirmed and compliance monitored by November 25th 2011.

2.2 Regional Partner Research Teams

"Guaranteed access to research support staff to assist Leaders in meeting their documenting and reporting commitments" was proposed in the Project Implementation Plan (Indigenous Education Leadership Institute, 2009, p.2). In addition:

Commissioned research teams from Australian universities and other research agencies will be selected by tender and formally invited through the Project Board to coordinate the development and delivery of Component 2 qualitative case studies in specific regional areas and/or within specific states and territories.

(Indigenous Education Leadership Institute, 2009, p.25-26)

SSLC staff discussed whether the proposed support was for the research (i.e., "component qualitative case studies") or for school level narrative documentation of reform. The final version of the responsibilities of these teams was outlined in QUT tender documents:

1. Obtain relevant ethical clearances and permissions for all research activities to be conducted;
2. Work with schedules, protocols and templates as supplied by the SSLC Research Team with fidelity;
3. Work with the 4 – 5 designated SSLC Hubs and Indigenous community representatives to collect, compile and analyse relevant data for their stories of renewal and reform;
4. In order to prepare a set of case study reports of each hub's story of renewal and reform – both within their school community and beyond via links with their affiliate school communities;
5. Promote successful networks and communication within and across the regional network of 4 – 5 designated SSLC Hubs;
6. Identify local innovative practices for dissemination within the national network;
7. Work with schools and communities in ways that are respectful, consultative and ethical, especially by following guidelines for ethical conduct of research with Indigenous peoples; and
8. Deliver milestones on time and respond to feedback and suggestions as appropriate.

(Stronger Smarter Institute, 2010b).

This marked a change from the original Project Implementation Plan. The intention by SSLC was to provide additional regional support to the documentation of school reform and innovation.

In February 2010, the SSLC team conducted one day forums in Brisbane, Newcastle, Darwin and Perth. The forums provided information to Hub candidate schools, and information to researchers tendering for RPRT. After a tender and review process in June, 2010, five Regional Partner Research Teams were appointed and contracted to work with groups of schools in Hunter (Team A), Brisbane/SE Queensland (Team B), North Queensland (Team C), NT, Kimberley (Team D), and North and Western NSW (Team E). Funding was allocated to these teams with targets for delivery in 2011.

A three-day training session was organised for the successful RPRT teams in July, 2010, by SSLP staff (the Research Manager at the time) with the research team and participation from the IERG Chair. The SSLC Research Manager took responsibility for monitoring procedures and deliverables on the RPRT, specifically for refereeing by the research team and IERG prior to delivery to the Project Committee and DEEWR. In 2010, RPRT start-up was delayed by contract finalisation and other administrative issues.

The original timelines for RPRT deliverables were tight and advice was provided to the SSLC team that delays were likely. Table 2.4 below provides the original Schedule of Completion provided to applicants in the *Request for Offer* documents.

Table 2.4 Schedule of Completion for RPRTs in 2010 round of applications

Timing	Key milestones and deliverables
21 April 2010	• Request for Tender advertised and/or mailed following expressions of interest
5 May 2010	• Final Request for Additional Information
21 May 2010	• Tenders Close 2:00pm AEST
2 June 2010	• Tenders Awarded • Jurisdictions advised
7 June 2010	• Contact with Senior Research Manager, Stronger Smarter Institute to discuss: role and responsibilities training needs, SSLC Hub and Affiliate links • Contact with Research Team to discuss: ethics, schedules, materials
28 June 2010	• Contact with Hub school community leaders to discuss: regional network communication and planning for research visits.
30 September 2010	• Proof of appropriate ethical approvals • Plan and schedule for data collection at each hub negotiated with Hub school staff and community members as appropriate for each site • Schedule of communication and proposed networking for regional area network • Identification of local practices of potential interest to others on the national network
28 February 2011	• Data collection (see case study template summary in Appendix 2.5 for further details) • Records of communication and networking for regional area network • Description of any relevant best practice features for dissemination
29 April 2011	• Draft case studies of all Hubs submitted for feedback
29 July 2011	• Final case studies of all Hubs completed, incorporating feedback

These dates have not been met, with renegotiations occurring several times. In the first instance these renegotiations were necessitated by the late provision of contracts to the teams. In April 2011 the following renegotiation of dates was organised by the then Research Manager. Table 2.5 provides a summary of these new deliverable dates. Note Team D dates are not recorded here because they were not provided to the Evaluation team (not because Team D were not close to completion).

Table 2.5 Rescheduled Dates for Draft Case Studies – SSLC RPRT

RPRT	New expected delivery date	Explanation/Update
Team C	Late June to early July	Case studies are in draft form. Team is currently (term 2) in the process of meeting with Community members at each location to discuss drafts. It is likely that Ingham case Study will be late due to natural disasters that have occurred at this location.
Team B	Draft August 8th Final October 17th	Team confident that these dates are achievable.
Team D	New dates not yet negotiated.	
Team A	Draft cases ready by July 31	

To date, 2010 RPRT reports and case studies have yet to be submitted. SSLC staff are developing a proposal to replace the original RPRT structure with new provision for regional support teams beginning in 2012. As of 31 July 2011, the RPRT projects have not delivered draft reports for consideration by IERG, the research team or the Project Committee.

The SSI website (http://www.strongersmarter.qut.edu.au/stories/index.jsp) lists 14 single page selected case narratives of schools, including some current SSLC Hubs and non-SSLC Schools. These are the exemplars and models presented by SSLC to participating schools to date.

2.3 Contextual Background: The Stronger Smarter Leadership Program

The Stronger Smarter Leadership Program (SSLP) is technically a separate entity from SSLC. Both SSLC and SSLP are managed by the SSI under QUT administrative structures, but they have separate roles, staffing, funding sources, accountabilities and aims.

The present evaluation asks about the efficacy, effects and sustainability of SSLC. However, SSLP is the *defacto* core training component of SSLC and the major source of its educational and programmatic contents. SSLP also is the explicit focus of Research Question (1) in the *Project Implementation Program* above: to evaluate the influence of SSLP in "generating and sustaining" school reform and improved Indigenous student outcomes in SSLC schools.

Hub principals and/or key school and community leaders who complete SSLP may apply or be invited to apply for SSLC on behalf of their schools. 2010 and 2011 Hubs were selected in part on the basis of whether their leaders attended SSLP. Reciprocally, Hubs and Affiliates are encouraged and offered scholarship grants by SSI to attend SSLP. Current systemic agreements with Hub schools will require SSLP participation by leaders and/or staff.

Because (1) selected SSLP participants flow to SSLC, (2) SSLP participation is required for Hub leaders, and reflexively (3) SSLC schools are encouraged or provided with incentives to send staff to SSLP, in this report SSLP is taken as a *defacto* ‘treatment’ factor for SSLC schools, and a key input that differentiates them from non-SSLC schools.

SSLP sets out to influence school leadership and reform by transmitting the Stronger Smarter themes. It aims to transform the individual sensibilities of school leaders, and return them to the school to implement, prioritise and integrate these messages into school operations. Except where altered through principals’ transfer, all current Hubs have leaders or key staff who have attended SSLP.

This report is *not* an evaluation of SSLP. In fact, because a majority of 2009-2011 participants of SSLP do not subsequently participate in SSLC, and because we were unable to contact the estimated 170 2005-2009 SSLP participants, only a minority of whom have ongoing involvement with SSLC - we have no way of gauging the spectrum of uptake or effects of SSLP on a representative sample of participants. The Independent Research consultants Clear Horizon (2009) undertook a research evaluation report of SSLP for SSI in 2009, mainly narrative and qualitative, which was submitted to DEEWR.

However the current report gauges the relative impacts of SSLP as the main ‘treatment’ for SSLC school leaders and staff on school practices and outcomes. A descriptive overview of SSLP follows. This is based on written materials, readings and course documentation provided by SSLP to the research team and to the QUT Faculty of Education; and on participant observation by two members of the research team in one full week-long SSLP training session and subsequent return sessions of two days in 2010.

As of 2011 SSLP is a proposed component of a new Masters Study Area in leadership at QUT. The Institute provides a regionally developed and deployed version of SSLP, while continuing to offer a national version of SSLP.

2.3.1 Program Development

According to current SSLP materials and advertising, SSLP is a minimum 12-month commitment and requires commitment to two face-to-face forums and all program components:

Phase 1 **Stronger Smarter leadership development forum** focusing on enhancing collaborative and cultural competence and leadership capacity to facilitate change, engage Indigenous community and transform learning contexts.

Phase 2 **Taking the message back**: workplace engagement and cultural planning phase, focusing on discussions, consultation and planning.

Phase 3 **Leadership for School Transformation forum:** workplace challenges and school transformation plans are shared, reviewed and discussed by participants and the Stronger Smarter team.

Phase 4 **Transforming workplaces** implementation, online discussion and for a supporting school transformation.

Phase 5 **Acknowledging and celebrating learning,** case study and/or action research on school transformation plans and positive student outcomes.

(Stronger Smarter Institute, 2011b)

Not all participants stay connected for a 12-month period after the initial week long program. Exact figures and data on cohort participation, follow-up and response back to 2006 are not available. However, the majority of participants engage until Phase 3, returning for a two-day forum to share experiences. This typically occurs two months after the original program. Some participants stay connected with Stronger Smarter staff and processes until Phase 5. These participants may present their reform work at SSI forums or network activities. This level of participation may lead to SSLC participation.

SSLP aims to encourage participants to work toward achieving four key objectives:

1. Build a critical mass of educational leaders creating positive changes in Indigenous education throughout Australia.

2. Promote the improved student learning outcomes brought about by educational leaders and their schools.

3. Create a sustainable attitude and belief about the ability of Indigenous students, their teachers and communities to achieve outstanding results through quality education.

4. Use technology for the dissemination of positive stories.

(SSI, n. d., p. 3)

Participants are provided with opportunities to:

- Challenge their assumptions about school beliefs and practices in order to improve outcomes for Indigenous students;
- Support the process of school transformation in their own context to improve Indigenous student outcomes; and
- Engage in action research and document progress and learnings.

(Field notes, SSLP participation, August 2010)

The three main components of SSLP are:

1. The Forums that impart knowledge and skills (Phases 1 and 3);

2. The Challenges that allow participants to enact their learning (Phases 2 & 4); and

3. The Dissemination process that documents and shares insights within and across participant cohorts (Phases 3 & 5).

2.3.2 Program Structure

When SSLP was first developed in 2006, participants took part in a week-long, residential program. There they were asked to engage in personal and professional self-reflection on their beliefs about Indigenous communities, students and education. These beliefs were challenged by exposure to local, Indigenous people; to the five Stronger Smarter strategies;

and to “hard conversations” about negative stereotypes, family life in some Indigenous students’ homes, and the impact of deficit perspectives on Indigenous student learning.

Following the week-long residential program, participants were asked to return to their schools to share their experiences and “take the message back” with the goal of developing a “school transformation plan”: a case study or action research project that would employ Stronger Smarter strategies to improve Indigenous outcomes. Participants committed to an additional three days to come back together with their SSLP workshop group to discuss their school transformation plans with the larger group, to share any challenges they had faced in their schools. Returning to their schools for a second time, they are encouraged to continue to develop their plans as part of their SSLP experiences with online or face-to-face support or opt for no further participation with Stronger Smarter.

Since 2006, SSLP has been developed and refined by SSI staff. The format is now referred to as the “National SSLP” with participants travelling from across Australia to attend workshops in Queensland locations like Brisbane, Cherbourg, and Tully. Since 2009, a regional SSLP format has been developed in a variety of locations (e.g., Kimberley, Hunter Central, Western NSW). This allows participants to come together in two, three-day SSLP workshops tailored to their particular area. Regional SSLP participants are also required to return for a two-day follow-up session.

2.3.3 Program Cost

As of 2011, participation in SSLP costs $6 500 per person. This includes accommodation, meals, and program materials during the residential components. It does not include travel or the relief or replacement costs for staff during participation in the program. From Telstra Foundation and Sidney Myer Fund support, participants can attend SSLP for a subsidized fee of $2 700 plus GST per person. Additionally full scholarships are available for Indigenous staff and Indigenous community leaders through the Jobs Australia Foundation support.

2.3.4 Program Content

The SSLP leadership training model draws on psycho-social and social psychological leadership development theory, which emphasises self-reflection on personal values; analysis of personality types and leadership styles; investigation of the relationship between leadership and organizational culture; and the transformation of organisational cultures through collaborative goal setting and values articulation (cf., Bass, 1990; Covey, 1990; Schein, 1985). The framework centres on the concept of *cultural competence*, and asserts that leadership comes through both the development of a set of knowledge and skills acquired through deep reflection on personal and organisational culture and a process of identifying shared values and behaviours. Cultural analysis involving an appreciation of different world-views and difference in Indigenous leadership are facilitated in the program. The organizational cultural analyses are grounded in the work of Gorringe and Spillman (2008). Participants are encouraged to bridge their personal reflection and professional learning and action.

SSLP draws on a wide-ranging set of philosophies, content, and activities. These include Eastern philosophies about change, citing Gandhi and Buddhism; Australian Indigenous perspectives on leadership and culture from Sarra (2003, 2008), Davis and Grose (2008), Gorringe (2008) and Gorringe and Spillman, (2008); and interactional and organizational theory (Griffin & Stacey, 2005).

Group awareness methods such as ‘setting the circle’ and the ‘thumbometer’ are used to gauge participants’ levels of engagement with activities. The Engoori Process that Gorringe (2008) introduces into the SSLP processes is based on a concept from his land, the Mithaka peoples of South West Queensland. It is documented as: “a cross-generational way of people working together, grounded in collective identities, to create and achieve their own sustainable environments” (Imagine Consulting Group International Pty Ltd, n.d., p.1).

SSLP work has a strong anti-racist component (cf. Jones, 2000; Paradies, 2005), and is not designed to foster competence in any particular Indigenous cultural context. A significant aspect of SSLP involves exposing participants to a range of negative stereotypes and deficit understandings about Indigenous peoples (Sarra, 2005) as part of a consciousness-raising approach. As an intervention it targets individual change rather than sociological or structural economic analysis of racism, society and schooling.

2.4 Overview of the Research Design

2.4.1 Research Questions and Data Sets

The research program has five core research questions listed in the *Project Implementation Plan.* These are cited here, noting specific data sets that are used to address each question.

1. How influential is school leaders’ participation in the SSLP in generating and sustaining school reforms and community engagement in the SSLC Hubs, and improved outcomes for Indigenous students? (Leaders’ and teachers’ survey self-report data; qualitative case studies; multilevel modeling of school achievement and attendance).

2. Do SSLC Hubs across the national network have value-adding influence and impacts on their Affiliated Schools? (Multilevel reanalysis of systemic achievement and attendance data).

3. Do SSLC Hubs and their Affiliated Schools function as learning communities with sustainable kinds and levels of community engagement? (Leaders’ and teachers’ survey self-report data; qualitative case studies; social network analyses of leaders’ communications patterns; complementary qualitative study of Indigenous community).

4. What other systemic, community, cultural and linguistic, school, teacher, and classroom factors impact on school renewal and reform, community engagement and improved Indigenous student outcomes? (Multilevel modelling of systemic data, survey data; qualitative case study data; complementary qualitative study of Indigenous community).

5. How scalable and sustainable is the Stronger Smarter approach to school renewal and reform in Indigenous education? (survey data; longitudinal ‘value-adding’ analysis of systemic achievement attendance and achievement data; and qualitative case study).

This original design is documented in the Project Implementation Plan. It is a four-year, mixed methods study that gathers qualitative and quantitative data to address each of the research questions. This 2011 research report attempts to document through survey self-report, interview and narrative case studies the ‘uptake’, interpretation and use, effects and impact of Stronger Smarter messages in Hub and Affiliate schools in the following two steps.

1. This report documents leaders’ and teachers’ self-reported views on Stronger Smarter messages, and their views on how they have or have not translated these into changes in school administrative, pedagogy/curriculum practices. This is done through qualitative field work undertaken in a purposive sample of Hubs, and through survey instruments of a larger sample of Hubs, Affiliates and non-SSLC schools. These documented and measured school leaders’ and teachers’ engagement with constructs based on the core Stronger Smarter messages; and they document and measure other demographic, school and community factors that appear to influence the uptake of messages.

2. Systemic school level and student data on conventional achievement indicators is used to measure whether schools with variable uptakes of Stronger Smarter messages have differential patterns of growth in attendance and achievement on conventional measures.

In this way the core question about the efficacy of SSLC and, more generally, the effectiveness of Stronger Smarter strategies in mediating student outcomes can be answered. To explain other variable factors influencing efficacy, scalability and sustainability - qualitative case work and social network analysis of communication across the network is undertaken. In 2012, the planned complementary study will document Indigenous community, student and teacher uptake. In 2013, a summative evaluation of educational outcomes, cost-benefits, scalability and sustainability in relation to national policy goals will be provided.

2.4.2 Design Changes

Revisions to the original design have been made. This is in response to changes in the structure and operations of SSLC, and in response to specific feedback from SSLC staff, IRG and IERG. Design alterations have been documented for the Project Committee and DEEWR in regular reports. These include:

1. An explicit focus in survey and qualitative data collection on Indigenous community views and engagement (4/10);

2. An explicit focus in qualitative data collection on Indigenous student views (4/10);

3. An explicit focus on pedagogy/curriculum as factors influencing student outcomes (4/10);

4. The addition of a social network analysis of school leaders’ communications and contacts (4/10);

5. An explicit focus on school to work/further education pathways (4/10);

6. A shift in the purpose of the 2010 RPRT from that of qualitative data collection to documentation and support of school reform and success reporting directly to SSLC (6/10);

7. The shift in criteria of qualitative case study selection from broad to a purposive sample of emphasise schools that are generating improved results (3/11); and

8. The addition of a major complementary study of Aboriginal and Torres Strait Islander community members to be undertaken by Indigenous researchers of the research team with members of IERG (6/11).

2.4.3 Research Milestones to Date

Completed for this report in 2010/2011 are:

1. Ethics clearances from all relevant state, school and community jurisdictions (2010-ongoing) (see Appendix 2.3);

2. Data releases of individual student achievement and attendance data from all states (except, NSW) (2010-ongoing) (see Appendix 2.2);

3. The development, trialling and administration of a leaders survey for SSLC Hub and Non-SSLC school principals and school leaders (4-12/2010);

4. The development, trialling and administration of a teachers' survey for SSLC Hub and Non-SSLC school teachers (6-12/2010);

5. Descriptive, multivariate and multilevel analysis of leaders and teachers' survey data (1/11-ongoing);

6. Multilevel 'value-adding' analysis of all available school-level achievement and attendance data (2011-ongoing);

7. Network analysis of the school leaders' contacts in six Hub/Affiliate clusters (2/11-ongoing) (see Appendix 2.6); and

8. Field-visits and case studies of ten Phase 1 Hub schools documenting the uptake of Stronger Smarter messages, school reform and local issues (10/10-ongoing).

Projected work program for 2011-2012 includes:

1. Re-administration of all teachers' and leaders' surveys to Hubs, Affiliates and non-SSLC schools (8-12/11);

2. Requests to state systems and statutory bodies on student pathways data (e.g., matriculation, further education, employment) from Hub and non-SSLC schools (8/11);

3. Expansion of the network analysis to cover 45 selected schools (8-11/11);

4. Complementary field visits and case studies of Indigenous community, student and teacher views in five selected schools by IERG and the research team (2/12);

5. Field-visits and case studies of ten 'Phase 2' Hub and two non-SSLC schools documenting changes in leadership, focusing on pedagogy/curriculum (2-4/12);

6. Longitudinal growth analysis of systemic school-level achievement and attendance data (1/12); and

7. Collection and multilevel analysis of individual student achievement and attendance data from Qld, SA, NT, WA, Vic and Tas (NSW did not provide this) (2011/2012).

This will enable a longitudinal study of those schools that entered SSLC in 2010; with cross sectional analysis of those schools that entered in 2011 and 2012. In 2013, the longitudinal component will be extended to 2011 Hub entries.

The report now turns to the case study design and research findings.

2.4.4 Design of Case Research

This section describes the structure of the case study analysis. Each Hub and its Affiliates is taken as a case within SSLC. Figure 2.2 represents the SSLC administrative structure. The number of Affiliates working within Hubs varies from one through to seven; typically, Hubs will work with two, three or four Affiliate Schools.

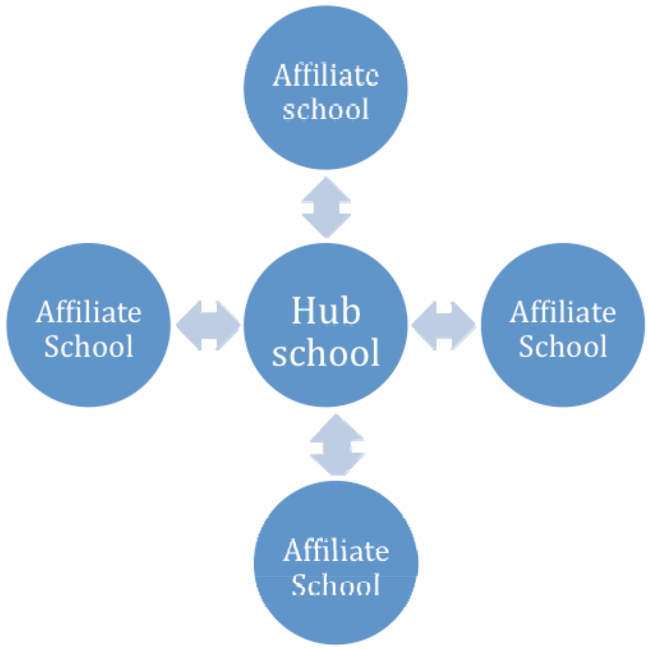

Figure 2. 2 A representation of the Hub structure as proposed by Stronger Smarter Learning Communities

The case design has progressed according to three phases as detailed in Table 2.6 below. In the *Trial, Consultation and Pilot Phase*, data collection schedules and protocols were designed by the team before consultation with IRG and IERG (10/2010) and SSLC staff. The protocols were trialled with like-participants who were not involved in SSLC, and a pilot field visit was conducted in one SSLC Hub School. Initial phone and meeting discussions were held with various Hub principals.

Table 2. 6 **Phases of the Case Design**

Time	Phase	Details of the Network	Details of data collection
September, 2009 to June 2010	Trial, consultation and pilot	**12** Hubs enter in 2009	Data collection schedules and protocols **designed, reviewed** by IERG, International Advisory panel, SSLC staff, and Indigenous education colleagues. Protocols t**rialled** with like-participants not involved in SSLC. **Pilot** of field visit conducted at 1 Hub school
August, 2010 to August 2011	Phase 1 Data Collection	**11** Hubs continue from 2009 cohort, and additional **14** Hubs begin – a total of **25** Hubs	Case profiles and case files set up and maintained for **25** Hubs Field Visits to **12** Hubs conducted.
August, 2011 to July 2012	Phase 2 Data Collection	**24** Hubs continue from 2010 cohort, and an additional **14** Hubs begin – a total of **38** Hubs	Case profiles and case files maintained and updated on **25** Hubs Brief Case profiles set up for **15** 2011 Hubs Return Field Visits to **10** selected Hubs and initial Field visits to **2** non-SSLC Schools

Phase 1 Data Collection

In August, 2010 the Case Research Team began two levels of data collection. Case files were set up for all 25 Hub Schools in the 2010 National Network. These comprised community descriptions, demographic details and histories, school demographic data, details of the schools' curriculum, policy and practices as represented on-line, and details of the school's relationship with SSI, SSLC and SSLP. The data was collected primarily from on-line sources including school websites, media outlets, community organisation web sites and the Australian Bureau of Statistics and ACARA sites. Case profiles of the 25 Hubs were then prepared from this data.

Twelve Hubs were identified for field visits. These visits were designed to allow for the case file data to be enhanced with additional data sets including: interview data of Leaders, Staff involved in teaching relationships with students (e.g., teachers, Indigenous Education Workers, School Learning Support Officers etc), Parents and Community Members and Students; artefacts; observations of classroom activities and school based initiatives.

The selection of the 12 Hub Schools for field visits in Phase 1 aimed at the representation of the diversity of 2009/2010 SSLC Hubs. The criteria used to select Hub Schools for field visits in Phase 1 were:

- School type (Primary, Secondary, Combined);
- Number of students (<100; 101-400; 401-1000; >1000);
- % Indigenous students (<10; >10);
- Location (metropolitan; provincial; remote; very remote);
- Time in SSLC (entered 2009; entered 2010).

There was an attempt to include schools across a variety of jurisdictions. Schools from ACT and Victoria were not included in the Phase 1 selection.

Phase 2 Data Collection

Phase 2 will proceed from August in 2011. The sampling procedure will focus on schools that have been identified as achieving success on conventional indicators, to ensure that the summative report contains exemplars of successful practice if more generalisable patterns of improvement are not available. Two additional schools with demonstrable success but not affiliated with SSLC will also be included in the new sample for comparative purposes. Following findings in the 2011 report, data collection will both update previous data collection where relevant, and will focus on field observations of curriculum and pedagogy, with new protocols to be developed in 10/2011.

In the sections that follow, the demographic trends of the 25 Hubs participating in 2010 are first presented. This data is also included for the 14 new 2011 Hub Schools so as to present the trends in the National Network as it continues to develop. Three case study reports of three Hub Schools are presented. These three cases studies have been purposively selected to represent key trends in the data – with three additional case studies to be undertaken this year. Findings are then discussed.

2.5 Overview of the Hub Schools

This section presents an overview of schools participating in the SSLC Network. It begins with a current list of all active Hub Schools and Affiliate Schools. It then describes patterns of Hub School participation.

Table 2. 7 2011 SSLC Hub School List with Demographic Details and Network Information

YEAR 2009					
Hub School	**Type**	**Locale**	**Enrolment (2009)**	**% Indigenous**	**Affiliate School(s)**
NEW SOUTH WALES					
1	Secondary (Year 7-12)	Metropolitan	1011	9%	2003 2002
2	Secondary (Year 7-12)	Metropolitan	857	10%	2101 2102

					2103
3	Secondary (Year 7-10)	Metropolitan	921	6%	1601 1602
4	Primary (K-Year 6)	Provincial	31	100%	1503 1504 1502 1505 1501
5	Primary (K-Year 6)	Provincial	236	39%	1701 1702 1703 1704
QUEENSLAND					
1	Secondary (Year 8-12)	Provincial	954	14%	101 103 102
2	Combined (PP-Year 12)	Very Remote	1220	63%	701
3	Secondary (Year 8-12)	Metropolitan	1238	6%	501 502 503 504
4	Primary (P-Year 7)	Provincial	173	99%	802 801 803 804
WESTERN AUSTRALIA					
1	Combined (K-Year 12)	Very Remote	529	79%	2403 2402 2401 2404
2	Primary (K-Year 7)	Provincial	81	98%	2501 2502 (2010)
3	Primary (K-Year 7)	Very Remote	21	100%	4101 4102
YEAR 2010					
Hub School	**Type**	**Locale**	**Enrolment (2010)**	**% Indigenous**	**Affiliate School(s)**
NEW SOUTH WALES					
1	Secondary (Year 10-12)	Metropolitan	726	9%	1405 1403 1404 1401 1402
2	Secondary (Year 7-12)	Provincial	448	15%	1902 1901
3	Secondary (Year 7-12)	Metropolitan	1000	12%	1801 1802 1803 1804
4	Combined (K-Year 12)	Provincial	245	24%	1301 1302 1303 1304
QUEENSLAND					
1	Secondary (Year 8-12)	Provincial	513	9%	301 302 303
2	Secondary (Year 8-12)	Metropolitan	724	12%	405 401 404 406 402 407
3	Primary (P-Year 7)	Metropolitan	390	8%	601

4	Secondary (Year 8-12)	Metropolitan	784	12%	202 201 203

NORTHERN TERRITORY					
1	Combined (P-Year 9)	Very Remote	154	100%	TBA
2	Combined (P-Year 12)	Very Remote	515	96%	2901 2902 2903 2904 2905 2906
VICTORIA					
3	Primary (P-Year 6)	Provincial	452	7%	3403 3401 3402 3404
4	Secondary (Year 7-12)	Provincial	1058	8%	3301 3305 3303 3304(M) 3302
TASMANIA					
1	Primary (K-Year 6)	Metropolitan	237	23%	3902 3901
SOUTH AUSTRALIA					
1	Primary (R-Year 7)	Provincial	174	58%	3602 3604 3603 3605
YEAR 2011					
Hub School	**Type**	**Locale**	**Enrolment (2010)**	**% Indigenous**	**Affiliate School(s)**
NEW SOUTH WALES					
1	Combined (P-Year 12)	Provincial	150	97%	2201
2	Primary (P-Year 6)	Provincial	552	22%	2301 2302
QUEENSLAND					
1	Combined (P-Year 12)	Metropolitan	2186	3%	901 902 903
2	Primary (PP-Year 7)	Provincial	179	100%	1001 1002
3	Secondary (Year 8-12)	Provincial	1025	13%	TBA
4	Secondary (Year 8-12)	Provincial	218	88%	TBA
WESTERN AUSTRALIA					
1	Primary (K-Year 7)	Provincial	345	22%	2601 2602
2	Primary (K-Year 7)	Provincial	371	36%	TBA
NORTHERN TERRITORY					
3	Combined (P-Year 12)	Very Remote	180	99%	3001
4	Combined (P-Year 11)	Very Remote	216	97%	TBA
VICTORIA					
1	Primary (P-Year 6)	Metropolitan	284	18%	TBA
SOUTH AUSTRALIA					
1	Combined (R-Year 12)	Very Remote	26	77%	3701 3702 3703 3704

2	Primary (R-Year 7)	Metropolitan	422	7%	TBA
AUSTRALIAN CAPITAL TERRITORY					
1	Primary (P-Year 6)	Metropolitan	534	6%	4001 4002

Details of student numbers were sourced from 2009 & 2010 MySchool Profiles, Australian Curriculum, Assessment, and Reporting Authority (ACARA).

2.5.1 Participation Patterns by Jurisdiction

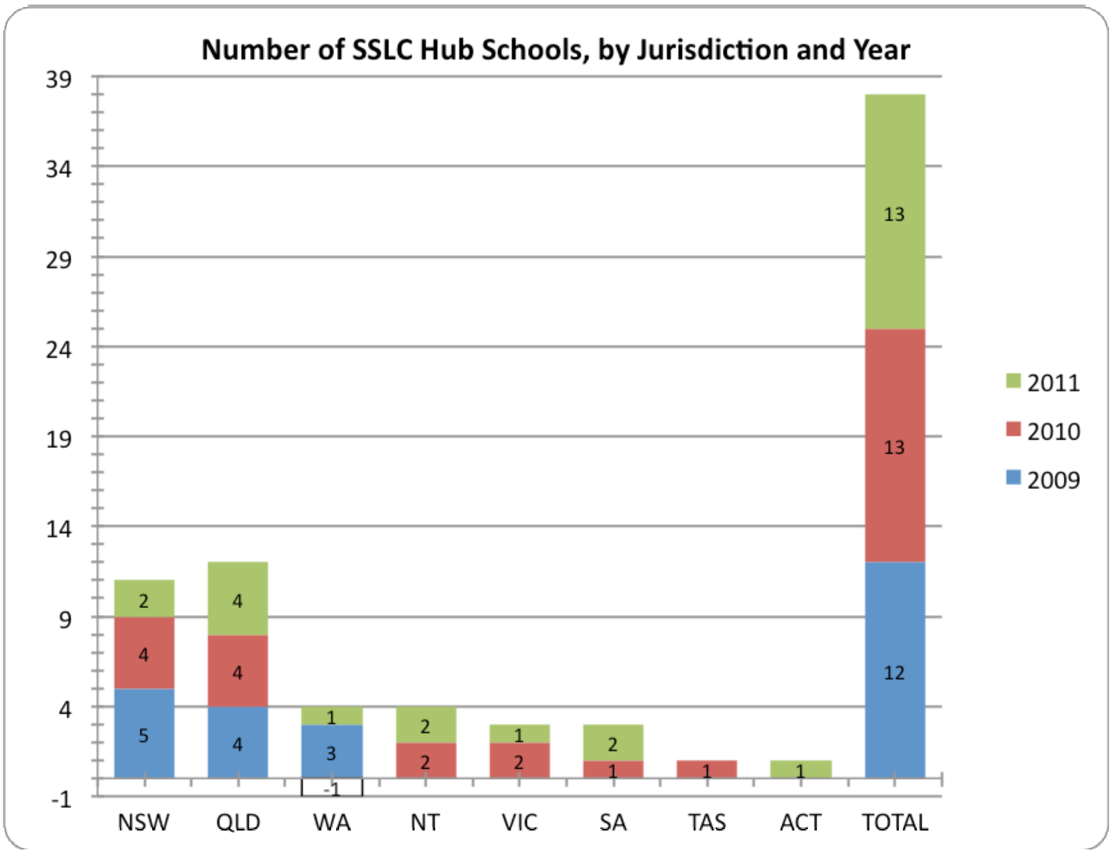

Figure 2. 3 **Participation levels by Jurisdiction**

In 2009, 12 Hub Schools participated in the SSLC Network from New South Wales, Queensland and Western Australia. In 2010, 14 additional schools became SSLC Hub Schools, expanding to include Northern Territory, Victoria, South Australia and Tasmania. One Western Australian school withdrew as a Hub School in 2010 due to principal transfer. In 2011, 14 new Hubs were selected, and one 2010 Hub shifted from a Hub school role to an Affiliate school role, bringing the total participating Hub Schools to 38 in 2011 (see Figure 2.3). All states and territories are now represented in SSLC with a strong presence in Queensland and New South Wales.

SSLC has made progress towards a fully national network, expanding from original bases in Queensland and NSW. There is still under-representation of participating schools in those jurisdictions other than New South Wales and Queensland with major percentages of Aboriginal students (South Australia, Western Australia, Northern Territory). State systemic agreements with South Australia, Western Australia and Northern Territory were announced in 2011 for Hub school enlistment with the aim to address the question of national scale.

Each jurisdiction has identified potential Hub schools and a suggested cohort for attendance to SSLP. The aim is for SSLC representation proportional to the percentages of Indigenous students.

2.5.2 Participation Patterns by School Type

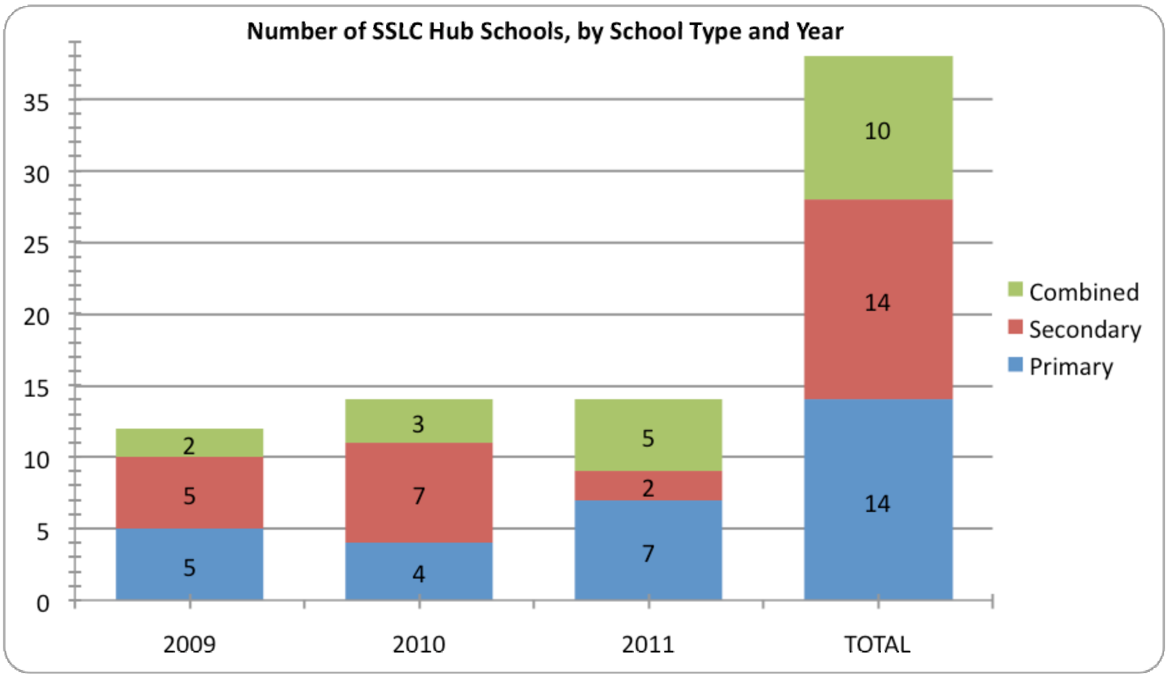

Figure 2. 4 **Number of SSLC Hub Schools, by School Type and Year**

The Hub Schools represent a range of primary, secondary and combined schools. The term "combined school" definition may conflict with ACARA listings, which tend to disaggregate combined schools as single campus entities.

In 2009 there were five primary Hubs, five secondary, and two combined. In 2010, four additional primary, seven additional secondary, and three additional combined schools joined the SSLC Network as Hub Schools while one primary school shifted from Hub to Affiliate status. In 2011, seven additional primary schools, two secondary schools, and five combined schools joined and again one primary school shifted from Hub to Affiliate status. Currently, there are 14 primary schools (37 percent), 14 secondary schools (37 percent), and ten combined schools (26 percent) participating as Hubs in the SSLC Network. (see Figure 2.4).

2.5.3 Participation Patterns by School Size

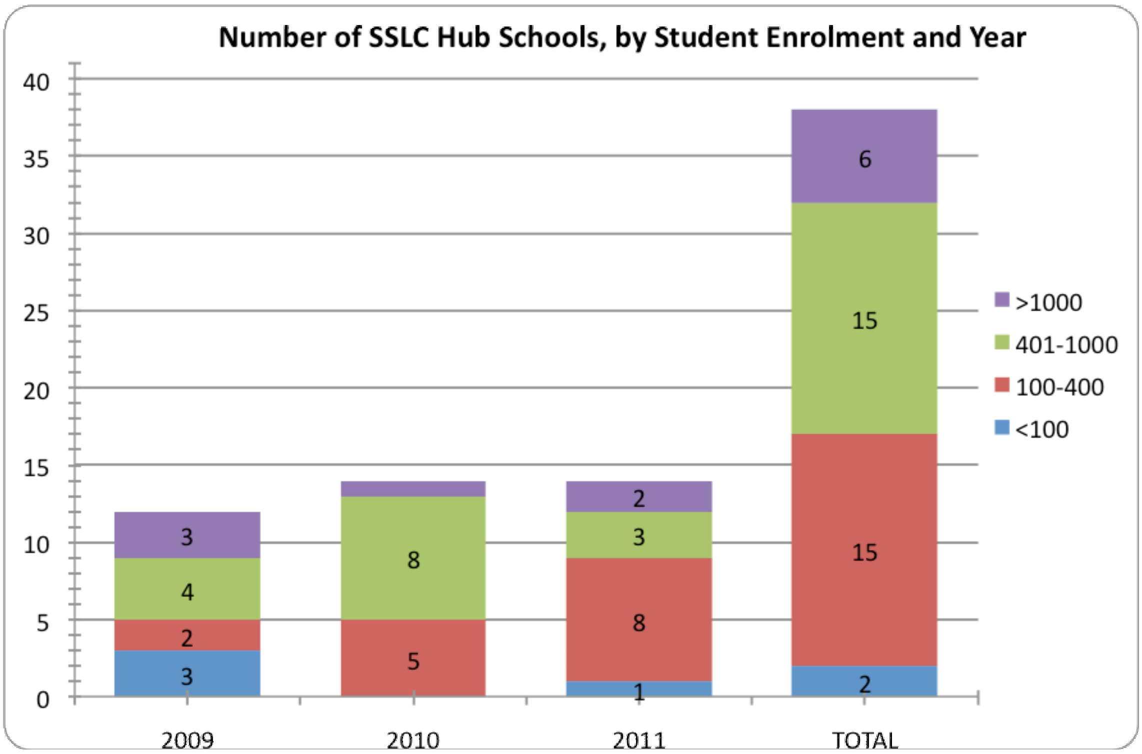

Figure 2. 5 Number of SSLC Hub Schools, by Student Enrolment and Year

Participating Hub Schools' enrolment range from very small rural primary with 24 students enrolled in 2010 to very large schools with over 1000 students. The largest Hub School, in Queensland, reported 2 186 students enrolled in 2010.

In 2009, three schools with fewer than 100 students participated in the SSLC Network as Hub Schools. There were two schools with between 100 and 400 students enrolled, four with between 401 and 1 000 students enrolled, and three with over 1 000 students enrolled. Currently there are a total of two schools with fewer than 100 students participating in the SSLC Network as Hub Schools, 15 schools with between 100 and 400 students, 15 schools with between 401 and 1 000 students, and six schools with more than 1 000 students (see Figure 2.5). **The greatest increase in SSLC Network participation over time can be seen in schools with enrolments between 100 and 400 students, followed closely by those with enrolments between 401 and 1000 students.**

2.5.4 Participation Patterns by Proportion of Indigenous Students

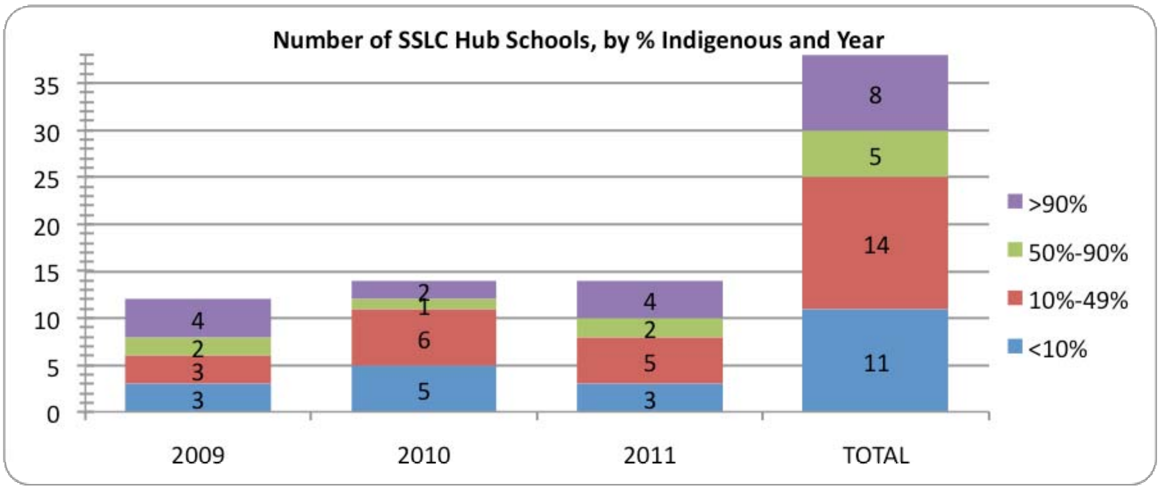

Figure 2. 6 Number of SSLC Hub Schools, by Percent Indigenous and Year

In 2009, three Hub Schools had less than 10 percent Indigenous student enrolment; three had between 10 and 49 percent Indigenous student enrolment; two had between 50 and 90 percent Indigenous student enrolment; and four had over 90 percent Indigenous student enrolment. There was, then, a relatively even spread of schools with varied percentages of Indigenous students.

Currently there are 11 Hub Schools with less than 10 percent Indigenous student enrolment; 14 have between 10 and 49 percent Indigenous student enrolment; five have between 50 and 90 percent Indigenous student enrolment; and eight have over 90 percent Indigenous student enrolment (see Figure 2.6). The two Hub schools that shifted to Affiliate status had over 90 percent Indigenous student enrolment. **The greatest increase in SSLC participation is in Hub Schools with between 10 and 49 percent Indigenous students enrolled.** This is consistent with the plan to target more schools over time with lower percentages of Indigenous students to address the fact that the majority of Indigenous students are enrolled in schools where they are a minority of the student cohort.

2.5.5 Participation Patterns by Location

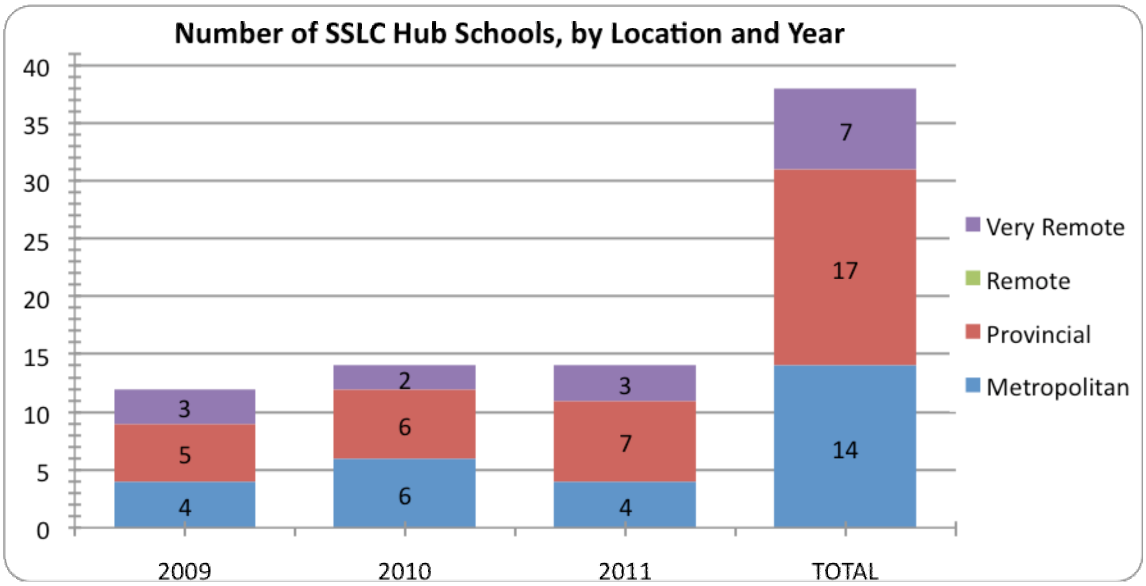

Figure 2. 7 Number of SSLC Hub Schools, by Location and Year

In 2009, four Hub Schools were classified as Metropolitan; five as Provincial; none as Remote, and three as Very Remote. Currently there are 14 Hub Schools classified as Metropolitan; 17 as Provincial; none as Remote, and seven as Very Remote (see **Figure 2.7**). One Hub school that shifted to Affiliate status was Provincial and the other Hub that shifted to Affiliate status was Remote. **The greatest increase in SSLC Network participation over time can be seen in Hub Schools classified as Metropolitan, followed by those classified as Provincial.** Again, this is consistent with the plan to target more schools over time with lower percentages of Indigenous students to address the fact that the majority of Indigenous students are enrolled in schools where they are a minority of the student cohort.

Phase 1 Case Selection

2010/2011 field work has focused on understanding what it means to be a SSLC Hub school at 12 particular sites. Table 2.8 below indicates the Phase 1 school sample. The table provides details of the representation of schools selected across the categories of school type, student population size, percent of Indigenous students, location and year of entry to SSLC. To protect anonymity, no jurisdictional details or school codes are included at this point.

Table 2. 8 Demographic details of the 12 Hub Schools selected for field visits in Phase 1

	School Type			Number of Students				% Indigenous		Location				Year of entry	
	P	S	C	<100	<400	<1000	>1000	<10%	>10%	MET	PRO	REM	VERY REM	2009	2010
1		X					X	X		X				X	
2	X			X					X		X			X	
3	X				X				X		X			X	
4		X				X			X		X			X	
5			X				X		X				X	X	
6		X					X	X		X				X	
7	X				X			X		X					X
8	X			X					X		X			X	
9			X			X			X				X	X	
10			X			X			X				X		X
11	X				X				X		X				X
12	X				X				X		X				X

To date, nine of the 12 field visits have been conducted. Field visits to the three additional selected schools will be conducted in August and September, 2011. The analysis here is based on the nine sites visited to date. Table 2.9 provides a short description of each of the nine Hub Schools visited to date.

Table 2. 9 Short description of the 9 Hub Schools visited to date (in Phase 1)

Description
A regional college in an urban location. The school has more than 2000 students with approximately 8% Indigenous students.
A small primary school located a short distance from a regional town. The school caters to 100% Indigenous students across Preschool to Year 6.
A public primary school in a regional area. The school has a population of approximately 350 with almost 40% Indigenous students.
A regional secondary school. The school has just under 1 000 students with just less than 15% Indigenous students.
A combined primary and secondary school. The school has almost 2 000 students and over 50% Indigenous students.
A secondary school in a satellite city to a State Capital. The school has just over 1000 students and 6% Indigenous students.
A primary school in a capital city. The school has over 350 students with 8% of those students identifying as Indigenous.
A small remote primary school with less than 100 students, 100% of whom are Indigenous.
A small school with over 500 students and approximately 80% Indigenous students

The Phase 1 analysis set out to document the shape and depth of the reform process, the local uptake of Stronger Smarter messages and translation of these into specific school practices. Our other focus has been on how Stronger Smarter messages stand in relation to other programs, approaches and philosophies in the school.

In the next section the case reports of three Hub School sites are presented to describe the range of uptakes of Stronger Smarter messages in Phase 1 Hubs. These are representative not exhaustive.

2.6 Three Case Reports

The three cases that follow provide descriptive examples of how particular Hub school sites are engaging with the up-take of SSLC.

2.6.1 Case Study of School 700

2.6.1.1 Case Introduction

School 700 is located in a large community of a remote region of Australia. Through an innovative school model this school is linked to other towns or communities located in the region. In the earlier stages of its involvement with SSLC there was a leadership transition.

The Stronger Smarter Institute (SSI) has featured this innovative model for school restructuring and reform, especially in relation to its employment strategies and guarantees made to parents and students about academic achievement. This school also plays a lead role in professional development for the region. Participation in the Stronger Smarter Leadership Program (SSLP) and the Stronger Smarter Learning Communities (SSLC) is reported to have influenced the culture of leadership, the emphasis on fostering local and Indigenous teaching and leadership capacity and the use of action research to inform staff knowledge about student learning and to set school priorities.

This school was in a period of transition in terms of leadership and in terms of orientation to reform. This period marked the end of a phase where the school was the focus of a series of reforms, beginning in the early 2000s with the “New Basics” curriculum approach, the introduction of approaches to explicit teaching of early reading during the same period. This site is unique insofar as: (1) it had been the site for successive curriculum and whole school reforms over several decades, some of it with strong community and local multinational corporate support; (2) it was transitioning from a period as a high profile ‘reform’ oriented school under an acknowledged leader in the field. The school’s participation and engagement with Stronger Smarter messages and ideas need to be placed in this context: a school that had been through a history of high profile ‘reform’ over several decades.

2.6.1.2 Case Context

In the late 19^{th} Century the communities in this particular region were established as Presbyterian missions. By the mid 20^{th} Century developments in mining resulted in the reserve status to be withdrawn for the town and its community in which this school is located. As a result of early European settlement and resource extraction, the demographics have shifted dramatically over time. Aboriginal peoples made up a majority of those living in the region prior to the 18^{th} Century. Today, however, Torres Strait Islanders and White Australians make up a significant proportion of the current population. According to the 2006

Census, Aboriginal and Torres Strait Islander peoples make up 60 percent of this region's population.

In the early 2000s an Agreement was ratified by Traditional Owners, Indigenous councils and mining companies. This agreement sought to acknowledge Indigenous land rights in the region and to hold the mining company accountable for contributing to local and Indigenous community development. One of the key aspects of this accountability is the responsibility of the mining company to strengthen employment, training and educational programs for Indigenous people in the region. As such, the company has had an interest in partnering with regional schools to improve Indigenous education and vocational pathways. One of the reasons for the establishment of an alternative school model was to provide a stable schooling infrastructure and leadership agenda for the region. Due to the high mobility of students, families, and teachers *and* the professional development needs of non-Indigenous and Indigenous teachers and leaders, specifically those who were not local to the region. The college model was established with the goals of "achieving organisational effectiveness and individual teacher accountability as the fundamental driver[s] of improved education, training and employment outcomes", according to its documentation. The history of land rights has had a significant impact on the context from which the college model emerged.

There is a major difference in the racial and economic demographics of this particular community and town in which this school is located in comparison with other communities served by the college. While the proportion of Indigenous people living in this community increased from 15.2 percent in the 2001 Census to 18.5 percent in the 2006 Census, it is still significantly lower than the proportion of Indigenous people living in other regional communities. The median individual and household income levels in this community are some of the highest in the state and are well above those reported in other regional communities. Those employed in the mines are earning high salaries which, contributes to fluctuations in the town's population that affects school enrolment. There was a reported increase in the number of children aged 0-14 between 2001 (565) and 2006 (798).

2.6.1.3 School Context and Demographics

School 700 serves students in Prep to Year 12; the other campus to which School 700 is linked serves students in Prep to Year 6. Together the school serves the largest student population in the region, with a reported total student enrolment of 1 212 students in 2010 (ACARA School Profile, 2011).

This figure has risen over the past few years. Enrolment at the other campus is less than 40 students, 100 percent of whom are Indigenous. School 700 had increased student enrolment from the mid-500s in 2001 to over 900 students at present. Students either live in the neighbourhoods immediately around the campuses, are bussed in from the regional communities, or board in the town's school hostel if they come from more remote communities of the region. The school aims to continue to plan for high Indigenous student and family mobility in the region due in part to climate, employment, and cultural migration patterns. Retaining staff can be challenging. While the remote status often makes the school more appealing than other remote locations because of the size of this town and its amenities (e.g. Woolworths), leaders report that given the unique context it is often difficult to identify staff who are a good fit and who can commit to staying if they come from outside of the region. As such, the school has participated in Queensland's Department of Education and Training's (DET) Partners for Success since 2000, which requires teachers applying to teach in any of the participating campuses to go through an additional screening process related to their commitment to and awareness of working with Indigenous students and a required orientation program before taking on a position in a participating school.

The school participates in regional, state, and national programs designed to improve the education of Indigenous students. For example, one such program was established by Department of Education and the Arts in consultation with Indigenous communities and organisations in the region in 2005 and employs a three-pronged approach to education reform, emphasizing community engagement, the provision of high quality education services, and the use of action research to drive school improvement.

The political context and successive reforms can generate positive and negative consequences. They can result in reform fatigue in staff, students, and community members who have witnessed the layering of successive initiatives with limited meaningful improvement. One staff member explains:

> *Our context means that we have access to a lot of those sorts of things [reform initiatives], but it means that there's…a lot of things that need to be done in a way that they don't seem to be extra – that they're enhancements into what we do, and they complement our existing agenda; and so…they're not extra on top of it….It's a constant school improvement process.*

The school restructuring that had been implemented just prior to the site visit was evidence of this constant school improvement process. The high staff turnover each year also contributes to the fatigue experienced by those who remain. The lack of an impact on student outcomes is of most concern to staff:

> *[To take a position here was a] really good opportunity to be a part of the education revolution of improving Indigenous outcomes. It was just so critical, and I could see the need from my own upbringing having seen my own friends just sort of drop out of school and nobody chase them up….Now teaching their children and seeing how that process has continued without appropriate intervention….I think there's been too many years of it just being passing the buck and pointing the finger in different directions….So I think what we see now and in low outcomes from students is only a symptom of a lack of attention and a lack of expectations around Indigenous education.*
>
> *I do want to see these things happen for our kids…things need to change and no one can make a decision what to do; so it's a bit frustrating….I haven't really seen targets exactly [for improving Indigenous outcomes]. I don't even know if we have a strategic plan that has them…but obviously we get funded [by the] Closing the Gap initiative….I know that we've had a lot of Indigenous year 12s…get their year 12 Certificate, but the flipside is what were their academic results like?...How many out of those students have a job or are at uni?*

For these staff, SSI presented an opportunity to develop a coordinated agenda that might produce meaningful outcomes in Indigenous education. Yet, for other staff, there appeared to be concerns that it may complicate the school context. The researchers did not meet with the school principal during the field visit.

2.6.1.4 Locating the Case in the SSLC network

School leaders at the Hub have been involved with SSLP since it was initiated. To date, 12 current and past staff members of the school have participated in SSLP, with several also trained as part of the Facilitator's Training program of SSI. This school became a SSLC Hub School in 2009.

2.6.1.5 SSLP Implementation and the Re-Articulation of the Stronger Smarter Messages

The influence of SSLP at the school is evident in the efforts to strengthen local, Indigenous capacity through the setting of goals for Indigenous student and staff development, and in the commitment of the staff to action research to improve outcomes. There has been limited participation in SSLP by teaching staff. In the region there are contending models of reform and debates over what is to be done.

School leaders at the executive and administrative levels of the school express a commitment to systems leadership, school accountability, and re-culturing schools to meet the learning needs of Indigenous students through systemic reform. While the emphasis on "Systems Leadership Theory" first emerged when the school was formed in 2001, school leaders initiated school re-structure and School-Community Partnership Agreement processes in 2009 that demonstrates a **culture of leadership** characterized by innovation, high expectations for Indigenous student outcomes, and Indigenous community engagement – key elements of the Stronger Smarter Philosophy.

Prior to 2010, the School was organized into junior, middle, and upper schools, today these divisions no longer exist. School administrators are now responsible for distinct areas and have new titles, including:

- Head of Academic Services;
- Head of Educational Services;
- Head of Student Services;
- Head of VET.

Two significant reasons for making this shift relate to creating the capacity for school leaders to set and achieve high expectations for Indigenous student learning and to adopt an innovative school structure that could meet the needs of students and community partners. Community and industry partners were concerned that the students were not prepared adequately, as evidenced by high levels of youth disengagement from school, low levels of student persistence through to graduation, and low employability of graduates by industry partners. There was also concern that, while vocational programs were popular with many students, there was in sufficient provision of "high level academic" programs as evidenced by the loss of students with high academic achievement to private boarding schools. The school leaders believed that many of these concerns were related to the fact that too much staff and school leaders' time was taken up managing student behaviour rather than focusing on managing student learning.

As such, the re-structure meant that the Head of Student Services became responsible for overseeing all student behaviour issues and policies, freeing up other staff and leaders to drive student academic and learning initiatives. One staff member explained the shift by noting that before the re-structure, Heads of Schools "ran our own schools as principals", whereas "a lot of those barriers are now broken down" and leaders work across schools to ensure a more "consistent" approach to school renewal. It was reported that this change also enabled the Head of Student Services to focus on encouraging positive student behaviour and leadership in addition to correcting inappropriate student behaviour, which may improve student engagement and learning over time. The Head of Academic Services is able to lead efforts to challenge high achieving students and use data on the academic achievement of students to set new goals and produce improved education outcomes for Indigenous and all students. The Head of Educational Services coordinates professional development for staff designed to improve student outcomes. And the Head of VET can pursue creative partnerships with industry and community partners to improve student readiness for career positions. For example, it was reported that the new structure enabled the Head of VET to use data and set vocational priorities in a way that highlighted the fact that there was a need for more programs to cater to the interests of young female students. At the time of this site visit, there were plans to initiate childcare and Elder care certification programs at the request of female students and to meet local, community needs in the early childhood and Elderly care sectors.

In addition to school re-structuring, the school initiated a process to establish Community Partnership Agreements with the four main communities of the region. This process represented a major priority for the school as was clear in the appointment of, an Indigenous staff member, at the executive administrative level to lead the effort. This Indigenous staff member has strong roots in the region as she grew up in the region and speaks the local language. She has been a successful teacher in this town for several years before her executive-level appointment. Some Indigenous and non-Indigenous school leaders and staff are familiar with local Indigenous cultural protocols and relationships as is clear in the orientation given to new staff about clan groups, language families, and traditional owner groups. Yet, in establishing the Community Partnership Agreement process, the school appeared to want to initiate a systemic approach to community engagement that would inform school decision-making, priority-setting, and outcomes. These agreements involve extensive community consultation, and represent shared goals for school outcomes, and describe the responsibilities of stakeholders (e.g., students, parents/carers, community and industry partners, and school staff) in contributing to these goals. Staff reported that their own participation in SSLP and the school's participation in SSLC gave them the confidence to prioritize Indigenous education outcomes and community engagement in their work at this school, including the work involved in establishing the Community Partnership Agreements.

In summary, SSI has had an influence at this school in contributing to the development of a school culture that emphasises high expectations leadership, and systemic community engagement. The school's commitment to hiring and promoting local, Indigenous staff and to instituting a guarantee to parents and students are part of a regional system approach.

Local Indigenous staff are actively recruited, prepared, and retained, in order to serve the needs of the students, to mitigate the high mobility of current staff, and to foster strong relationships with Indigenous communities. By supporting a Remote Area Teacher Education Program Coordinator on-site, this school encourages local, Indigenous people to pursue certification as Indigenous Education Workers and teachers. Two of three members of the leadership teams are Indigenous. Both Indigenous and non-Indigenous school leaders report that the presence of Indigenous people at leadership levels has contributed new insights, led to innovative approaches to reform and goal-setting, and aided in Indigenous student and community engagement. For example, it was reported that a specialist team made up of staff committed to improving schooling experiences for Aboriginal and Torres Strait Islander students was formed in 2004. There is evidence that there is an increasing focus to spread the responsibility of improving student outcomes to school-wide priorities and to not leave this to a subgroup of committed staff members. It is also clear that Indigenous people in school leadership positions serve as role models and play a strategic role in developing relevant school reform. It was reported by one non-Indigenous school leader that the school had not yet achieved the goal of ensuring that "[o]ur local Indigenous staffing percentage…equal[s] the actual percentage [in the community]". In this case, some challenges have been raised to an espoused commitment to building the capacity of local, Indigenous staff.

This school set a guarantee to parents and students in relation to student achievement in 2006. The policy commits the school to support students in achieving a pathway from school when students and their families commit to maintaining consistent attendance and engagement in schooling. This also requires that the leaders develop pathways in partnership with industry and prioritise staff professional development to ensure students have academic as well as vocational options. All of these efforts serve to strengthen local, Indigenous capacity by supporting Indigenous student achievement, Indigenous staff professional development, and the investment of industry partners in positive Indigenous education outcomes.

Finally, the impact of SSLP can also be seen in the ways that the leaders have committed to **action research** in an effort to improve Indigenous education outcomes. There were two projects that had been initiated through collaborative efforts – one on improving Year 1 students' oral language through a technology-based interactive program and one on same-gender education in Year 9. The objective is to engage staff in reflection on leadership and then encourage them to develop an innovative initiative based in research to improve Indigenous student learning.

SSLP works to support participants in acknowledging their own responsibility for improving Indigenous education outcomes by emphasising the importance of self-reflection in leadership and engaging them in activities that highlight the culpability of leaders in contributing to an Indigenous schooling culture characterised by the "soft bigotry of low expectations". Whether it be the shift in the leadership culture; a commitment to growing local, Indigenous capacity; or in supporting action research, the impact of SSLP at the school can be seen in the reflective, local, and action-based approach to re-culturing what it means to provide a quality education for Indigenous students.

> *I've been at different schools with Indigenous populations...but from the [Stronger Smarter] Leadership Program, it just really focused you and it just changed me personally….The strength and challenges that they put on you are my personal aims and having that action research…it just does something to you…to have the courage and believing in your leadership to make a difference. So the difference is I came back…telling my…personal journey with racism and what I went through at the Leadership Program. So all my staff knew why I was asking the hard questions.*

The re-articulation of SSI messages at this school is related to what staff view as the function of SSLC. Staff explain that their participation in SSLC has been useful in developing a shared community agenda around improving Indigenous education outcomes with local and regional partner organisations and in supporting all staff to take leadership on this front.

> *What we decided to do…particularly under the Closing of the Gap agenda…we were aware that a lot of our local agencies – government or just [Town]-based – had really similar agendas and really similar focus. So [launching SSLC] was about working smart together and pulling that group together….Really sell it as it's not something extra; it's something to complement your existing agendas…. So get that shared vision and shared understanding for what we want to see for the future of Indigenous people in the [region].*

Though participation in SSLC afforded staff to contribute to shaping a broader community agenda, it was also reported that the school has recently become more cautious in branding itself as a Stronger Smarter Learning Communities due to the politics of Indigenous education in the region. Staff explained:

> *[SSLC] is a very touchy subject at the moment…I think with the … opposing sides…I feel like if it was pushed – the Stronger Smarter view…we could all be working together because there are so many of us that have participated in the [SSLP]…but I feel that it can't be done because of that conflict….It's like the branding of the Stronger Smarter conflicts with [other] branding … and we're either promoting one or not the other because they've got a conflict of interest.*

In many ways, this school is employing SSLC to enable *stronger relationships* with students and community partners and *smarter reforms* based in consistent, school accountability for measurable Indigenous education outcomes. Across the board, leaders expressed a belief in the role of their schools to "enable" Indigenous community capacity so that Indigenous people could lead their "own solutions" to community issues. As such, leaders reported a commitment to supporting students' Indigenous identity by fostering their "sense of belonging" in school through meaningful staff-student relationships and encouraging the development of Indigenous leaders at the school. Yet, it appears that the meta-strategy around high expectations is foundational to their reform efforts as it provides a consistent mechanism to develop a school culture that supports Indigenous student engagement in an effort to close the gap between Indigenous student achievement and non-Indigenous student achievement.

2.6.1.6 Acknowledging, developing and embracing a positive sense of Indigenous identity

Leaders explained that in order to support Indigenous student engagement, it is important to develop a more local knowledge about Indigenous students and families. Two school leaders in particular described their efforts to work with Indigenous staff and community members to develop a map of the traditional owner family groups and to learn more about students' clan groups to avoid the essentialisation of complex local Aboriginal and Torres Strait Islander groups. Improving staff local knowledge about family ties can improve their understanding of the kinds of peer relationships students find helpful and those that can be challenging to creating positive learning environments.

Leaders and staff indicated that supporting a positive sense of Indigenous identity involves ensuring Indigenous students feel that they belong at school which is evidenced by students feeling they "have a say" in decisions that affect them and the pride they take in being a student at this school. One leader explained that fostering a sense of belonging comes through when Indigenous students recognise that the school is a reflection of them – both in terms of achievements and regard for the school on the part of students and local community members. The work that staff do to understand Indigenous students' language and relationships can go a long way to making the school a welcoming space. Other leaders explained that staff must also talk with Indigenous students about the fact that Indigenous identity is so much more than the negative stereotypes they may hear at school, in the community, or in the media. A few leaders also explained that some of these conversations are important to have with Indigenous parents about the importance of Indigenous languages and the fact that the school does not view Kriol or Aboriginal English as bad English.

Several staff agreed that in their efforts to support a positive sense of Indigenous identity in students they are working to encourage students to take ownership of their learning and behaviour – to "monitor themselves" and "sustain" efforts staff had worked to "enable". It seems that this is part of a larger discourse about the importance of community self-sufficiency and self-determination. Yet it also acknowledges that it is Indigenous people, including students, who are the most appropriate to lead efforts related to Indigenous identity.

2.6.1.7 Acknowledging and embracing Indigenous leadership in schools and school communities

At this site, this meta-strategy was re-articulated in a range of ways that demonstrated some of the tensions at work at the school. For example, some staff and leaders emphasised the importance of supporting Indigenous people into formal leadership roles where they could have a say in decision-making and be "colleagues" at the executive and administrative leadership levels. At the time of the first field visit, it was reported that there were between 12 and 15 Indigenous people on staff, with at least seven certified to teach and four coming from a local community. Improving local capacity was again cited by a school leader as key for fostering community self-management:

> *We're addressing our Aboriginal Torres Strait Islander people as leaders already and using them for staffing and building our capabilities, because they're going to be here when you go, that's going to be their school. It has to be their school.*

However there were others who felt that it was also important to have separate spaces for Indigenous staff to share resources and develop initiatives.

Others pointed to leadership by Indigenous students (e.g., role as school captains) as evidence of the school's efforts to acknowledge and embrace Indigenous leadership. This connects with the desire to support Indigenous students in "having a say" in decision-making and in taking ownership of the school through role modelling.

Still others explained that it is "leadership of Indigenous education" – or a shared responsibility by both Indigenous and non-Indigenous staff that is important here. Non-Indigenous staff and leaders explained that they have a responsibility not to "collude" with low expectations for Indigenous students so must become leaders in this arena and take ownership themselves. One leader also explained that SSLP assisted him to prioritise and take responsibility for certain goals related to schooling. Yet, he went on to explain that his vision for Indigenous leadership would be Indigenous parents and community leaders working in the school to develop a local and culturally-appropriate curriculum. Another respondent affirmed this by making the distinction between "building capacity" and "enabling capacity", noting that she saw her role as working with Indigenous students and community to support their vision for education. Some Indigenous staff and leaders supported this re-articulation by explaining that school leaders have a responsibility for improving Indigenous education outcomes instead of seeing this as a "Black person's problem". One even went so far as to call on school leaders to do more to combat the racism that is prevalent in the town and community.

2.6.1.8 'High expectations' leadership to ensure 'high expectations' classrooms, with 'high expectations' teacher/student relationships

Staff at the Hub agreed that in order to transfer or communicate high expectations for Indigenous student learning, they must first have high expectations of school leaders. Several respondents explained that one of the key ways they foster a high expectations leadership culture is to maintain consistency in reform and leadership efforts. Described earlier, the re-structure and community agreements are key levers to build consistency across staff and with community partners. For example, the new academic head works across year levels to ensure there are sufficient learning supports and challenges for students at different learning levels, and the new education services head works to plan professional development across the school in strategic ways. A second approach to maintaining consistency is in setting and showing progress on measurable goals related to improving Indigenous education outcomes. Specifically, the guarantee enables school leaders to set clear targets for student engagement and completion while monitoring progress on these targets for up to two years after a student graduates.

There is widespread awareness by leaders of the complexities of setting high expectations. Identified issues include: age and ability grouping; tracking and differentiated instructions, and acknowledging growing independence of older students.

2.6.1.9 Innovative and dynamic school models in complex social and cultural contexts

School 700 has committed to decades of innovative reform with the goal of establishing a schooling structure, and set of partnerships, that support students in achieving success on a number of pathways. The region's community agreements and the role of the school in contributing to the success of Indigenous students across the region informed this reform effort. One of the clearest innovations has been the guarantee with parents and students. While there has been a longer-term reform, it appears that this guarantee strategy has been re-articulated in relation to the school's participation with Stronger Smarter initiatives.

In particular, when asked about this meta-strategy, leaders and staff made reference to several efforts to re-engage Indigenous youth. They discussed the programs which emphasised successful pathways for students, some of which provide alternative learning experiences for youth off-site and with industry and farming partners. Additionally the expansion of the VET programs aim to improve Indigenous students' pathways to employment. While there is some concern about Indigenous students, especially boys, being streamed into VET pathways, the restructure aims to ensure the accessibility of academic pathways.

2.6.1.10 Innovative and dynamic school staffing models, especially for community schools

As a Partners for Success site, staff applying to work at the school undergo additional screening and orientation to identify staff, from outside of the region, who would be a good fit. This school is also investing in training local teaching staff through the RATEP initiative and through creative use of their Closing the Gap funds to hire more staff who support Indigenous student learning, such as the Parents as First Teachers team, ESL teachers, and those staffing the Flexible Learning Centre.

Strategic use of funding is essential in supporting innovative staffing, as are decisions about whether to appoint staff to permanent or contract positions, how to schedule the school day, and the learning interface (e.g., online). Given the range of pathways and learning experiences available, leaders explain that they are considering different staffing arrangements to suit. So here, innovation refers to flexibility along several parameters.

2.6.1.11 Being a Stronger Smarter Hub School

The case of this school as a Stronger Smarter Learning Communities Hub School raises several issues about the unique and shared ways Hub Schools are participating in this initiative. First, the reforms it has adopted are shaped by its local and state context. Innovations in staffing have been enabled by DET's Partners for Success initiative, and the community agreements is required for all schools with more than 50 percent Indigenous students in their population. So, context and jurisdiction matter. Second, there is an apparent tension about the Stronger Smarter “branding” – with some seeing it as useful in fostering a shared community agenda and others raising concerns that it could fuel the already contentious politics in the region. Third, there were different perspectives about the kinds of leadership that participation in SSLP and SSLC enabled – with some seeing it in increasing formal roles for Indigenous people and others asserting that it supported non-Indigenous people in taking ownership for improving Indigenous education outcomes. Finally, staff and leaders at the school described a unique investment in Indigenous self-sufficiency, in creating the conditions that could support Indigenous students and staff in taking leadership for education.

2.6.1.12 Implications and Conclusions

School 700’s participation in SSLC has changed over the past year. It offers a meaningful site to explore efforts to transform a school’s culture and structure in order to improve Indigenous education, as well as the various tensions and complexities that go along with that goal.

Acknowledgement and encouragement are given to all of the people of this region and the communities working with the schools in their important work.

2.6.2 Case Study of School 100

2.6.2.1 Case Introduction

School 100 is located in a provincial community with a population of approximately 6000 people. The school caters for students from Years 8 to 12 and at the time of the site visit in 2010 had a student population of just over 950 students, 14 % of whom were Indigenous. Some of the Indigenous students are from remote areas and board at a nearby school or with local families.

2.6.2.2 Case Context

Changes to the economic situation in the region over past years, along with the 1980s declaration of a large area to be regarded as a World Heritage site, have led to major economic shifts across the region. The timber industry was downsized and the tobacco industry was deregulated and then collapsed in the 1990s. More recently the local farming industry was deregulated and this also impacted the economic stability of the region surrounding this school. This combination of events and the impacts of continuing economic change, new and unfamiliar market systems and the pressure to professionalise farm businesses, have led the region to shift in demography. A region that had once been stable and relatively prosperous is now dealing with economic upheaval, job loss, and in some areas, communities in distress.

The school is located on a large site, and there is a working commercial farm and forestry business that runs at the site as part of the expansion of the school’s agricultural facilities. A wildlife corridor is planned for the school boundary. A model of sustainable agriculture is the foundation of school plans for the next five to ten years. Further plans include building inside and outside teaching spaces, a laboratory, an administration space and a working cafe with commercial kitchen. A trade-training centre is being built for the delivery of construction courses. Two other centres are being developed at nearby towns to deliver courses in engineering and agriculture. Students will eventually travel between the school’s three sites to access their chosen course.

2.6.2.3 School Context and Demographics

In 2010 there were 135 staff at the school, 91 of whom were classified as teaching staff. Of this staff, six were Indigenous. There has been a drop in teaching staff from 2009 when the total staff number was 146. The school's leadership structure includes Heads of Department (HOD) for all Key Learning Areas (KLAs), and also for the streams of Teaching and Learning, Senior Schooling and Special Education. Three staff, work in the Special Education Unit, and there is also a Guidance Officer (GO) and an Indigenous Community Education Counsellor (CEC).

In 2010 the student attendance rate was 87% and in 2009 the total student enrolment was 949 with 84% continuity from February to November. The school disciplinary absences recorded for that year included approximately 150 short suspensions, 30 long suspensions and less than five exclusions.

The Responsible Behaviour Plan for Students outlines the expectations for staff and students in terms of the charter of values that include: responsibility, respect, tolerance (diversity and inclusiveness), trustworthiness, dedication (excellence), professionalism, innovation and creativity. The policy states that "instilling these values in our students will help them develop into '*Stronger and Smarter'* citizens of the future. Attendance is also addressed in this policy with clearly outlined consequences for persistent truancy or missing classes.

Students in Year 10 are expected to develop a plan for their senior education and training. This document maps out how they will work towards a Senior Certificate, Certificate 3 Vocational Qualification and/or a viable work option plan. The school has a commitment of service to their students and their families around exit options for students.

A number of support mechanisms are in place for Indigenous students. These include support provided by the Indigenous Community Education Counsellor (CEC), a daily breakfast club (supported by local businesses and two community members), as well as the general support mechanisms of the school such as a Chaplain a Guidance Officer (GO), a school nurse and health services from the nearby city.

The school has developed links with a national, non-profit organisation which works in over 100 secondary schools across the country. This program focuses on students who are 'falling between the cracks', working with that group to encourage students to stay at school or choose a pathway that enables successful transition to employment, further education, or training.

2.6.2.4 Locating the Case in the SSLC network

The principal reported that in 2005 Dr Chris Sarra had inspired him with a speech, about the story of Cherbourg, delivered at a National Awards ceremony. The importance of community support and Indigenous student engagement aligned with this principal's views about school reform and motivated him to take action towards education renewal. He attended the Stronger Smarter Leadership Program (SSLP) in 2007 at the Ration Shed in Cherbourg and he reports this encouraged him to acknowledge the importance to make improvements to outcomes for Indigenous students. In 2008, soon after this experience, the principal was promoted into the principal position of this school, which required he transfer out of the SSLC Hub where he had been working.

Since the principal's arrival at the school, both the school and the leader have had continuous association with the Stronger Smarter Institute. One of the first things that the leader organised was for a Deputy Principal to attend SSLP. In 2009, the CEC, a teacher, a HOD and two additional Deputy Principals also attended the program. One of the latter has since moved on from the school to take up the position of principal at an Affiliate school. In 2010 a community member, a teacher, an acting Deputy Principal and the project co-ordinator also attended SSLP. The principal is now pursuing postgraduate study related to the SSLP program in this school. His research is focused on Indigenous students and the need to make their needs, expectations and potentials visible in schools. The principal has stated the SSLC priorities for this school are attendance, Year 12 completion, post school guarantees and community engagement.

The school has selected to work with three Affiliate Schools, two that are also feeder schools and one that is a P-10 school whose student's transition to the senior level of School 100. The four schools are all in close geographic proximity, and the overall foundation for the hub network frame is around transitions. The establishment of the SSLC network has built on an existing network of educators that comprises 9 state educational facilities across this region. The established network has a vision to be a premier provider of quality education for children and young people and prioritises literacy and numeracy, curriculum assessment and reporting, teaching and learning and student outcomes

The HOD Teaching and Learning indicated that the SSLC represents:

> *... the network ... we are better, smarter, stronger, and together, ... as group we're all on the same page, the team is infinitely more powerful than an individual. ... within the networks that we have created here, is that it's a local response that we have identified that we can do stuff ... The fact that I exist is testament to the last 10 years of that as a cluster of building this up, that we now have invested - valued enough that we've got a person who is starting to build these sorts of networks.*

He described his role as being central to the organization and maintenance of the network.

> *... we have a CEO and the CEO directs what we're doing and we have to acquit these funds by this date. ... and it's very local. So if someone's got a need, you know, one school says how we're struggling with this as a group, we say, hey, we're in this together, how can we help you? ... So the team for me is the power of the network.*

He explained that there was no particular policy or program regarding the active encouragement of Indigenous community members in network decision-making rather there was sharing of strategies, information and resources. To illustrate:

> *...the [Stronger Smarter] Program happening down there for early engagement. When I sit with early childhood teachers, or the pre-prep childhood teachers, the networks that we have for that, we can talk about; do you know that [the CEC] is available to help with this ...? Do you know that [Name] Clinic do these services? ... It's, this has become an issue for our school, and how are we going to deal with it? We need to talk to these community members, okay, let's organise the meeting and do it. ... We're starting off with things that we can deal with. Things that are common for all of us, like the introduction of the Australian Curriculum, ... How can we approach it collectively, so that the message gets out within the community that we are serious about making sure that every kid, every day is learning at school and that's the same message. So when we see kids walking down the*

> *street, if they're not meant to be there, it's a consistent approach and the community knows it.*

2.6.2.5 SSLC Implementation and the Rearticulation of the Stronger Smarter Messages

The leadership at the school has focused on changing the values of the school by developing a school ethos that is underpinned by a philosophy of high expectations. Attending SSLP caused the principal to reassess his own knowledge and philosophy:

> *…it re-aligned me to the fact that I passionately believe in the capacity and the future of our Indigenous children and community and that I believe that the system is highly racist and precludes the kids from success in many ways ... it's the latent racism of low expectations ... the fields that we construct within the school that really add to disengagement of Indigenous students.*

Evidence that SSLP was having some influence was identified by the CEC who described a growing awareness by teachers about the varying language needs of Indigenous students of this school. Those students who were boarders often had difficulty understanding Standard Australian English (SAE) when they arrived from the remote regions compared with the local Indigenous students. She indicated that her thinking had changed, after attending SSLP, as she herself was more aware:

> *... because we get kids who board here. ... they come with a lot of stuff and it's different to our town kids – although we don't have lots of problems with our town kids.*

Many of the 'town kids' she stated came from families who are engaged in the workforce.

> *But these kids come with a lot of – can't read. I mean, they can read but they can't understand things. ... Language, ... Classroom stuff mainly. Even like the staff talking to them when they've got problems because some of the kids don't understand or pick it up properly. You know what I mean? ... It's good to know their background a little bit too.*

To further illustrate one student who came from a remote area and boarded to attend the school wrote:

> *... when I came to school here ... it was not easy to keep up with everything that was being said in the classroom. I knew some English but it wasn't Standard English so everything was twice as hard. Not only did I have to try to learn the subject, for example, Agriculture, but I was learning Standard English as well. That was tough.*

In an interview with this student he explained:

> *…that's my goal trying to get in the mines. Yeah but I've been going good, since last year. I learned a lot this year about Standard English, how to sign papers, how to do resumés, even change the way I speak, yeah, yeah. If it was last year and I would be talking to you I'd be like using the word been or I been doing this. That's another ... up [there] they all talk a type of English, Pidgin talk. Yeah, it's a bit hard for me from there straight down here.*

The Stronger Smarter philosophy has been interpreted and re-articulated at this school as building capacity. This applies particularly in relation to developing the capacity of Indigenous staff members and establishing relations with non-Indigenous staff. In the improvement of Indigenous student outcomes it was claimed that all teachers are raising their expectations and pedagogical awareness of how to relate and develop their relationships with Indigenous students, their parents and the community members. The school's 'strong and smart' planning approach for closing the gap between the outcomes of Indigenous students and non Indigenous students is the driver for this reform effort.

SSLP has encouraged the school to engage more closely with the community. The recent employment of more Indigenous staff, such as the three Indigenous tutors, has helped to develop improved community relations. An Indigenous Elder from the local community confirmed that things were "changing for the better" with greater awareness and interest by the Indigenous community about the school.

> *Whereas, before, people just take things for granted and they don't mix. The community doesn't mix much, but that seems to be changing. Every year up at the high school we have an opening ceremony ... There seem to be more people attending now than what they – especially Indigenous. They seem to be attending more and taking more interest in what's happening in the community ...*

SSLP has provided a philosophy and a framework that underpins the approach to action planning at this school. It has stimulated restructuring efforts and influenced the use of other programs to improve outcomes for Indigenous students. For example, the employment of three Indigenous tutors using funding from the Closing the Gap program. To support the identified priorities resourcing is co-ordinated from different agencies and programs, and partnerships with the community, have been initiated, developed or strengthened. Established partnerships, such as the network of educators, are focused on shared goals, strategies and resources.

The leadership team has used its combined understanding and experience of SSLP and Indigenous education more generally to challenge teachers' assumptions regarding Indigenous students, teachers, community members and Elders. Teachers appear to be increasingly accountable to the leadership team for their teaching and learning outcomes with discussion and analysis of achievement data and performance indicators. The school has increased opportunities to raise teachers' awareness of the local context, history and background regarding Indigenous groupings of the area. Systems to foster leadership with staff, community members and students have been promoted and developed. A common discourse for teachers, leaders and student to focus efforts for change is evident in the school's action plan that is based on the Stronger Smarter approach.

2.6.2.6 Acknowledging, developing and embracing a positive sense of Indigenous identity in schools

The importance of establishing "links and relationships with key people in the community" and "… links with elders or leaders" is emphasised in the school's action plan. An example of such a link that has been established is with an Elder, an Indigenous tutor's mother, who has been consulted about community-school relations. This Elder has been instrumental in fighting for land rights and improved outcomes for Indigenous students in the region. The specific links that have been made with community as a result of the Strong and Smart Action plan however are in their infancy at this stage of the plan's implementation.

The importance of acknowledging and developing a positive sense of Aboriginal identity by the schools was stipulated by another Indigenous tutor:

[We are] trying to encourage more of the local elders to be involved within the school. Whether it be like NAIDOC week, … talking to the students…

The third Indigenous tutor explained how the Stronger Smarter messages are rearticulated as engagement with community:

…trying to create a better learning environment as a whole, by encouraging the kids to be here, to be willing to learn, but not just that, but also encouraging the community to be involved. … You've got the facilities here, you've got people in the community that are willing to be a part of it… can help the community as a whole and the students ... in the past we've had barriers up where being Indigenous you were shoved to one side, and you were seen as the ones that weren't going to achieve, whereas today, they're trying to change that now.

The Indigenous Elder who the field workers spoke with indicated how things were changing from her view:

… most of our kids are gradually going through to Year 12 and some of them are going on to university, some have got good jobs and stuff like that. … I've had five children. Four of mine have gone on to Year 12, only one pulled out in Year 10. But the four of them have all got good jobs.

These accounts highlight the important work ahead for the school to address issues of inclusion and the involvement of community members into the school given their willingness to do so. The comments made by the Elder, the Indigenous staff and community members highlight the issues for the school and have implications for future action in relation to planning and building structures to promote community involvement in the decision-making of the school. Although still in its infancy there was a start being made by an Indigenous teacher of SOSE who was drawing on the community Elders' knowledge to develop and write a local history unit. The aim of this was to provide students with the history of the region and to acknowledge a positive sense of Indigenous identity.

2.6.2.7 Acknowledging and embracing Indigenous leadership in schools and school communities

The principal clearly articulated that one of the major strategies adopted for change in the improvement of outcomes for Indigenous students was the development of Aboriginal leadership within the school:

We're working very strongly at the moment on establishing systems that foster leadership amongst our staff and also foster leadership amongst our children

The principal stated that he believed in distributing leadership by building capacity from teaching to leading. He had purposively selected two members of the leadership team, the CEC and an Aboriginal teacher to attend SSLP in 2009.

The establishment of a portfolio for Indigenous education was a direct outcome of SSLP:

one of our leadership team leads a specific Indigenous Strong and Smart Agenda within the school to try and challenge people to address the gap between Indigenous and non-Indigenous outcomes. … he's a head of department.

The HOD HPE sees his role as very much about "trying to close the gap". He continued:

> *...steps in place to build a team to engage and start to improve Indigenous outcomes. So it was identified within the last year that they needed a Head Of Department to look after Indigenous education. ...It wasn't fully recognised and they realised that last year. In doing, so the tutors and the CEC weren't always shifted around, it didn't have any – it felt like they didn't belong. This year I've had the tutors, the close the gap tutors which has been fantastic, with the Closing the Gap initiative for the funding. That allowed us to employ three tutors 20 hours a week each, engaged with the CEC, myself leading an agenda with the Stronger Smarter...*

There was evident restructuring and promotion of more Indigenous staff through the use of Closing the Gap funds to employ three Indigenous tutors to support teachers and to support students in their learning with particular assistance offered to Indigenous students. This was considered a valuable strategy to provide Indigenous students with more positive Indigenous role models to motivate and encourage them to achieve their own goals and Year 12 completion. To illustrate, a qualified, local Indigenous builder was 'headhunted' to work as one of these tutors, and he works with the Indigenous students in particular. The longer-term aim of the leadership team is to support the tutor to complete concurrent training in the first instance to become a qualified maths and manual arts teacher and then to develop his capacity as a leader of the vocational education training centre. This tutor sees a natural fit between maths and manual arts. He views the practicality of manual arts tasks as a way to engage students with the mathematical requirements related to measurement, ordering and the like.

The principal adopted a systems leadership approach and strategic planning that involved a situational analysis and the use of school data for action planning, along with the development of the school's action plan. Additionally, there was structural change with the delegation of responsibility for the Indigenous Portfolio to a HOD whose role is to lead the Indigenous Strong and Smart Agenda and a collective approach to challenging staff and students to address the gap between Indigenous and Non-Indigenous outcomes.

2.6.2.8 'High expectations' leadership to ensure 'high expectations' classrooms, with 'high expectations' teacher/student relationships

The school's action plan includes priorities, related to improved Indigenous education, which are reflected in: each key performance indicator, the establishment of an Indigenous portfolio, the appointment of an Indigenous leader to lead the strategy, to coordinate Indigenous work within the school, and to take responsibility for the Indigenous portfolio. The principal explained:

> *the strong and smart philosophy or framework that Chris rolls out with his five key areas, this is something that we've based our [action plan] on. It's all about the kids at the end of the day and how we get the kids through to the educational outcomes that I believe have been denied to them.*

High expectations was rearticulated as high quality, high equity outcomes. The principal saw his role as providing strong ethical and equitable outcomes for all students, the high expectations classrooms with high expectations teacher/student relationships was described by him as:

> *... individually managing every student to achieve ... and so [the] guiding principles within the school are very much about high quality, high equity, every player gets an opportunity to succeed at our school...*

The meta-strategies of high expectations leadership to ensure high expectations classrooms with high expectations teacher/ student relationships, acknowledging, embracing and developing a positive sense of identity in schools and innovative and dynamic school models in complex social and cultural contexts underpin the action plan. Actions and targets are set for each of these key themes. To illustrate, with regards high expectations one of the key actions is to engage the Executive Reference Team to review Indigenous student data and outcomes to meet the targets which include: closing the gap in student attendance in 2013; closing the gap in Year 12 retention by 2013; halving the gap for Indigenous students in reading, writing and numeracy within the decade; at least halving the gap for Indigenous students in Year 12 or equivalent attainment rates by 2020 and by that year lifting the overall attainment levels to 90%.

A Senior Education and Training Plan is developed for each Year 10 student who maps out how he or she will work towards a Senior Certificate, Certificate III Vocational Qualification and/or viable work option plan. This school also aims to provide a "service commitment that all Year 12 graduation students will enter into university, further training or full-time employment" (MySchool website 3/02/2010). To support this aim the leadership team has adopted an evidence-based strategy to disrupt existing ways of thinking and working (Ainscow, 2009) to challenge 'deficit views of difference' and stimulate self-questioning and action towards a possible reframing of perceived problems. The principal described his work as follows:

> *... to make sure that the school data assists higher expectations. ...data for the school [that] I can give to a teacher, they're able to use and it informs their teaching to be better at their work.*

He went on to describe the importance of the school's data systems:

> *... I do present ... data sets that I show within the school, that talk about our kids. ...I've presented as whole staff meetings, Indigenous data sets, ... other data sets which set targets for kids for NAPLAN... data that's going to move the kids that I'm interested in. ... I'm working with central office at the moment to try and come up with the data ... I need. ...I can then say to my teacher [for example] here's a kid who's two bands above national minimum standards in reading, but is failing in English ... in challenging the teachers to review their own practices, so that if a student fails, it goes from a blame the kid to how am I going to get them over the line...*

One of the HODs explained how he understood high expectations for both teachers and students. For teachers he saw that he had a role to challenge teachers to rethink their pedagogy. To illustrate he stated:

> *challenge the way you relate to kids, your relationship in the class. Why is that kid getting a D in your class, but turning up to your class every day? Tell me why?*

He continued:

> *We've had hard data that's been put in front of them to say, ... you can't use that as an excuse. ... I don't think our curriculum has catered for it (improvement in Indigenous students' outcomes) and that's why we've challenged the curriculum and there's a lot of things to do with our line structures, with kids coming in from remote [areas] who might turn up a couple of weeks late, arrive here and then all of sudden ... this is the only class ... that's available in this life for you ...they may not have any links or relationships ... to take back home. ... Too often we get a lot of kids placed in Physical Education and that's fine, however there are subjects there that need to be really looked at ... and line structures to allow them – I want to do my Certificate III in Rural Operations so that I know when I go back home on the farm it's going to help me. So that's now been reviewed, we've looked at that.*

So high expectations for students from this HOD's perspective included expecting that students would be:

> *... attending school every day. ... coming and willing to learn, willing to listen and attempting to work to the best of their abilities. No excuses ... I think it's a commitment from them to be here, if the expectation for teachers and staff is to provide a positive and high learning environment, then the child needs to apply themselves. They need to be organized.*

2.6.2.9 Innovative and dynamic school models in complex social and cultural contexts

This meta-strategy features in the school's action plan and is identified as a "strategic portfolio for Executive Reference Team Leader,". The strategy is focused on community partnerships. The principal explained:

> *So, it's with our business community, the service commitment, so making sure that our academic stream gains integrity. Then the high ... expectations of if you've got 10 percent of Indigenous students in your school, then you should have 10 percent of your kids in physics and 10 percent of your kids in chemistry and authority English. There's got to be an expectation around that, rather than populating with more Indigenous kids in English communication.*

The action plan's priorities of attendance, Year 12 completion, post school guarantees and community engagement relate to this meta-strategy. The roles of particular staff members, such as the Vocational Co-ordinator/Administrator (VC/A) and the HODs of Teaching and Learning (T&L), and Senior Schooling and Agricultural Studies (SS&AS) articulate with these priorities. The vocational education training centre is central to the innovative school model and was seen by one HOD as:

> *… the way the high school has ... re-invented itself in terms of ...Tertiary and Further Education (TAFE), in terms of school-based apprenticeship. ... you can complete Year 12 now and not just on one path… kids have options and they can start thinking about those things when they're fifteen ...*

A co-ordinator of vocational education described her role in this way:

> *I place students in vocational work experience ... like a structured work placement. I also look after the school-based trainees and apprentices and deal with their day-to-day happenings, training, sign-ups, on the job.*

This was considered to be an aspect of the innovative school model together with the Agricultural Studies program for Year 12 students. The facility for Agricultural Studies includes an on-site section, with a larger school farm under development on land acquired from CSIRO. The role of the HOD SS&AS entailed:

> *meeting our service commitment in terms of jobs and training and university, Queensland Certificate of Education (QCE), Queensland Studies Authority (QSA), school-based trainees and apprenticeships. ... my role next year is around supporting and putting programs in place and making sure everything, processes are right to ensure kids meet 100 percent of our service commitment ... inclusive of Indigenous students. ... opportunities to do traineeships and apprenticeships just like any other kids ... which has certainly grown. ... we started off with one, two years ago and we've got six Indigenous kids now doing traineeships and apprenticeships. We've had mixed success there but we've worked really hard to ensure that they do as well as they can. ... within the agriculture area, that's an area that the kids from[another area] have come to because they see it as a bit of an affinity, a lot of boys in particular.*

This assumption was at odds with what had been reported by some others who indicated that some of the students did not see the relevance of what they were studying in Agricultural Studies to their future goals of work on stations herding cattle or work in the mines.

2.6.2.10 Innovative and dynamic school staffing models, especially for community schools.

Dynamic models of staffing to bring about improved outcomes for Indigenous students, were rearticulated in the following ways: the establishment of the role of the HOD who had responsibility for the Indigenous Portfolio, the employment of three Indigenous tutors and the development of relations with community members. The Behaviour Management Officer (BMO) who was also a trained counsellor meets regularly with the HOD involved in the Indigenous portfolio, the Indigenous tutors, the CEC to "bring forward the whole philosophy of Stronger, Smarter in Indigenous education", as the BMO describes his role in support of improved Indigenous outcomes. It appears to be a team approach with roles and responsibilities made explicit and regular meetings to update on progress with the Indigenous Strong and Smart Agenda.

One HOD manages the Indigenous Portfolio and considers community relations to be fundamental. He indicated that:

> *... the interaction, the ongoing communication with the Elders and the events that the CEC's organising, that I'm present to engage with that, talk with the community members and listen to their problems [with the school], or any concerns. My awareness and knowing what's out there, when I line manage with [the principal]. I can foster that information on to him to say, hey, listen, we're not marketing in the right direction here. We need to take this angle. We've missed [these] ... people, or we've missed this sector ... We haven't considered this. Why haven't we? So for me it's the ongoing communication.*

The state primary schools in the local area together with this Hub school, fund the position of the HOD T&L for the local P-10 network. The responsibility of this HOD is to work with primary and secondary teachers to develop a seamless curriculum from P-10 and the strong emphasis on literacy and numeracy evident in our current context. He commented that:

> *... in terms of the Indigenous education ... the school is very clearly committed ... There is a clear sense that this is important business for us to be doing. It's*

> *worthwhile, not just for sectors of our community but for the community in general. ... we have ...staff that are ... passionate, engaged and directing people towards this bigger goal. In other schools I've worked ... it's been whatever people have been able to cobble together. That's just the same as we do sports day, it's just the same as we do everything else, whereas that's not the approach that's been adopted here ....*

When asked to clarify what he meant by this goal this HOD explained:

> *That there is a true sense of Indigenous perspectives in all curriculum aspects, in the minds and hearts of the teachers when they're dealing with all kids, that Indigenous perspectives are valued beyond just the classroom, that we know that, that enhances this town as a community, not just School 100. That we own, as Australians - you, me, we're all in this together regardless of race, nationality, creed, this is what it takes to make Australia more Australian.*

2.6.2.11 Being A Stronger Smarter Hub School

The principal has been actively participating in the Stronger Smarter Institute and has presented at teleconferences for SSLC. As a principal of a Stronger Smarter Hub School he has worked with the local network and the Affiliate Schools to promulgate the Stronger Smarter messages. The HOD T&L for the local P-10 network supports the Stronger Smarter messages in his role and responsibilities to Indigenous Education. He is aware how this school has supported Indigenous perspectives in the curriculum and across the organization and management of the Indigenous Strong and Smart Action Plan. There is evidence through the employment of the Indigenous tutors and the establishment of the Indigenous Portfolio at this school that it is developing expertise to be shared across the locally established network and with the Affiliate Schools.

The Principal has taken an active role in Stronger Smarter Learning Communities Network by providing information at the teleconferences and forums. In other forums the principal has discussed his strategies to improve attendance. He stressed that as part of the attendance policy at the school needed to have a plan as to how to engage the non-attenders in the learning programs at the school. He was clear on the need to analyse and identify the reasons students were not attending. He has reported that school renewal and community engagement; early intervention, specialised programs and mentoring, different schooling methods, interagency work and specific methods developed to match the local community context and most fundamentally improving teaching are key to improving attendance and outcomes for Indigenous students.

2.6.2.12 Implications and Conclusions

This school presents as a school where a principal and several key staff members are committed to reforming the school's processes to improve student outcomes. While the school has been involved in SSLC since 2009, the context and location of the school is such that reform will take time. The school has a large cohort of students who achieve high outcomes, and so instituting a shift of focus to existing and new populations of Indigenous students and to improving equity at the school will take time. Shifts in thinking across school staff, community members and parents will be necessary if change and reform is to occur in this context.

There are some challenges to achieving change at this school. The teaching population has been stable for many years, and while this has advantages it does impact on the readiness of a school to shift ethos. There remains an issue to balance the introduction of new programs to provide effective education for a broader group of students and more traditional academic streams of education. There was some indication from some staff that the school was losing its academic integrity and this warrants consideration as the reform process continues. Staff at the school and some community members reported that there had been shifts and improvements made to the school processes

The report of this case is then able to map the early signs of change as a school begins to think about shifting its focus to address the needs of a broader group of students. Whether the reform process built on the impetus of Stronger Smarter results in improved outcomes for Indigenous students will be evident over the next 12 to 24 months. There are signs of early shifts, and evidence of commitment to the project of key staff involved in the project.

2.6.3 Case Study of School 1700

2.6.3.1 Case Introduction

School 1700 is a public primary school situated in a rural city in Australia, located on the land of a large Aboriginal language group. European settlement of the region started in 1830, with gold mining causing an increase in non-Aboriginal populations around the 1850s. Populations around the school have fluctuated dramatically over the past century as a result of changes to agriculture, commerce and the economic situations in the region. Initial contact between white settlers and Aboriginal people in the 1920s and early 1930s are commonly discussed as the years of great conflict. The city remains a key centre for health and other regional services. There is a Local Aboriginal Lands Council, Aboriginal Medical Service, and Aboriginal Education Consultative Group in the city. The population of the city in 2006 was 35 000 with 31 000 of these identifying as being non-Indigenous (Australian Bureau of Statistics, 2006). The population is now estimated at 38 000.

The Hub school began as a small school in the 1950s, with sixty-five students and two teachers. Local Aboriginal language is used in school signage which is clearly visible from the front gate. After recent renovations, the school has a community kitchen which can be used by the school and community members, an undercover area for junior school students, a refurbished library and a renovated amenities block. Various funding schemes have been used over the years to establish learning spaces; there is an integrated environment after landscaping and fencing improvements in the school.

2.6.3.2 Case Context

School 1700 has been a *Stronger Smarter* school since 2007. The school was a 2009 SSLC Hub school and continues to be central to the National Network and to both regional initiatives in Indigenous education and SSI development over a period of five years. The Principal is called upon to provide mentorship to other Stronger Smarter leaders across Australia and is a featured leader in Stronger Smarter promotion and media material over several years. She was also involved in the original inception of SSLC and is a trained facilitator for SSLP.

The suburb in which the Hub school is located is a community residential area that sits on the edge of the city. The school site is located in the neighbourhood. Surrounding there are light industrial sections and there is a working sale yard in the area. There is an oval near the school and some green space, but the area is relatively densely populated and there are several other local schools close enough for students to attend. Blocks in the area are generally zoned for single residences, although there are some low density flats and units.

The region has a high rate of unemployment and many of the school's students live in homes subsidised through government housing schemes. On several occasions during our visit this area was described as being on the 'wrong side of the railway track'. Staff, parents and volunteers, as well as other city residents, reported that a major emphasis over past years has been to address the stereotypes that come with this location and naming.

2.6.3.3 School Context and Demographics

The Hub school first opened in 1952 as a two-teacher school that serviced approximately 65 students. During the 1970s, when the region and its largest cities were the target of a planned, decentralisation policy for business and industry from the nearby large city, the school had almost 900 students. The population of the school, the city and the region has gradually declined over the past four decades. In 2011, this school is a government sector primary school which services students in years K-6 across four Stages - Early Stage 1 (kindergarten), Stage 1 (years 1 and 2), Stage 2 (years 3 and 4), and Stage 3 (years 5 and 6). There are seven classes for students with special needs in addition to nine mainstream Stage classes.

There are several well-developed inter-agency initiatives that are embedded into the work of the school and community. For example, the combined resources of the school, community and other agencies fund four (4) before school age education programs which aim to improve pre-School transitions for children in early years. These programs are either run on-site, or by staff based at the school. There is also school-as-community centre and an Aboriginal family worker located at the school. Agency support to the local community is also provided, aiming to develop positive networks to assist in meeting student and community needs. Success of these programs is evidenced by stable annual funding for what might be seen as auxiliary programs, the positive relationships between Indigenous and non-Indigenous workers at the school and between the school and other agencies, and the level of uptake of school and interagency programs both within and outside of school. Of course challenges still exist and not all community members agree with the approaches taken at the school.

The MySchool website lists student enrolments for 2010 as 222, with 100 girls and 122 boys. In reality enrolment figures fluctuate across the year. The mobility rate is between 30-35%, much of which is a consequence of Aboriginal families moving from the school community to another regional city in the north west of the state due to established family links between the two communities. Overall attendance has improved slightly over the past few years to 90% for 2010, with a target of 94% for the end of 2011. Indigenous students total 40% of the total student population, with eight percent of students having a language background other than English. Students generally live locally – although in 2010 the school received its first application for an out of zone enrolment. Staff interpreted this achievement as an indication that news of the quality of the school's values, approaches and programs was spreading beyond its local neighbourhood.

The school services a low-SES population with high unemployment rates and low-income families, as indicated by ABS data. According to the ICSEA value is 800, however as reported on MySchool 2010, the school distribution as evident in the ICSEA report is skewed (73% in bottom quarter, 12% and 11% in the middle quarters, and 5% in the top quarter) and this should be taken into account when reading the overall value of 800. All of this data supports a common sense public understanding of the suburb as being a low-SES neighbourhood affected by poverty.

There are currently 57 staff based at the school (23 FTE plus additional program specific roles, along with casual and district support staff). The roles of these staff in the school could be classified as administration, teaching and student support. Each Stage class and special education class is staffed with a teacher and a School Learning Support Officer (SLSO). The Senior Leadership team comprises a Principal, four Assistant Principals and a Teacher Mentor, and has been expanded recently to include the SLSO-Koori who will lead the implementation and design of the Knowledge House in 2011. The Assistant Principals each have responsibility to support the teachers from one Stage in curriculum and pedagogy work. The focus of this support is to achieve consistent co-operative approaches to planning, engaging and effective teaching, and learning, for all students. There are additional portfolios staffed with SLSO positions such as the SLSO-Koori position. The Aboriginal Education Assistant (AEA) works across the leadership and teaching staff, and Aboriginal parents, to help support the learning and engagement of Aboriginal students particularly. Reading Recovery teachers, Support Teachers Learning Assistance, Step up to Reading Teacher Aides, a librarian and ICT leader support students in their learning.

SSLC is one of a number of programs that the school draws on to improve Indigenous students' achievement and to facilitate community engagement. These programs, various funding sources and multiple approaches are employed by the Hub school to achieve the targets set in their Management Plan (School 1700, 2011). These targets include long-term links to projects such as *What Works,* a disciplined commitment to approaches such as *Reading-to-Learn* (*R-to-L*) and *Positive Behaviour for Learning (PBL),* and key foundations to curriculum, pedagogy and student management, as well as funding through the Priority Schools Funding Program. The school has completed five years in the *Schools in Partnerships (SIP) Program* which has resulted in success and potentially sustainable initiatives. For example, SIP funding was used in part to fund a local playgroup, and provided a focal point for access to other services such as medical and education services for parents of Aboriginal young children. SIP funding has also enabled intensive support for teachers and the school AEA in the initial stages of establishing parent participation in Personalised Learning Plans (PLPs) for all students. The funding was used in the initial stages to provide release time for teachers to meet with parents and for the AEA to mediate the meetings between teachers and Aboriginal parents. However, the school is considering how to make these programs sustainable without SIP resourcing. Teachers now receive one half-day time release support for attendance at these meetings, and not the initial allocation of one full week and the program continues to run effectively.

The PLP program is now sustainable without additional funding sources, and achieves more than 90% parent attendance rates. While the Aboriginal education worker was crucial in supporting Aboriginal parents to attend in the initial stages of this program, she reported that she wasn't as heavily involved in late 2010, leading her to speculate "that they [parents] could do it without support".

SIP funds have also been used to fund participation of staff members in SSLP which has "opened cultural thinking and empowered staff to work effectively in bridging the gap" (2009 School Report). The school has more recently (2010) become a National Partnerships for Low Socio-economic Status School Communities school. Funding from this program has been used in a district initiative to employ a National Partnerships Mentor and a Connected Classrooms' Coach to work with this school and others in the district.

In addition to the larger funding schemes described previously, the school has been proactive in applying for and successfully gaining funds from other agencies and departments. For example, a partnership with a regional not-for-profit organisation has been brokered to make the Hub school's long-running Transition to School Program sustainable. Also, the successful application to SSLC Capacity Building Funds to support the development of a Knowledge House on-site at the school, and to employ a co-ordinator for this program in 2011.

The school's outcomes data for year 3 and year 5 students on NAPLAN are used with a range of other data on outcomes that the school collects, reports and analyses. Compared to statistically similar schools in 2010, year 3 students achieved results substantially above their peers in Reading and Grammar/Punctuation, and above in Spelling and Numeracy, while year 5 students achieved results that were above their peers in statistically similar schools in writing. In all other domains across year 3 and 5 the students at this school achieved results that were close to those achieved by students in statistically similar schools, except for year 5 students who in Grammar and Punctuation achieved results that were below those of year 5 students in statistically similar schools. MySchool data is reported across five categories – Reading, Writing, Spelling, Grammar/ Punctuation, and Numeracy. When schools are compared to statistically similar schools on the MySchool website they are categorised as being substantially above, above, close, below, or substantially below the results of students in the statistically similar schools.

2.6.3.4 Locating the Case in the SSLC network

The current Principal arrived at the school in 2004 and attended SSLP in Queensland in 2006. She reported that much had been achieved in the first few years of her leadership at the school, and described the period after her SSLP attendance as one when *things started happening rapidly* (interview with School Leader, 11/10). As a Stronger Smarter leader, the Principal reported taking a two-pronged approach to renewal and school reform. First, she prioritised professional development for teachers; this included early determination to achieve a critical mass of people trained in the Stronger Smarter philosophy working in and around the school. To date, all school Leadership Team members, many teachers and school workers (including voluntary workers) have been supported to attend SSLP through funding from SSI, regional funding and other sources such as Jobs Australia scholarships. Despite this level of support, achieving a critical mass of SSLP trained staff requires a large investment of resources from the school, and the Principal suggested that an additional strategy was required. Consequently, the SSLC in the region, lead by this Principal, has been heavily involved in the initiation, planning and implementation of a new iteration of SSLP – regional programs organised by regions or systems, conducted at or near the school, and offered to a wider range of school and community members. This initiative has been replicated in other regions of the network.

Over the school's five-year involvement with SSI, the Institute's director, Dr. Chris Sarra and other SSI staff have presented forums and workshops for community groups, parents of the school, its Affiliate Schools and workers from other services. The Principal of the Hub school has encouraged and organised access to SSI messages for people within the school, community and education region through these forums and workshops.

The second strategy employed by the Principal was to foreground the development of leadership throughout and around the school. Although, the Principal reported that she was not involved in *building capacity* of her staff, students or the parents and community around the school – but rather she has facilitated an environment where the capacities of all can be utilised.

The school and its initiatives have been highlighted on a variety of SSI media and communications, including at the inaugural SSI Summit in 2009, with numerous staff members presenting papers on the school's varied initiatives. At the regional level, reporting by staff members occurs through presentation of school approaches and achievements to others; these presentations are usually badged under the Stronger Smarter flag.

The Principal was a member of the planning group who initially met to form SSLC in 2009. She reported that the processes created strong links with SSI and provided recognition that the approaches that the school employed were on the right track. Despite indicating that the workload of being a high profile SSLC Hub leader was larger than she first expected, the Principal reported that being part of SSLC was now all encompassing for herself and the school:

> *We've had a lot of benefits…yep. It's hard for me to disassociate anything we do in our school from anything else. SSLC and the whole Stronger Smarter approach. It's is a co-operative part of all our thinking and affects everything we do…*

The school is taken as a model to learn from by other SSLC Hub leaders and subsequently involved in what SSLC staff call *lateral links* with other schools; where Hub Leaders across regions learn from each other through the SSLC Network. The Principal discussed how moving from SSLP to SSLC was the logical way forward as it allowed for positive outcomes developed from the leaders' commitments to the Stronger Smarter philosophy to be shared and further developed across a network of schools. The school continues to be central to the developing regional Stronger Smarter approach, and the Principal continues to be closely affiliated with SSI and a strong leading force in the Hub leaders' forum and National Network.

2.6.3.5 SSLC Implementation and the Rearticulation of the Stronger Smarter Messages

The principles of Stronger Smarter are well established in this Hub school. The Principal describes her original participation in SSLP (in 2006) as being:

> *…very powerful for me at that point of time. I came back with some passion and structures. I think what I came back with was no longer being judgmental, it just had to be … we were already doing lots of things in the community – like I'd visited all our parents at their houses, things like building relationships and we'd started doing data driven work on … our students' results are here and we needed to be (doing that) here.... and it just gave me, it just gave me… credibility is the wrong word… I gave myself permission to be …….. and make a difference on those types of issues, and once I took being judgmental out of any of the things we were doing things moved forward quite dramatically.*
>
> (Interview Principal, 11/10)

An example of the way that SSLP practices have been integrated into the school, the Circle is now a key fixture of staff meetings, community engagement meetings and even classroom structures. The process of Engoori (Gorringe, 2008) frames planning for reform and change around a model that investigates:

- What's the issue?
- Who is and who should be involved in the conversations? and
- What is the benefit and non-benefit for the students at the school?

The Engoori model has been adopted by a community group which meets to talk about school, student and education related issues. After returning from SSLP two staff members initiated the development of *Community Yarnup* in response to the need for a less formal space for parents to talk and problem solve around issues at and with the school. In these meetings, particular staff are called upon to respond or provide clarification as required. Parents discussed how this initiative had now become a space to enable them to get the answers that they wanted about different issues.

There is a rearticulation of the concept of *Stronger Smarter* into everyday school texts across a variety of levels, contexts and relational settings. Staff challenge themselves and their colleagues in planning and assessment meetings using the five Stronger Smarter messages as a framework, students are asked to articulate verbal, written or visual responses to statements such as '*We are Stronger and Smarter when we __'*. Much of the written material around the school cites Stronger Smarter as the foundation principle for behaviour and self management. For example there are posters that state *We are strong and smart when lining up for the bus if we ___'*, and students are regularly asked questions such as *Was that being Strong and Smart?* and *What could you have done to be Strong and Smart then?*

It is evident that Stronger Smarter concepts grounds much of what happens at the school, and yet when administration, staff, students, and parents are asked to unpack the reform or change that has occurred at the school there is most usually a direct link made to other programs and initiatives, such as the strong pedagogical approach of *Reading to Learn (R-to-L)* or the strength and routine of *Positive Behaviour for Learning (PBL) programs.*

Therefore, unpacking the five Stronger Smarter messages and how they are deployed and rearticulated within the school will assist in locating what 'being' a SSLC Hub School has meant at this site. Data collected and analysed, revealed that as in the case of many of the SSLC Hubs, the messages are rarely expressed in isolation, being taken instead as hybrid combinations of a variety of strategies, metaphors and symbols.

The leaders of this school and other members discussed their strategic directions (e.g., improving community involvement) or particular programs (e.g., Reading to Learn and the initiation of collegial phase level planning for literacy) rather than how they work to facilitate the messages of High Expectations or Promoting Strong Indigenous Leadership at their school. That is, the leaders seem more likely to articulate the approaches to strategic priorities that mark them as 'being' Stronger and Smarter, than to articulate if and how their approach is driven by the five Stronger Smarter messages. However, the Principal and at least two Indigenous leaders at the school stated that the Stronger Smarter messages were a powerful part of what they took away from SSLP.

2.6.3.6 Acknowledging, embracing and supporting a positive sense of Indigenous identity

The Hub school has 'acknowledged, embraced and supported a positive sense of Indigenous identity', in part, through representations and *symbols* around the school and community. There are striking school murals, which have in many cases been designed by students, and painted by or for students with the support of local Indigenous artists. The school entrance is marked by a welcome sign in Local language, and Indigenous literature is used within the classrooms and library. Significant events such as NAIDOC Day are celebrated at the school and within the regional school network. These are seen as opportunities to invite people who are seen as important role models into the school, including local Aboriginal elders and leaders, parents and community members.

As is the case in many of the Hubs in the national network, this school interprets embracing 'Indigenous identity' as providing visible spaces to value 'Indigenous identity' which relate mainly to *physical*, *relational* and *structural* elements. The school is in the process of setting up a program that will see the design and development of a Knowledge House (modelled on a similar space in another SSLC Hub) as one example of how *physical* spaces are being shaped and shifted to promote and acknowledge a positive sense of Indigenous identity within the school. Key *relational* shifts include practices that give priority to consultation and participation in important conversations and more measured planning for reform. Additionally there has been a concerted and successful attempt to include more local Aboriginal people working and leading within the school. For example a local Aboriginal man, who was a high level football player, has been hired at the school to work with senior school students. School leaders, teaching staff, students and parents (both Aboriginal and non-Aboriginal) described the positive effect of having such a role model within the school. It is expected that this staff member will take a leadership role in the Knowledge House program.

The school has had partnerships with other agencies, community members and parents over many years which have enabled programs such as early learning transitions programs. These initiatives have provided positive supportive environments for Aboriginal and non-Aboriginal families. According to leaders at the school, the early learning transitions programs have provided spaces to facilitate strong and positive demonstrations of the parents' and community members' capacity to lead and work with and for their local community.

Structurally, there is a strong commitment to including Indigenous content into the curriculum. A Language Program in an important Local Aboriginal Language has been implemented at the school over some years. The program has been intermittent in delivery due to difficulties with access to teachers of the language. The school has recently hired a young local Aboriginal teacher who has taken on the roles of an early phase classroom teacher and will facilitate the leadership of initiatives such as the language program. The foregrounding of local language as a curriculum decision for all students at the school is one example of a how reform actively works to promote positive understandings of Indigenous identities for Aboriginal and non-Aboriginal students, and respect for the cultures of Aboriginal students.

2.6.3.7 Acknowledging and embracing Indigenous leadership in schools and school communities

Indigenous leadership has been targeted across staff, students, parents and community spheres and is evident in the practices of providing spaces for a variety of Indigenous people to take up leadership roles within the *Leadership for Advocacy* model. This model is a foundation of the leadership structures of the school. Several Aboriginal staff members began their connections with the school as parents and volunteers, moving into paid work and then into leadership roles. In general discussion, they suggested that leadership is both a responsibility and a right. Other Aboriginal staff members cited their involvement in SSLP as an important space for their initial thinking around strong leadership and their role as leaders within the school. For example the Aboriginal Family and Community Worker based at the school said the following during interview when asked to discuss the SSLP program:

> *I think it's one of the most fantastic rollouts of this I have ever, ever seen. I've been involved in a lot of training, a lot of programs, a lot of workshops. But this beats them all. Mainly because it's a strength-based approach with people… It takes you through a segment where you're evaluating your own values, your own ethics, your understandings… It was awesome for me, my personal journey, in Stronger Smarter. It affirmed a lot of things that I knew about myself, but was hesitant in my leadership to reveal…*
>
> *Aboriginal Family and Community Worker, 11/2010*

Other Aboriginal staff members in the Hub school also reported that SSLP was a catalyst for developing perceptions of themselves as leaders within the school and community.

Indigenous students regularly hold positions within the school's student leadership structures. For example, one of the two School Captains in 2010 was an Aboriginal male student, and for the past 4 years there has been an Aboriginal School Captain; all appointed after school elections. As the Principal detailed:

> *There's no special consideration given for the roles, we just give them a space to learn and respect themselves – but then all kids have the same opportunities once it is time.*
>
> *Principal, 11/2010*

The range of roles in which Aboriginal staff act in the school, include membership of the leadership team, teachers, teaching assistants, support officers, volunteers and tutors - the notion of critical mass again emerges as important. Staff, regardless of role, are all involved in the leadership of teaching or engagement with students and their families – that is the SLSO and teachers seem to work collaboratively within the classrooms. School leaders and teachers noted the importance of having strong Aboriginal people in important roles in the school, both to ensure that the Community and those within the school see positive Aboriginal leadership as part of everyday life. Another reported benefit was the opportunities for Aboriginal leaders to support and nurture other Aboriginal staff, students and volunteers.

Structures and collaborations between community and school personnel has resulted in a number of programs that suggest that the School's commitment to 'acknowledging and embracing Indigenous leadership' extends beyond consultation toward respect and recognition of existing capacity. The PLP was highlighted earlier as an example of the Hub school's approach to facilitating connections between teachers and parents. Through these connections, the PLP is also seen to acknowledge and embrace parental leadership, re-working the teacher-as-expert model; where parents and teachers collaborate and discuss student progress, and set targets. In the PLP model the focus is on making visible that knowledge important to student achievement is held by both parents and teachers. In interviews with students at the school, the PLP meetings were highlighted as evidence of parents' involvement in or visits to the school. These students were able to detail the purpose of these meetings, what their parents talked about with teachers during these meetings, as shown in this response by a Year 4 student's response:

> *We talk about my numeracy, my reading, my literacy. If we've gone up levels or gone down levels, stuff like that…(11/2010)*

Supporting strong Indigenous leadership at the school and around the school is seen as "critical, and tied with Aboriginal identity and it ties with self-respect, resilience, all those sorts of things" (Principal, 11/2010). This is another example of how this school has embedded Stronger Smarter approaches within existing structures and values – everything being tied to self respect, resilience, and promoting a positive ethos and positive self confidence in the school's participants.

2.6.3.8 'High expectations' leadership to ensure 'high expectations' classrooms, with 'high expectations' teacher/student relationships

> *Researcher:* *What is it that makes them really good teachers; that helped you to learn lots?*

Year 4 Student: Well they gave me a good – they gave me a bigger brain than I had before. And they told me to learn stuff.

Promoting high expectations at this school is about academic performance and, according to one student, getting 'bigger brains'. Promoting high expectations at this Hub school is also characterised as *stepping up to the plate* (a phrase used by staff throughout the field visit and observed in other school activities such as staff meetings) across a range of areas. School leaders, staff, and students discussed high expectations as having expectations of themselves to work as hard as possible, and to have high expectations about their performance and what they could achieve at the school. The Principal discussed the links between expectations and school culture and described how she had worked toward having a culture where everybody was expected to, and believed they could, learn. There was talk across the interviews of turning around deficit-model thinking in the school. Views that 'these' kids could not learn and that low expectations of schools like 'these' were acceptable were entrenched in both the school and in the perceptions of those within regional office and in the broader city community. While perceptions like these were evident in the past, the Principal reported that:

I don't think we talk like that anymore (11/2010)

Time spent in the staff room and classrooms at the school attests to this. Talk in the staff room is about curriculum and pedagogical strategies and not about children and things they can't do. This sentiment is expressed by an Aboriginal SLSO in the school:

> *Relationships. I think relationships is a massive one. Everyone gets along I think. There's not a negative vibe anywhere in this school. I think everyone is here for the right reasons. Everyone's here for the children.*

Collaborative planning models – adapted from the Reading-to-Learn model – require professional conversations between stage teachers and their curriculum leader as they plan reading and literacy lessons. These planning meetings occur weekly, and involve planning of lesson structures along with moderation of teaching and assessment products. Teachers hold each other accountable during these meetings and there is an insistence that all students engage at stage appropriate levels. This turns curriculum conversations to be about the teaching and support that will be required to enable all students to access stage appropriate texts rather than to be about compensatory measures for students who are not engaging at stage appropriate levels. The results of this focus on reading particularly are evident in results – both school-based data which are monitored closely as part of the Reading-to-Learn approach, but also in some domains of NAPLAN. More recently there has been a focus on writing and numeracy with the school adapting the curriculum cycles approach from Reading-to-Learn into the other areas of literacy and numeracy.

High expectations are also key to the approach to behaviour at the school. Again what is cited as coming from a Stronger Smarter approach is built on the foundation of another tightly framed program. Positive Behaviour for Learning strategies are used consistently across the school and are made visible through posters, talk and an elaborate system of incentives and punishments that are transparently set out for staff, students and parents. Some of these posters have been adjusted to take in the messages of Stronger Smarter as well.

There are two important considerations in relation to the approach to high expectations at this school. The first is a notion of consistency. The programs used to organise and structure approaches at the school all provide consistent, transparent structures and language. This consistency is evident in how individuals take up the message; with a common language evident in the curriculum conversations that occur daily in the school. Secondly, using other programs to enable or even embody the Stronger Smarter approach. What Stronger Smarter has not provided, such as a strong doctrine of best practice literacy pedagogy, or an approach to regulating student behaviour, has been facilitated by other programs. However throughout the school, the structuring of the school's approach to renewal and to the ongoing philosophy and culture of the school is credited as being the result of involvement in the Stronger Smarter approach to school renewal and reform.

2.6.3.9 Innovative and dynamic school and school staffing models in complex social and cultural contexts

School approaches to staffing and structures is described as being about "meeting the needs" of the school and its students, families and staff. The Engoori model is employed to identify and position these 'needs' within the history and culture of the school and its people and to problem-solving in this context. Resolutions are then categorised according to whether structural shifts are required and the resourcing necessary to achieve these shifts. As a result, the innovative processes undertaken by the school are credited back to the uptake of Stronger Smarter philosophies. Staff at this Hub school have been willing and able within the framework provided by SSLP to address issues and implement shifts to their own practices. For example, new approaches to behaviour management have been implemented to assist in resolving a persistent problem with playground fights between children before school began in the morning. This issue was raised as a point of concern by teachers, leaders, parents and even some students, and as such all were involved in finding the solution. Previously, the first half-hour of school time was used by teachers and leaders dealing with the consequences of these behaviours, resulting in the loss of a crucial time for learning. Eventually outside play before school was cancelled and teaching staff were on duty in their own rooms, prior to the start of the school day. Resourcing was necessary to make indoor games and puzzles available to occupy students' inside before school. To ensure that workloads for all staff were equitably set, all staff whether administrators, assistants, or teaching staff begin their duties at 8.15 am. As issues were raised with the new structure, leaders, teaching staff, parents worked to design immediate solutions. From all accounts – including those of the students – this new structure was hailed as a positive development.

Another example of the school's use of alternative models to promote achievement is the before school age education programs mentioned earlier. The school has been involved in the provision of these early learning contexts as part of its approach to being a lead agency within the community. The Knowledge House for Aboriginal students, their families and the broader Aboriginal community, currently in planning and design stage, is part of a restructure by the school to shift the current schooling model. It is too early to discuss the impact of such a shift to the structures at the school, but this innovation warrants further investigation.

2.6.3.10 Being a Stronger Smarter Hub School

The central location of the school in the broader region and its positioning as a successful SSLC Hub school is instrumental in what the Principal names as the growth and spread of Stronger Smarter messages throughout the region. Currently, there are plans for other Hubs in the region to come on board.

Being part of the SSLC network has been important for the Principal, and other leaders at the school in authorising the school's reform goals to improve outcomes for low SES and Aboriginal students. The framing of leaders as 'Strong and Smart Leaders' has personal, professional and collective implications for those working at the school, and for those who were volunteer parents but who now hold employment either at the school or elsewhere in the network.

The place of parents in the school and the framing of: their knowledge of their children and their community; and what outcomes will come to be valued, has shifted over the past three to four years. Parents meet to query the processes of change in the Community Yarn–up circle. This initiative was too early in its implementation for conclusions to be drawn about its effectiveness during the field visit, but this initiative warrants follow up. Student outcomes are improving at this school, although these outcomes are still not commensurable with the results at all other Australian schools.

Being a Stronger Smarter Hub school has resulted in symbolic, relational, space and structural changes to the schools and the engagement of students, staff and community within and around the school. There have also been changes to the ethos or climate of the school with strong symbolic messages reinforcing the school's presence on The Land of important Local Aboriginal groups. Murals, language programs, texts in language and with Aboriginal content further reinforce this. Deficit talk has been replaced by targeted curriculum talk. Parents are considered to have strengths and these strengths are utilised and supported. This was evidenced by the number of parents who are in paid employment after starting as volunteers in the school, support for Indigenous staff in training and further education, for example, in teacher education programs. The Indigenous Knowledge House will enhance current approaches to promoting, acknowledging and supporting Aboriginal leadership across all levels. A significant feature of this Hub school's approach is how changes marked as Stronger Smarter, but framed explicitly and visibly within other 'programs', have changed the curriculum structures in play and the pedagogic relay evident within the classrooms.

2.6.3.11 Implications and Conclusions

The case of this school provides important contextual and site specific investigations, along with several issues that are more broadly significant to the evaluation.

First, the shift in ethos from a deficit-model of understanding students and communities, and the implications of this shift for how the community is framed at local community, city and regional scale within the school. This warrants further study, both longitudinally (to examine the sustainability of approaches), and to investigate if this has an impact on outcomes for primary students from the school as they transit to high school.

Second, the Hub school's framing of Stronger Smarter as the over arching enabler of reform and renewal is of interest, despite the fact that much of the structural and organisational change resulted from the school's adoption of another 'program'. More specifically, it would be valuable to gain greater insight into the reported shifts to curriculum structures and pedagogic relay, which also appear evident from initial data collection.

Third, the early shifts in the school's positioning within the community require further study, which would canvass broader community perspectives. However currently, it appears that some of the types of engagement possible by the community around the school are evolving given that opportunities for the community to have a voice in the Hub school are now available. There was also some evidence that within the larger city and the region the school's reputation was shifting as a result of the reforms.

Finally, the school is taking a critical and central role in regional approaches to improving outcomes for Aboriginal students. While it is a relatively small primary school, it has been influential in decisions made about secondary schools and pathways for students, as well as in decisions around resourcing and staffing within the Aboriginal education field is this region and perhaps the state.

2.6.4 Observations from Qualitative Cases

These three cases show the range of levels and kinds of engagement across the network with Stronger Smarter messages generated out of SSLP and SSLC communications. They were selected in part because they capture the stages of reform observed in serve Phase 1 field observations completed to date. Yet because of the limited number of cases here and the relatively early stage of fieldwork of the qualitative component of the research – this section concludes with observations rather than findings *per se.*

These summary observations illustrate the contextual conditions and issues that arise in the implementation of SSLC. They also point to the substantial challenges and hurdles that SSLC must contend with, if it is to make a difference in the long run. At the conclusion of Part 2 of this report, these observations are used to illustrate and corroborate overall, more generalisable trends from the quantitative data analysis.

All three school leaders have been engaged with SSLC prior to the commencement of SSLC, in the cases of School 700 and 1700 the overall school engagement with Stronger Smarter messages predated SSLC. So while it is too early in any school reform cycle to adjudge effects in Hubs with 18-24 months of SSLC engagement – School 700 and 1700 have been involved for what would generally be acknowledged in the literature as a full school reform cycle of five years plus (e.g., Riley & Seashore-Lewis, 2000). *All of the qualitative case field visits pointed to the necessity of continuity of leadership in the four-to-six year range as necessary (if not sufficient) for substantive change to outcomes.*

What these cases tell us is that local institutional and community context – the overall institutional history of the school – strongly influence how and in what ways these messages are actually translated into practice. This is a matter of place, people, and time: place refers to local community cultural, and school-level institutional contextual variables; people refers to the overall human resources – teacher, students, teachers, principals, community members, other staff – available; and time refers to the local and ongoing history of community, of school, of prior reforms, of duration of teachers and principals' tenure in the site.

In this way, all of the acknowledged variables of school reform – leadership style, tenure, and history; strategic focus; institutional philosophy, history and ethos; curriculum and pedagogy focus; analytic capacity with evidence; and, crucially, school/community relations come into play in setting the conditions for the uptake and effects of Stronger Smarter messages (e.g., Elmore, 2004; Bryk et al. 2010). But this is not to say that 'it's all about local context' or 'one size doesn't fit all' – which can become clichés rather than explanations of how these variable local factors work. Part of the job in this report is to describe where and how Stronger Smarter works (or doesn't) as a reform agenda, in what contexts, with what variable effects and student outcomes.

The three cases establish a continuum: from little sustainable impact on school ethos and student performance; to a still emergent focus on changing philosophy and practice in a school and community environment where there had been little explicit attention paid to Indigenous education on the whole school level prior to the arrival of the current leader; to a substantive coordination and mobilisation of existing and new resources, relations and innovation under the Stronger Smarter umbrella over a sustained five-to-seven year period.

In School 700, due to a range of factors, there has not been significant traction of Stronger Smarter reform messages. The school had a majority cohort of Aboriginal students and a longstanding track record of successive waves of reform and innovation over several decades. It had a high profile and influential school leader who, over a five-year period, had set a context of engagement with important pedagogical/curricular and pathway reforms. There was empirical evidence of improved pathway articulation during this period. The community and local business had ongoing roles with the school, encouraging and sponsoring varied innovations. As the case data shows, a number of school staff remain engaged and inspired by Stronger Smarter messages. A number of the major structural reforms (e.g., performance agreements, vocational education) are ongoing. However, with the departure of the leader, and with the emergence of contending philosophies and approaches to Aboriginal education in the region and in the school – Stronger Smarter messages play a less prominent role in the school. At the same time, a 'combined school', multicampus approach was, in this case, in transition – with different campuses opting for varied, and in instances, contending reform agendas. This added a layer of complexity and tension to school reform which arose during the field visit. Finally, there was little evidence in this school that the gains achieved during this leaders tenure were sustained. As one staff member characterized the situation, "reform fatigue" had set in, and there was polarization around different agendas.

While the school's dilemma cannot be attributed to Stronger Smarter messages or SSLC implementation *per se*, it illustrates some of the key problems facing this approach to reform:

- **That reform that is overly dependent upon dynamic or charismatic leaders can prove unsustainable after their departure.**

Note here that the Social Network Analysis (see Appendix 2.6) describes Hubs where the communication patterns are highly egocentric: that is, that an individual principal or leader remains the director and centre of messages and communication. The analysis contrasts this with selected Hubs where patterns of "distributed leadership" (e.g., Elmore, Peterson & McCarthy, 1996) exist, with multiple school leaders and others outside of the school engaged in ongoing and multidirectional discussion of reform targets, goals and strategies.

In School 700, as in all of the Phase 1 cases, there were multiple reform strategies in place that predated SSLC and SSLP.

- **That where the model is used to legitimate or rebadge prior or existing reforms, it can generate tension, contention and issues of staff and community 'ownership' of the reform.**

A central point here is that, particularly in Aboriginal and Islander educational contexts, many school settings have complex histories of reform and innovation that mediate and influence the uptake of the 'new'.

At times the impact may be negative, and at times it may be with justification. In summary, this case provides insight into a school that has been engaged in Stronger Smarter initiatives for several years. It does not at present publicly represent itself as a Stronger Smarter school or Hub. While there is evidence of significant changes made to the school's structure, curriculum and policy, there has been little or no improvement in more traditional measures such as attendance or NAPLAN results.

None of the schools we studied were *tabula rasa* operations. Change in leadership and the positing of Stronger Smarter as a 'new' model of reform can have collateral, unintended effects on the school's strategic directions.

Where Stronger Smarter reforms sit *vis a vis* previously established innovations and reforms was a further area of investigation. The research team reviewed the public representations of reform of the Phase 1 schools, reviewing their Annual Reports and websites, and collecting extensive written documentation on school operations in the fieldwork. A continuum of public representation of schools as Stronger Smarter was evident, from Hubs like School 700 that had little explicit acknowledgement of their SSLC status to those that had an explicit branding or badging of their philosophy and ethos as "Stronger Smarter".

School 100, School 1700, and many of Phase 1 schools, were 'waving the Stronger Smarter' flag. They were described as a Stronger Smarter school in school documentation, as part of visible signage around the school, on the school's website. As part of site visits, several Principals described the benefits and consequences of carrying the brand at the school (e.g., having a profile as an Indigenous school in terms of funding and community/media perception). Yet this branding process reflected varying degrees of substantive operational and strategic reorientation.

The second case (School 100) is a relatively small regional secondary school. The school is located in a town of approximately 7 000 inhabitants, in a conservative farming community. The school's student population is just under 1000, with 14% of those identifying as Indigenous. A proportion of the Indigenous students attending are from more remote areas and board at a local school. The school has a proud history of sending rural students to urban universities and, historically, has not had an explicit philosophic focus on Aboriginal and Torres Strait Islander education. As a Hub, the school has attempted to make changes across a range of levels: these range from the branding of action plans and philosophies with the Stronger Smarter badge; and the provision of dedicated spaces and programs for Indigenous students. Additionally, Indigenous staff leadership and participation have been highlighted, a community engagement plan and coordinators put in place. Finally, a system for staff to track and account for individual student progress has been established. These are major changes to what remains a stolid, conservative school, with traditional secondary approaches to curriculum and pedagogy. In summary, School 100 models a 'start up' situation with a Principal who is very strongly committed to the Stronger Smarter philosophy and approach. Structural changes are being made – but the case report tells us that the reform process, 36 months in, is a work in progress.

- **That in schools with smaller, 'minority' Indigenous student populations and more traditional school ethos - the reform process will require more time and different strategic decisions.**

One of the challenges that School 100 raises is the difficulty in translating change in school ethos and school administrative structure and accountability into improved face-to-face classroom teaching. The case of school 1700 is one of the few cases that have been identified where Stronger Smarter messages have been connected with a systematic approach to the reform of curriculum and pedagogy.

School 1700, the third case, is one of a very few cases studied to date where the Stronger Smarter brand has been used as unifying umbrella to successfully focus and coordinate a range of approaches and activities. Many of the schools studied here have a history of participation in national and state initiatives (e.g., Dare to Lead, What Works, Indigenous Education Support Structures (IESS), Partners for Success). While the overlay of Stronger Smarter messages generated tension in School 700 – in the case of School 1700 it was used by the Principal to unify, consolidate and extend previous and new innovations, with an explicit focus on curriculum and pedagogical reform in the teaching of literacy. In this case, the ‘rebadging process’ was constructive and successful.

- **That the Stronger Smarter approach can be used to successfully coordinate and unify a diversity of reform strategies, some of which were implemented prior to membership in SSLC.**

School 1700 is a primary school situated in a regional city surrounded by farming communities. The school is located in a low SES area of the city that is often described as disadvantaged by community members and local services. The students who attend the school live in households where unemployment levels are very high, and most families are recipients of social security payments. The school, while relatively small, is a central point of SSLC implementation in the region, and also a key player in inter-agency connections and programs for Indigenous and non-Indigenous peoples living in this low SES area.

The current principal began efforts at reform seven years ago, with a focus on changing school ethos and the implementation of a systematic approach to the teaching of literacy: a genre-based approach with a strong in-service training on scaffolded learning and explicit instruction. At the same time, substantive efforts have been put into community engagement with local Aboriginal and non-Aboriginal communities and with other local and regional government and non-government agencies. The results have been NAPLAN gain scores in writing over the past year, but no comparable gain scores in reading or numeracy. The case is of interest here as it provides insight into the use of Stronger Smarter as an umbrella for initiatives aimed at improving outcomes for *all* students who attend the school. There are four substantive observations that arise from the ostensive success of School 1700:

- **That the Stronger Smarter approach can be used to systematically reconnect with local Indigenous communities;**
- **That where Stronger Smarter reforms are tied to an explicit emphasis on the reform of curriculum/pedagogy in classrooms, student outcomes can be improved;**
- **That where it is joined to a curriculum/pedagogical reform agenda, the Stronger Smarter program can yield benefits for Indigenous and low socioeconomic non-Indigenous students.**
- **That the duration of continuity of leadership required for reform may be 4-7 years.**

The three cases presented here provide a broad overview of issues documented in the qualitative field studies of Phase 1 schools to date. What, then, are the variable local uptakes of Stronger Smarter messages and how have school leaders translated these into specific reform agendas, with what results for Indigenous student outcomes?

There is a continuum of adaptation of Stronger Smarter messages across the cases: from a focus on symbolic prioritization of Indigenous student achievement, culture and welfare (e.g., the development of dedicated spaces and 'zones' for Indigenous learners, an increased profile of NADOC day activities) to structural changes in school governance and operations (e.g., stronger Indigenous community links and influence on school decision making, increased Indigenous staffing, monitoring and tracking of Indigenous student performance) to substantive changes in face-to-face classroom pedagogy and curriculum. In other words, in instances the translation is relatively superficial in generating substantive alterations of school culture. Further along the continuum, schools have made substantive changes to what Phillip Jackson's prototypical school ethnography, *Life in Classrooms* (1968) referred to as "school ethos" – or the general character, hidden curriculum and "moral life" of schools.

Only in the case of School 1700, and 2 other Hubs in our data sets, is there substantive evidence of improved outcomes on some, but not all, conventional achievement indicators. School 1700's use of a specific curriculum approach supported by intensive professional development and followed up by school-level curriculum and pedagogy planning appeared to make a difference in Indigenous student outcomes. Here the Stronger Smarter philosophy was used as an effective umbrella for the mobilisation of community, teachers and students – but it was articulated into systematic reform at the level of the classroom. While this is not an endorsement of the specific curriculum program used, in this case "high expectations leadership" was systematically translated into changes in face-to-face classroom teaching and learning.

That case, according to all parties involved, remains a work in progress facing ongoing issues of consolidation and extension of curriculum/pedagogical reform. But it illustrates a substantive point in the school reform literature – that school leadership and school reform can only yield sustainable improvement in the achievement of traditionally marginalized students if it articulates into substantive and systematically orchestrated change in the face-to-face curriculum and pedagogical relations between teachers and students (e.g., Elmore, Petersen & McCarthy, 1996; Bryk et al. 2010).

Section 3 Quantitative Analysis

Section 3 of this report begins with an overview of the survey component of the evaluation study, outlining instrumentation, and the selection of non-SSLC schools for comparative analysis. It reviews measurement models and findings on both the School Leaders' Survey and the Teachers' Survey. It then turns to a multilevel analysis of the systemic data on SSLC and ACARA like-school achievement and attendance.

3.1 Stronger Smarter Project: 2010 Survey Design, Implementation, Sample Population

The design and delivery of Survey Research has been informed by the original research questions. The survey research describes the uptake of Stronger Smarter messages amongst leaders and teachers of SSLC Hub/Affiliate and non-SSLC schools. It also documents school leaders' and teachers' self-reports of school factors relevant to improved student outcomes.

As noted in Section 2, the original research questions are:

1. How influential is school leaders' participation in the SSLP in generating and sustaining school reforms and community engagement in the SSLC hubs, and improved outcomes for Indigenous students?
2. Do SSLC hubs across the national network have value-adding influence and impacts on their affiliated schools?
3. Do SSLC hubs and their affiliated schools function as learning communities with sustainable kinds and levels of community engagement?
4. What other systemic, community, cultural and linguistic, school, teacher, and classroom factors impact on school renewal and reform, community engagement and improved Indigenous student outcomes?
5. How scalable and sustainable is the Stronger Smarter approach to school renewal and reform in Indigenous education?

Table 3.1 provides an overview of the research questions and how they were translated into sections of the various surveys. The School Leader Survey addresses all of the research questions with a particular focus on 1-3, and 5; the Teacher Survey addresses research question 4 while also addressing questions 1,2,3.

Table 3.1 Overview of the research questions and how they were translated into sections of the various surveys

<table>
<tr><th colspan="6">Research Questions</th></tr>
<tr><td></td><td>1. How influential is school leaders' participation in the SSLP in generating and sustaining school reforms and community engagement in the SSLC hubs, and improved outcomes for Indigenous students?</td><td>2. Do SSLC hubs across the national network have value-adding influence and impacts on their affiliated schools?</td><td>3. Do SSLC hubs and their affiliated schools function as learning communities with sustainable kinds and levels of community engagement?</td><td>4. What other systemic, community, cultural and linguistic, school, teacher, and classroom factors impact on school renewal and reform, community engagement and improved Indigenous student outcomes?</td><td>5. How scalable and sustainable is the Stronger Smarter approach to school renewal and reform in Indigenous education?</td></tr>
<tr><td>Leader Survey</td><td rowspan="2">Section: Identity

Section: High Expectations

Section: Expectation for Student Outcomes

Section: Leadership

Section: Community Engagement</td><td colspan="2" rowspan="2">Section: Network Relationships

Section: Hub/Affiliate Relationships</td><td>Section: Pedagogy & Curriculum</td><td>Section: Innovative School Models

Section: Innovative School Staffing</td></tr>
<tr><td>Teacher Survey</td><td>Section: Pedagogy & Curriculum

Section: Classroom Practices

Section: Cultural Knowledge, Engagement</td><td></td></tr>
</table>

The Teachers' Survey is presented in Appendix 3.1.

The Leaders' Survey is presented in Appendix 3.2.

The developmental process is described in Appendices 3.3 and 3.4

Note that the original Stronger Smarter theme entitled "Indigenous Identity" in *the Project Implementation Plan* was renamed "Indigenous School Ethos" at the recommendation of IERG and IRG, who queried the normative and operational definitions of "Indigenous Identity" in the Stronger Smarter messages.

The analysis is at the Hub, Affiliate and Similar school level. The core research questions are centred on the impact of SSLC participation on various measures posited to effect educational outcomes for Indigenous students. To this end HUB and Affiliate membership was collapsed into the identifier "SSLC" while similar schools were designated "non-SSLC". In this context teacher and leader responses are viewed as a window into school environment which is then collapsed into the SSLC, non-SSLC aggregation. Response rates for the teacher survey at this level for SSLC schools was 59% (n=62) and 61% (n=28) for non-SSLC schools. Response rates for the leader survey for SSLC schools was 48% (n=49) and 22% (n=35) for non-SSLC schools

Where analysis is directed at the teacher level, for example in the descriptive section of the report, no claim is made with respect to generalisability to the teacher population; i.e., the results are sample specific and intended to provide complementary data to the qualitative component of the research design. Response rate on the teacher survey was 11.2% (n=299) across SSLC schools and 8.6% (n=111) for non-SSLC schools. Response rate on the leader survey was 36% (n=75) across SSLC schools and 21% (n=40) for non-SSLC schools. The total number of teachers responses (n=410) and leader responses (n = 115) is adequate to provide sufficient statistical power to drive measurement model specification and underpin comparative studies between the SSLC and non-SSLC groups. The analysis at this level is primarily aimed at fine tuning a follow up study focused at the individual teacher and school level. This study will target a representative sample of SSLC and non-SSLC teachers in approximately 45 purposively selected schools. Integration with the qualitative component of the research design will ensure rich representation of any quantitative findings.

3.1.1 Non-SSLC School Selection

For the analysis of systemic data on attendance and achievement, ACARA "like schools" were used to compare SSLC and non-SSLC effects. This was because the data sets were drawn directly from ACARA and all efforts were made to work from commensurate categories. The exact procedures for selection are explained in 3.9 below. In the analysis of systemic data, then, schools are referred to as SSLC and "Like Schools".

For the survey research – individual schools were selected for comparative analysis by the research team. The aim was to ensure not only institutional size and status, but location, demographic and cultural comparability – and to ensure that the non-SSLC cohort was not exposed to SSLP treatment effects. In the following section, these are referred to as "Non-SSLC schools".

A number of criteria were applied in the selection of 'like-schools' to match SSLC schools. The selection process was undertaken in two steps. First, a preliminary selection was made from like schools listed by ACARA on the My School site as 'similar schools'.

Second, further selection criteria were then applied to refine the process to ensure that the comparative match was as accurate as possible. These additional criteria included matching:

- jurisdiction (state);
- sector (government, Catholic or independent);
- type (primary, secondary, combined or college);
- student enrolment; and
- percentage of Indigenous students enrolled.

To enable as clear an identification of treatment effects as possible, any schools with staff who had attended SSLP were culled from the non-SSLC sample. Finally, advice was sought from departmental personnel in the selection of like schools for SSLC schools in Western Australia and the Northern Territory. Considerations for these schools included whether the communities had historical pastoral or missionary contact with white people, and saltwater, freshwater or desert location. A few schools did not have suitable similar schools listed on the My School web site. In this instance what ACARA refers to as

‘Local schools’ were scrutinised and selection made based on the aforementioned criteria and on similar ICSEA values.

The next sections focus specifically on the development and implementation of the both the Leader and the Teacher Survey instruments. For each instrument, the design, implementation and sample are reviewed. This is then followed with key descriptive findings on each sample.

3.1.2 Leader Survey Design, Implementation, Sample Population

Overall Design

The Leader Survey Instrument was designed to gather socio-demographic data on schools and their leaders. This includes basic personal and professional information, education and work experience. It samples school leaders’ differential uptake and implementation of Stronger Smarter messages. It documents how school leaders define and implement ‘what counts’ as: the Stronger Smarter focus on affirmative Indigenous identity, high expectations and educational outcomes for Indigenous students; Indigenous leadership in the school; Community/school engagement and participation; innovative school structure; innovative school staffing; and sustainability. It also profiles leaders’ reports of curriculum and pedagogy practices in their schools. A separate section asked them to describe and map SSLC network relationships between schools and participants.

Survey Administration

The Leader Survey was designed as a longitudinal instrument to be administered over three years. The first administration was in July 2010; the second and third administrations are planned for mid-year 2011 and 2012. Many respondents, therefore, would be repeating the survey at different junctures in SSLC; new Hub and Affiliate leaders would be added to the cohort as SSLC expanded. As per ethical protocols (See Appendix 2.3), participants were assigned a code and de-identified. All participants are assured confidentiality.

Sample

The sample population is a targeted cohort meeting at least one of the following criteria: school leader or SSLP graduate in an eligible school defined as any school in the SSLC Hub/Affiliate network; any school leader in all non-SSLC schools; and, for 2010 only, any person having completed the SSLP program since 2006 residing in any other type of school.

Leader Cohort

Participants included: SSLP graduates, SSLC hub and affiliate school leaders, and non-SSLC leaders. Following the original SSLP cohort definitions, school leaders were defined as: principals, deputy principals, heads of curriculum, specialist teachers and community leaders. All school leaders, either by title or by participation in SSLP, became part of the eligible survey sample.

Sample Response Rates

The Leader Survey school response rate for Hub Schools was 84% (n=21), for Affiliate schools 36% (n=28). The total Hub/Affiliated combined response rate was 48% (n=49). Non-SSLC schools in this sample were matched for *both* Hubs and Affiliates. Non-SSLC school response rate was 22% (n=35).

Table 3.2. Leader Survey Hub, Affiliate and Like School Response Rates

	Hub			Likes to Hubs			Affiliate			Like to Affiliate		
	School Response	Total Eligible School	Response Rate	School Response	Total Eligible School	Response Rate	Schools Response	Total Eligible School	Response Rate	Schools Response	Total Eligible School	Response Rate
QLD	8	8	100%	3	17	18%	10	24	42%	9	47	19%
NSW	8	9	89%	4	14	29%	7	29	24%	11	43	26%
VIC	2	2	100%	1	4	25%	2	6	33%	2	5	40%
TAS	1	1	100%	0	3	0%	1	2	50%	0	5	0%
NT	1	2	50%	1	3	33%	3	7	43%	0	0	0%
SA	1	1	100%	2	2	100%	1	3	33%	1	5	20%
WA	0	2	0%	0	3	0%	4	6	67%	1	6	17%
Totals	**21**	**25**	**84%**	**11**	**46**	**24%**	**28**	**77**	**36%**	**24**	**111**	**22%**

3.1.3 School Leader Descriptive Characteristics

SSLP graduates included in the SSLC school leader cohort include: community leaders, key teachers, Indigenous education workers and others. In contrast, non-SSLC school leaders were almost exclusively principals. Table 3.3 below shows that slightly over 26% (n=11) of the SSLC cohort consisted of leaders other than Principals and Deputy Principals. Of the overall cohort of Principals and Deputy Principals, 4% (n=4) are Indigenous.

Table 3.3 SSLC vs. non-SSLC School leaders position

		LSID_SSLC_LIKE - SSLC vs. Like			
		SSLC		Like	
		Count	Column N %	Count	Column N %
LSD_POSITION_R - Current Position (all recoded)	Principal	45	58.4%	31	88.6%
	Deputy Principal	12	15.69%	1	2.9%
	Teaching Principal	0	.0%	3	8.6%
	Teacher	0	.0%	0	.0%
	Other Leaders	20	26.9%	0	.0%

Reporting on Principals, Deputy Principals and Teaching Principals only – Table 3.4 below describes their overall levels of qualifications. There were no significant differences between

SSLC and non-SSLC schools in principals' qualifications. Approximately 23% (n=13) of all principals have Masters and above qualifications.

Table 3.4 SSLC vs. non-SSLC School leaders' qualifications

		LSID_SSLC_LIKE - SSLC vs. Like			
		SSLC		Like	
		Count	Column N %	Count	Column N %
LSD_EDCRED_R - Highest degree/ credential attained (recoded)	Less than 3 year bachelors	4	7.1%	2	5.9%
	3 year bachelors	12	21.4%	7	20.6%
	Full bachelors (4 years)	27	48.2%	17	50.0%
	Masters/ PhD	13	23.2%	8	23.5%

Furthermore, as noted in Table 3.5 below, there are no significant differences between SSLC and non-SSLC principals in terms of experience levels, with both cohorts with means of over 26 years of school teaching and/or administration experience.

Finding 1: There are generally high levels of experience and adequate levels of credentials for principals of schools in Indigenous contexts.

A key issue raised in Indigenous education policy has been the effects of high principal turnover in schools. Table 3.5 below compares SSLC versus non-SSLC principals' overall experience and duration of tenure in their current positions. Although there are no significant differences between SSLC and non-SSLC schools, several points are worth noting. First, the overall experience levels of principals are high. Second, their average duration of tenure in their current position is approximately five years, with most reporting a transfer since 2005. This would show the general effects of principal transfer patterns in state systems.

While it identifies a wide range of jurisdictional constraints, the conventional school reform literature suggests that at the least, a five year duration of tenure would be necessary to generate school renewal and set the conditions for sustainability (e.g., Riley & Seashore-Louis, 2000). As noted in Section 2 of this report, *the three qualitative cases presented suggest that five years would constitute a minimum duration of tenure to enable fundamental changes in school ethos and curriculum/pedagogy to generate substantive improvement and, even then, questions about the durability and sustainability of such gains remain.*

In SSLC schools 35% (n=20) of principals have been in their school for the past five years; 42% (n=24) have been in two schools. This suggests a bifurcated situation: many SSLC principals with sufficient duration of tenure, uninterrupted by transfer, to generate and maintain reform. This contrasts with a major proportion of the cohort who have moved over the past five years and had less opportunity to develop and sustain a reform agenda.

Table 3.5 SSLC vs. Non-SSLC Leaders' experience

	LSID_SSLC_LIKE – SSLC vs. Like			
	SSLC		Like	
	Mean	Standard Deviation	Mean	Standard Deviation
LSD_YRS_EDUCATION_N - Years worked in school/ education (coded)	26.06	8.56	28.49	6.64
LSD_YRS_SCHOOL_N - Years worked in current school (coded)	4.97	4.51	5.41	6.54
LSD_YRS_LEADER_N - Years worked in current (leader) role (coded)	5.14	4.28	5.59	5.81
LSD_SCH_HIST_2005_N - Number of schools worked at since 2005	2.04	1.07	2.43	1.50

Finding 2: While the transfer system is affecting continuity of tenure, approximately a third of SSLC principals have sufficient duration of tenure as principals to generate the conditions for reform.

3.1.4 Teacher Survey Design, Implementation, Sample Population

Overall Design

The Teacher Survey Instrument was intended to document teacher professional background and work history, and teacher self-report of school practices affiliated with core SSLC messages. Additional sections were developed to measure: teacher engagement with Indigenous community and culture; self-reported classroom practices in curriculum, instruction, pedagogy and assessment.

Survey Administration

The Teacher Survey is a cross-sectional instrument. The survey will be administered at least three times over the 3-year evaluation period, in 2010, 2011 and 2012. Although the Teacher Survey was not designed to be longitudinal, it is conceivable that a significant proportion of the sample population will retake the survey in subsequent year(s), providing a default quasi-longitudinal sub-sample through the tracking of individual participants. As per ethical protocols, participants were assigned a code and de-identified. All participants were assured confidentiality.

Sample

The sample population is a targeted cohort based on teacher placement in an SSLC Hub/Affiliate or a non-SSLC school. Teaching personnel are defined to include professional teaching staff only (e.g. classroom teacher, specialist teacher, curriculum heads, etc). This did not include semi-professional school personnel in teaching positions.

Sample Response Rates

The level of analysis was not the individual teacher but the school. The Teacher Survey school response rate was 60%. Of the 150 eligible schools targeted in the overall sample, 90 schools are represented with teacher participants. Of these schools, 72% (n=18) were Hub schools, 55% (n=44) Affiliate schools and 61% (n=28) Non-SSLC schools (refer Table 3.6).

Table 3.6 **Teacher Survey: Hub, Affiliate and Like School Response Rates**

	Hub			Affiliate			Non-SSLC		
	Schools Response	Total Eligible Schools	Response Rate	Schools Response	Total Eligible Schools	Response Rate	Schools Response	Total Eligible Schools	Response Rate
QLD	7	8	88%	13	25	52%	11	14	79%
NSW	5	9	56%	21	31	68%	12	17	71%
VIC	1	2	50%	3	6	50%	2	4	50%
TAS	1	1	100%	1	2	50%	1	3	33%
NT	1	2	50%	3	7	43%	0	3	0%
SA	1	1	100%	0	3	0%	2	2	100%
WA	2	2	100%	3	6	50%	0	3	0%
Total	**18**	**25**	**72%**	**44**	**80**	**55%**	**28**	**46**	**61%**

3.1.5 Teacher Characteristics

57% (n=218) of the teacher population identified themselves as secondary teachers and 43% (n=164) identified as primary school teachers. In the 7 composite schools, teachers self-nominated whether they were primary or secondary.

Table 3.7 below provides an overview of the Teacher sample. The population is 96% (n=367) non-Indigenous; 88% (n=336) were born in Australia; and 98% (n=374) reporting that their primary language at home was English.

Table 3.7 **Demographic Overview of Teachers Sample**

SSLC Non-SSLC (N=382)	AGE M (sd)	A/TSI M (sd)	Gender M (sd)	Yrs in Teaching Role M (sd)	Yrs in Current School M (sd)	No. of Schools since 2005 M (sd)	Yrs teach Indigenous population M (sd)	Courses on Indigenous Issues
71% (n=271) SSLC 29% (n=111) non-SSLC	41 years (11.72)	3.5% (n=13)	M=31% (n=119) F=69% (n=263)	13.90 (11.25)	5.80 (5.97)	2.16 (1.79)	10.46 (9.51)	29% Yes (N=111)

The average age of the teaching workforce is 41 years: 30% (n=115) of the teachers are aged between 22-30; 36% (n=138) between 47-65. In terms of overall experience teaching in schools with Indigenous education: 25% (n=96) of teachers have more than 17 years experience; 25% (n=96) between 8-17 years of experience; approximately 25% (n=96) have less than three years of experience. This suggests that half of the teachers have extensive prior experience teaching Indigenous students; and approximately a quarter of the workforce are relatively new to teaching.

Finding 3: The levels of overall experience in Indigenous education contexts of the teaching workforce sampled are relatively high.

This appears to conflict with the common stereotype that schools with Indigenous students are predominantly staffed with young, inexperienced teachers.

Regarding prior training, 29% (n=11) of the total cohort stated that they had taken courses or programs in Indigenous education; the overwhelming majority (83%; n=317) of those who report having had training are from SSLC schools; 71% (n=271)of the overall cohort stated that they had no prior training courses, pre or in-service on Indigenous issues were inadequate. Prior training listed included pre-service teacher education courses, in-service seminars, and ESL/D courses, including SSLP.

Finding 4: A majority of teachers sampled reported a lack of sufficient pre and in-service training preparation in Indigenous education.

As noted in Table 3.8 below, there are no significant differences between SSLC and non-SSLC schools in teacher experience, years working in current school, years in Indigenous education, and overall number of schools since 2005.

Table 3.8 SSLC vs. non –SSLC Teacher experience and tenure

	TSID_SSLC_LIKE - SSLC vs. Like			
	SSLC		Like	
	Mean	Standard Deviation	Mean	Standard Deviation
TSD_YRS_TEACH_N - Years worked as a teacher (coded)	14.51	11.28	12.37	11.09
TSD_YRS_SCHOOL_N - Years worked in current school (coded)	6.02	6.25	5.28	5.23
TSD_YRS_TEACH_INDIG_N - Years worked in school with Indigenous population (coded)	10.88	9.79	9.31	8.63
TSD_SCH_HIST_2005_N - Number of schools worked at since 2005	2.22	1.92	2.02	1.40

In the last five years, 45% (n=172) of the sample report having worked only in their current school; 29% (n=111) of teachers report having shifted once. That is, 74% (n=283) of teachers in this sample have either never moved or moved only once in the last five years.

This appears to conflict with the stereotype that the ‘churn factor’ of high levels of teacher mobility and movement is endemic in Indigenous education.

3.1.6 Summary

At the core of current policy debates have been a number of popular claims about the principals and teachers working in schools engaged in Aboriginal education. The demographic data from the survey instruments suggests that some of these claims may be based on anecdote and overgeneralisation.

In terms of principals, there were no significant differences between SSLC and non-SSLC principals in background, experience or duration of tenure. As could be expected, principals clearly have extensive experience in school education; and their overall credential levels, with about a quarter of the workforce with Masters or higher degrees, is adequate. It is worth noting that by comparative international standards the general level of teacher and administrators' credential levels lags behind countries like Canada and Finland, where Masters degrees are entry level requirements (e.g., Ponte, Nusche & Moorman, 2008).

However, the various state government transfer systems may have a detrimental effect on school reform efforts. While these systems vary, in most states the incentive and points systems affiliated with rural/remote placement generally are accrued by principals, enabling them to transfer to metropolitan environments.

While there are no significant differences between SSLC and non-SSLC principals in terms of duration of tenure at schools – approximately a third had been in a school for a full five-year period. As noted above, and exemplified in the qualitative case studies presented in Part 1 of this report, the *five-year duration would be necessary* for durable and sustained changes in school ethos, curriculum and pedagogy, and related improvement in student achievement. Any system that is transferring principals every two or three years would make implementation of Stronger Smarter or any other reform agenda difficult.

In terms of the teacher workforce – the data here questions several popular misconceptions. The general transfer patterns appear to be similar – with SSLC and non-SSLC teachers reporting a mean of over 2 schools worked in since 2005. But the popular belief that schools engaged in Indigenous education are revolving doors for new teachers, with high levels of inexperienced staff and high levels of staff turnover does not appear to be true. The combined SSLC and non-SSLC teaching workforce has high levels of prior experience in schools with Indigenous students. Approximately a quarter of the workforce sample has less than 3 years of teaching experience.

At the same time, there was a very strong teacher view (71%; n=271) that their pre-service training was inadequate. Further, less than a third of the sample reporting that they had taken seminars, approaches and courses on Indigenous education. Here, SSLC schools appeared to be making a better effort in providing in-service training on Indigenous education issues.

3.2 Measurement models

This report details the development and validation of scales to measure latent constructs that map to the Stronger Smarter tenets. A brief description of the process and findings is presented. For an in-depth discussion of the process and models refer to Appendices 3.2 and 3.4.

3.2.1 The Constructs

Constructs are latent variables that can only be measured indirectly, through their effects on manifest variables. Therefore, it is important to ensure the manifest variables map the underlying construct in a valid and reliable way. This can be achieved in a variety of ways. The approach employed in this project is to use structural equation modelling (SEM) to build measurement models that articulate the magnitude and direction of the effect of the construct on the manifest variables. These models are then validated and used to build indexes that attempt to assign a specific value to a person on the construct of interest.

Before measurement models can be specified it is essential the constructs are defined carefully through a process of shared understanding with stakeholders combined with theoretical underpinnings based on the research literature. The operational definitions of the constructs are discussed below.

Two surveys were administered, one to document leaders' perspectives and another to document teachers' perspectives. Both surveys attempted to capture responses to Stronger Smarter messages; some constructs were common to both groups, while others were not. In what follows, we discuss each construct, noting similarities and differences between the leaders' and teachers' surveys.

3.2.1.1 Indigenous School Ethos

The construct Indigenous School Ethos attempts to map school climate and the degree to which is it is supportive of Indigenous ideas, knowledge and ways of understanding. The aim here was to document the interpretation and uptake of what Sarra (2005) termed "positive Aboriginal identity". This construct was mapped by 4 items in the teacher survey and 5 items in the leader survey.

3.2.1.2 Community Engagement

The construct Community Engagement attempts to gauge the degree to which school strategies reach into the community, as well as levels of involvement of community members in the school. It attempts to map uptake and self-reported practices relating to the Stronger Smarter message around engagement with Indigenous community.

The Community Engagement construct was mapped by 9 items in the teacher survey and 7 items in the leader survey. The construct was found to split into two uni-dimensional factors. One factor was primarily concerned with the governance relationship between the school and the community: that is, the degree to which Indigenous community members were substantively involved in school decision-making and policy formation. The other was a more generic representation of community involvement in school and classroom matters. These constructs were labelled "School Governance and Community" and "School Community Engagement" respectively.

3.2.1.3 High Expectations Leadership

High Expectations Leadership is based on the premise that the promotion of high expectations for Indigenous students is the responsibility of teachers and school leaders. In the Stronger Smarter approach, High Expectations for Indigenous students is a core strategy purported to have direct positive effects on teacher-student relationships and student outcomes.

The High Expectations Leadership construct was mapped by 8 items in the teacher survey and 7 items in the leader survey. The construct was found to split into two uni-dimensional factors. One factor was primarily concerned with extrinsic factors to promote High Expectation Leadership in the school, e.g., mentoring staff and promotion of discourses around high expectations and achievement for Indigenous students at staff meetings. The second factor was more closely aligned with how High Expectations Leadership was operationalised in school and classroom practice. These constructs were labelled "Promoting High Expectation Leadership" and "High Expectation Leadership Enactment" respectively.

3.2.1.4 Indigenous Leadership

Indigenous leadership as a construct refers to the recognition and influence of Indigenous community members, staff and students in leadership roles within the school. The leadership items demonstrate an attempt to gauge the status of Indigenous leaders within the school in terms of formal and informal leadership positions. In addition, other items document whether Indigenous expertise is incorporated into school practices such as curriculum selection and development, and staff professional development. This construct was mapped by 4 items in teacher survey and 6 items in the leader survey. The construct was found to split into two factors in the leaders survey, which were named Indigenous Leadership (Teaching) and Indigenous Leadership (Roles).

3.2.1.5 Indigenous Cultural Knowledge

This construct attempts to gauge the level to which school staff have a working knowledge of Indigenous culture, geography and history. This measure was mapped by 4 items.

Innovative School Staffing

This measure refers primarily to "innovative "and "dynamic" practices to source Indigenous experience and expertise from the Indigenous and non Indigenous communities. The measure was found to split into two factors in the leader's survey, which were named Innovative School Staffing (Recruitment) and Innovative School Staffing (Capacity and Capacity Building).

Innovative School Modelling

This measures the degree to which a school modifies its operational approach to better match the educational needs of Indigenous students. This measure was mapped by three items in the leader survey.

Sustainability

This measure attempts to gauge the degree to which resources are allocated to help maintain priorities and direction of education for Indigenous students and plumbs the conditions for maintenance of current capacity. This measure was mapped by two factors each with four items: Teacher Capacity and Systemic Capacity.

3.2.2 The Process

The workflow for the production of the final index followed the steps outlined:

- Construct definition
- Item generation
- Establishment of face validity

- Descriptives and missing data treatment
- Exploratory factor analysis (EFA) – factor identification
- Confirmatory factor analysis (CFA) – single factor congeneric measurement model specification
- Checking for parsimony
- Reliability and validity checking
- Production of index to quantify construct

The workflow was modified in the case of the Indigenous Cultural Knowledge construct. EFA was replaced with Principal Components Analysis (PCA) and the CFA with a partial credit Rasch model. The reason for the change in approach is detailed in the section describing the generation of the construct in Appendix 3.1.5.

Constructs were defined using an iterative process driven by extensive review of the research literature and consultation with stakeholders. Items were then generated that mapped the level of the construct across a 9-point Likert scale. While the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991). A 9 point scale was chosen to maximise sensitivity and to bolster the claim for interval level of measurement (Binder, 1984; Zumbo & Zimmerman, 1993) .

Items were reviewed by SSLC and SSLP staff, the IERG and IRG. The items were then piloted with focus groups of Queensland school leaders and teachers with prior experience in Indigenous education. This process ensured a high degree of face validity for the item clusters as the first step in establishing construct validity.

Item distributions were subjected to descriptive analysis as part of the data cleaning process. Any items displaying lack of variance, skewness or kurtosis were identified. This information was used to drive decisions with respect to model and factor extraction. Where the data deviated from a multi-normal distribution bootstrapping techniques were used to estimate parameters thus ensuring correct estimation of confidence limits. Missing data analysis was conducted and reported. Where appropriate Bayesian Multiple Imputation techniques were used to impute missing values within item sets.

As the scales were not based on any previously developed scales, exploratory factor analysis was conducted on each item set to establish the form of the factor structure mapped by the items. This process was used to select items that appeared to map to underlying uni-dimensional constructs. Items identified in the EFA as possibly supporting a factor were tested for model fit using CFA. Single factor congeneric measurement models were constructed to validate each construct and compute composite scale scores. Where a congeneric model was shown to fit it was tested against the parallel equivalent and Tau equivalent models and the most parsimonious solution selected.

Chi square goodness of model fit statistics were generated for each model and used as the prime decision mechanism for model acceptance or rejection. The decision to accept or reject the model was also informed by the examination of absolute fit and comparative fit indices. In particular the Root-Mean-Square Error of Approximation (RMSEA), Goodness-Of-Fit Index (GFI), Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI) were calculated and reported for each model.

Reliability and validity indicators were calculated and published for each model. Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement models. Traditional measures do not take into account the congeneric nature of the model; i.e. they assume either a Tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures.

In recognition of this issue four model specific measures of reliability that do not assume equal factor loadings were calculated; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989).

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha, it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981).

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981).

Coefficient H (Hancock & Mueller, 2001) can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently, the coefficient will always be larger than the item reliability of the single best indicator variable. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. Values above 0.8 are considered to indicate high reliability (Hancock & Mueller, 2001).

Construct validity can be defined in a variety of ways. In the context of a measurement model it can be considered to consist of two parts: face validity and logical validity. Face validity was established as part of the item selection and piloting process already described. Logical validity can be demonstrated through the acceptance of the congeneric measurement model as the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality. The goodness of fit measures, therefore, can be viewed as testing logical validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates was used to test this significance.

A scale score for each construct that takes into account individual and joint measurement error was computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing. This approach ensures the estimates of the scale score adjusted for measurement error are proportionally weighted by the actual contribution made by each indicator. The proportional regression weight scores summary to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same 'metric' as that of indicators for the construct.

3.2.3 The Measurement Models

The measurement models, fit statistics, reliability estimates, validity estimates and scale score formula are presented for each construct. Where more than one factor emerged from the item analysis separate uni-dimensional constructs were preferred over alternative multi-dimensional models unless under identification became a problem. All congeneric models were compared with their nested parallel equivalent and Tau equivalent counterparts using a chi square difference test and the most parsimonious solution selected. A detailed description of the model generation process can be found in Appendices 3.2 and 3.4.

The following cut offs were applied when judging model fit, reliability and validity parameters: Chi Squared Goodness of Fit (p >0.05), Bollen-Stein bootstrap (p>.05), RMSEA (<0.05), GFI (>0.95), TLI (>0.95), CFI (>0.95), SMC (>0.5), construct reliability (>0.5), variance extracted (>0.5), coefficient H (>0.8) and convergent validity (p<0.05).

3.2.4 Teacher Survey Constructs

3.2.4.1 Indigenous School Ethos construct

Item Set and Model

The item set used to map the construct "Indigenous School Ethos" is listed in Table 3.9.

Table 3.9 Indigenous School Ethos Item Set

Item	Description
TSII2	Our school adopt pedagogies that are sensitive to Indigenous students' ways of knowing.
TSII4	Indigenous signs and symbols (e.g., art work, student murals) are displayed in our classrooms.
TSII5	Our classes actively participate in Indigenous events.
TSII6	Indigenous people participate in and/or advise on class events.

A diagrammatic representation of the fitted model illustrating standardised parameters is represented by Figure 3.1.

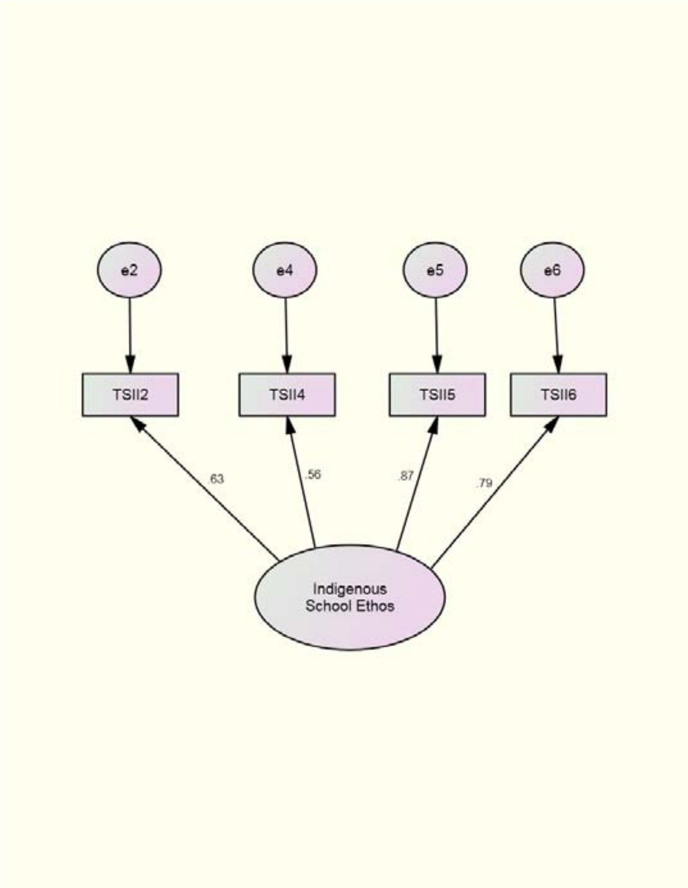

Figure 3.1 **Indigenous School Ethos Structural Equation Measurement Model**

The model converged and was a good fit. The factor coefficients ranged from a low of 0.56 to a high of 0.87.

In summary - a one factor congeneric model of the latent construct Indigenous School Ethos was specified as a latent variable with 4 reflective indicators. The data fit the model well χ^2 (2) = 3.294, p= .193, RMSEA = .059 (.000, .170), GFI = .911, TLI = .984 and CFI = .995.

The model was tested against the equivalent and Tau equivalent models and found to be the most parsimonious solution.

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the Indigenous School Ethos factor were TS112 (.398), TS114 (.310), TS115 (.765) and TS116 (.621). TS115 and TS116 are above the "good" cut-off while TS112 and TS114 are above the acceptable cut off (Fornell & Larcker, 1981). In summary, the Indigenous School Ethos factor is explaining between 31% and 77% of the variance across the individual indicator variables.

The construct reliability for the Indigenous School Ethos factor is .81; well above the recommended cut off.

The variance extracted from the indicators by the Indigenous School Ethos factor was.52. In other words the factor is accounting for 52% of the variation in the indicator variables, which is just above the recommended cut off of 50%.

The coefficient H value for the Indigenous School Ethos model was .855, which represents a high reliability.

The Indigenous School Ethos model fitted well as confirmed by the non-significant χ^2 supporting the claim for construct validity.

The critical ratios for the indicator variables were TS112 (8.835), TS114 (7.595), TS115 (13.212) and TS116 (11.590) all of which are significant at the .05 level which support a claim for convergent validity. It is also recommended that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .63, .56, .87 and .79. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

In summary, the Indigenous School Ethos construct would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the Indigenous School Ethos construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.10).

Table 3.10 Indigenous School Ethos Regression Weights

	TS112	TS114	TS115	TS116
Raw regression weights	.063	.041	.209	.112
Proportional regression weights	.148	.096	.492	.264

The scale score then becomes:

Indigenous School Ethos index = (TS112*.148) + (TS114*.096) + (TS115*.492) + (TS116*.264)

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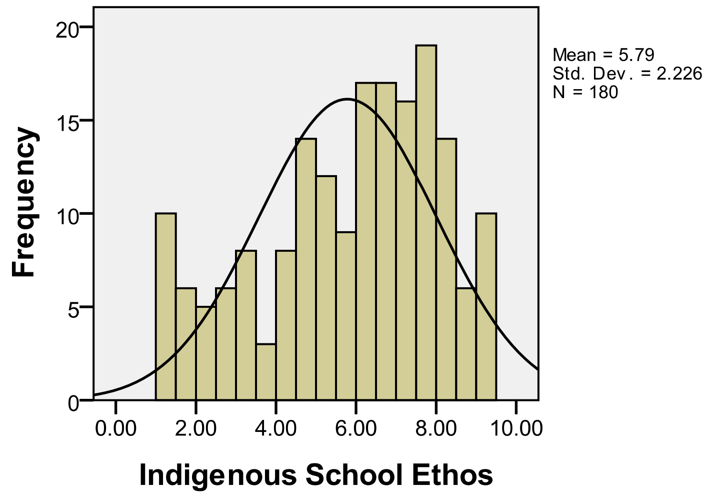


Figure 3.2 Indigenous School Ethos Histogram

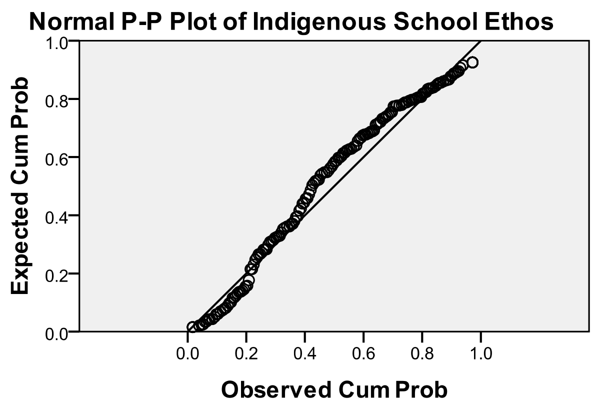


Figure 3.3 Normal P-P Plot of Indigenous School Ethos

Both the histogram (Figure 3.2) and the normal P-P plot (Figure 3.3) of the Indigenous School Ethos index would indicate that at the meta-level the distribution of scores across the sample provides sufficient variance and appropriate distribution shape to allow it to be used in comparative studies within the sample.

3.2.4.2 Community Engagement Construct

The Community Engagement construct was mapped by 9 items. The construct was found to split into two uni dimensional factors. One factor was primarily concerned with the governance relationship between the school and the community and the other was a more generic representation of community involvement in school and classroom matters. These constructs were labelled "School Governance and Community" and "School Community Engagement" respectively.

3.2.4.3 School Governance and Community construct

Item Set and Model

The item set used to map the construct “School Governance and Community” is listed in Table 3.11.

Table 3.11 School Governance and Community Construct Item Set

Item	Description
TSCE6	Indigenous community members are consulted on major decisions about the direction of the school.
TSCE7	Indigenous community priorities are taken into account as part of the school planning process.
TSCE8	Indigenous community members have a voice in the everyday running of the school.
TSCE9	School staff have significant roles in meetings and events that involve the Indigenous community.

A diagrammatic representation of the fitted model illustrating standardised parameters is represented by Figure 3.4.

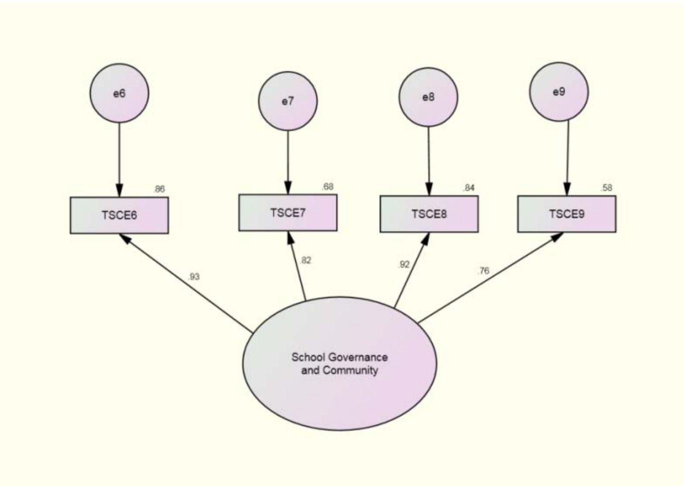


Figure 3.4 School Governance and Community Construct Structural Equation Measurement Model

The model converged and was a good fit. The factor coefficients ranged from a low of .76 to a high of .93.

In summary - a one factor congeneric model of the latent construct Community Engagement Factor 1 was respecified as a latent variable with 4 reflective indicators. The data fit the model well Bollen-Stine bootstrap p = 0.441, RMSEA = .115 (.025, .216), GFI = .983, TLI = .974 and CFI = .991.

The model was tested against the equivalent and Tau equivalent models and found to be the most parsimonious solution.

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the School Governance and Community factor were TSCE6 (.86), TSCE7 (.68), TSCE8 (.84) and TSCE9(.58) - all are above the "good" cut-off (Joreskog & Sorbom, 1989) . In summary the School Governance and Community factor is explaining between 58% and 86% of the variance across the individual indicator variables.

The construct reliability for the School Governance and Community factor is .91; well above the recommended cut off (Fornell & Larcker, 1981).

The variance extracted from the indicators by the School Governance and Community factor was .76. In other words the factor is accounting in total for 76% of the variation in the indicator variables which is well above the recommended cut off of 50% (Fornell & Larcker, 1981).

The coefficient H value for the School Governance and Community factor model was .94 which represents a high reliability (Hancock & Mueller,2001) .

The School Governance and Community model fitted well as confirmed by the non-significant Bollen-Stine bootstrap *p* thus supporting the claim for construct validity.

The critical ratios for the indicator variables were TSCE6 (NA), TSCE7 (15.536), TSCE8 (19.726) and TSCE9 (13.288) - all of which are significant at the .05 level, which support a claim for convergent validity. All factor loadings are above .7 further strengthening the claim for convergent validity.

In summary, the School Governance and Community construct would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the School Governance and Community construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.8).

Table 3.8 **School Governance and Community Regression Weights**

	TSCE6	TSCE7	TSCE8	TSCE9
Raw regression weights	.380	.153	.345	.102
Proportional regression weights	.388	.156	.352	.104

The scale score then becomes:

School Governance and Community index = (TSCE6*.388) +(TSCE7*.156) + (TSCE8*.352) + (TSCE9*.104)

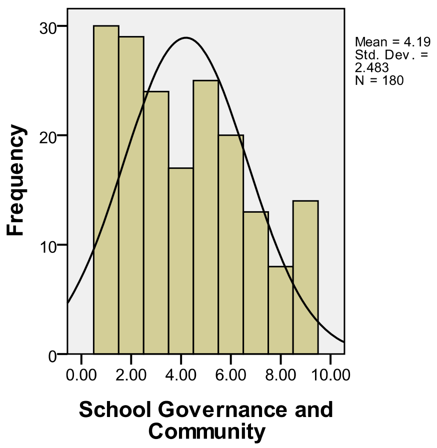


Figure 3.5 **School Governance and Community Histogram**

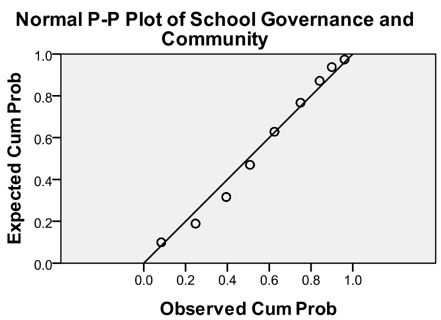


Figure 3.6 **School Governance and Community P-P Plot**

Both the histogram (Figure 3.5) and the normal P-P plot (Figure 3.6) of the School Governance and Community index would indicate that at the meta-level the distribution of scores across the sample provide sufficient variance and appropriate distribution shape to allow it to be used in comparative studies within the sample.

3.2.4.4 School Community Engagement construct

Item Set and Model

The item set used to map the construct "School Community Engagement" is listed in Table 3.13

Table 3.13 School Community Engagement Item Set

Item	Description
TSCE1	Indigenous community members participate in classroom teaching or student learning.
TSCE2	There is a program to encourage Indigenous community members to become actively involved in the school.
TSCE3	I involve Indigenous community members in my classroom.
TSCE4	An outreach program is maintained to reach out to Indigenous parents/caregivers who do not visit the school.
TSCE5	Indigenous community members meet regularly with school governance boards (e.g., councils and leadership groups, P&C/P&F committees).

A diagrammatic representation of the fitted model illustrating standardised parameters is represented by Figure 3.7.

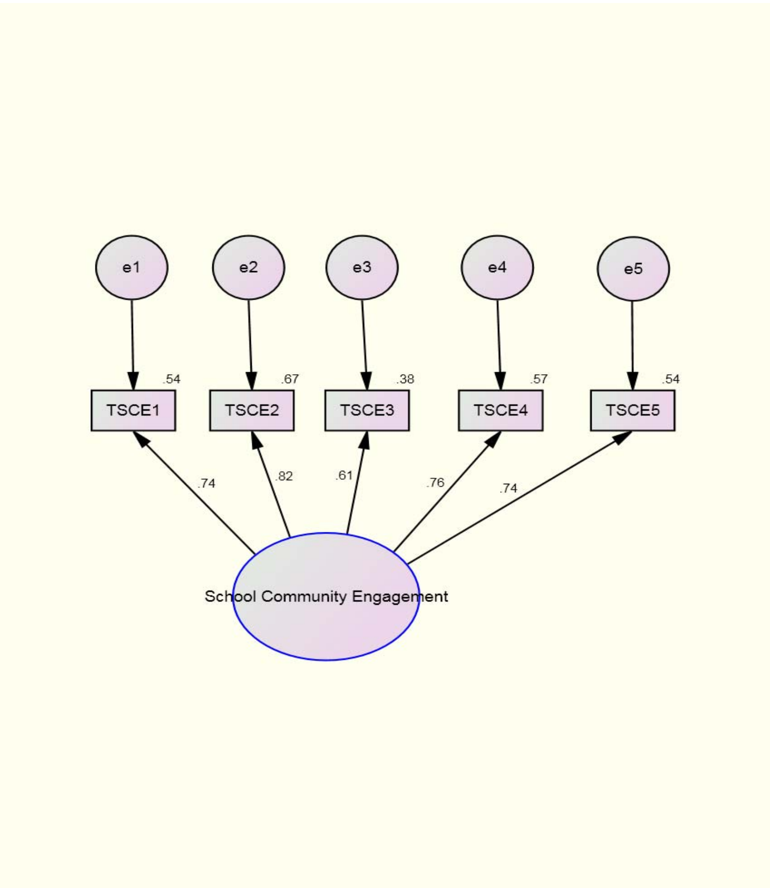


Figure 3.7 School Community and Engagement Structural Equation Measurement Model

The model converged and was a good fit. The factor coefficients ranged from a low of .61 to a high of .82.

In summary - a one factor congeneric model of the latent construct School Community Engagement was specified as a latent variable with 5 reflective indicators. The data fit the model well Bollen-Stine bootstrap p = 0.183, RMSEA = .128 (.071, .190), GFI = .961, TLI = .921 and CFI = .960.

The model was tested against the equivalent and Tau equivalent models and found to be the most parsimonious solution.

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the School Community Engagement factor were TSCE1 (.541), TSCE2 (.675), TSCE3 (.378), TSCE4(.571) and TSCE5(.543) - all are above the "good" cut-off except TSCE3 which is in the acceptable range (Joreskog & Sorbom, 1989) . In summary, the School Community factor is explaining between 38% and 68% of the variance across the individual indicator variables.

The construct reliability for School Community Engagement Factor is .82; above the recommended cut off (Fornell & Larcker, 1981).

The variance extracted from the indicators by the School Community Engagement factor was .54. In other words the factor is accounting in total for 54% of the variation in the indicator variables which is above the recommended cut off of 50% (Fornell & Larcker, 1981).

The coefficient H value for the School Community Engagement model was .87 which represents a high reliability (Hancock & Mueller, 2001) .

The School Governance and Community model fitted well as confirmed by the non-significant Bollen-Stine bootstrap p thus supporting the claim for construct validity.

The critical ratios for the indicator variables were TSCE1 (9.378), TSCE2 (10.38), TSCE3 (7.785), TSCE4 (NA) and TSCE5 (9.343) - all of which are significant at the .05 level which support a claim for convergent validity. All factor loadings are close to or above .7 further strengthening the claim for convergent validity.

In summary, the School Community Engagement construct would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the School Community Engagement construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.10).

Table 3.10 Community School Engagement Regression Weights

	TSCE1	TSCE2	TSCE3	TSCE4	TSCE5
Raw regression weights	.736	.821	.614	.755	.737
Proportional regression weights	.201	.224	.168	.206	.201

The scale score then becomes:

Community School Engagement index = (TSCE1*.201) + (TSCE2*.224) + (TSCE3*.168) + (TSCE4*.206) + (TSCE5*.201)

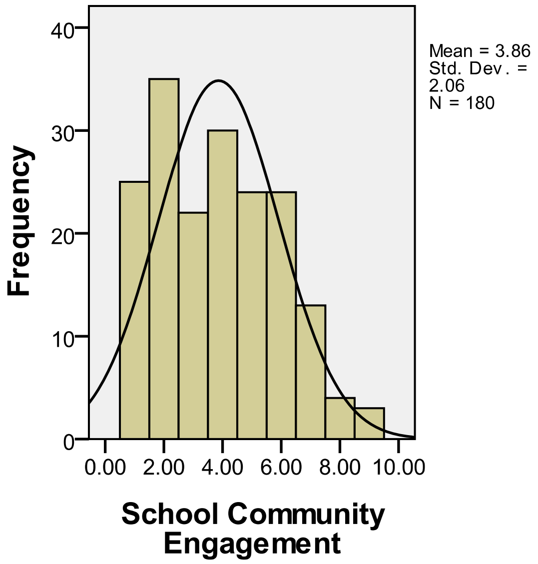


Figure 3.8 **Community School Engagement Index Histogram**

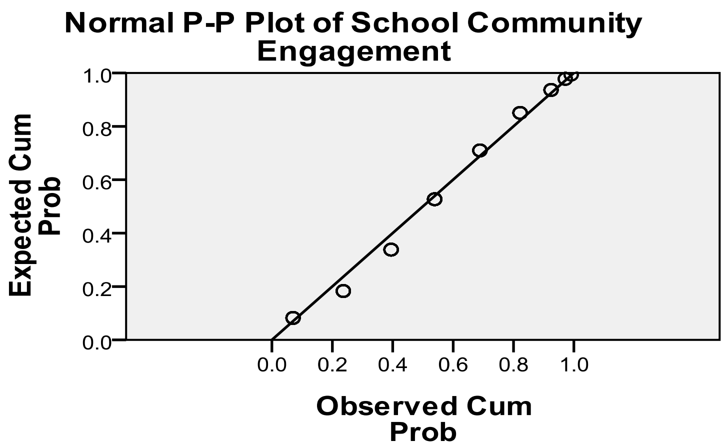


Figure 3.9 **Community School Engagement Index P-P Plot**

Both the histogram (Figure 3.8) and the normal P-P plot (Figure 3.9) of the Community School Engagement index would indicate that at the meta-level the distribution of scores across the sample provides sufficient variance and appropriate distribution shape to allow it to be used in comparative studies within the sample.

3.2.4.5 High Expectations Leadership construct

The High Expectations Leadership construct was mapped by 8 items. The construct was found to split into two uni dimensional factors. One factor was primarily concerned with extrinsic factors to promote High Expectation Leadership in the school e.g. mentoring staff and promotion of the values at staff meetings. The second factor was more closely aligned with how High Expectations Leadership was operationalised in the school. These constructs were labelled “Promoting High Expectation Leadership” and “High Expectation Leadership Enactment” respectively.

3.2.4.6 Promoting High Expectation Leadership construct

Item Set and Model

The item set used to map the construct “Promoting High Expectations Leadership” is listed in Table 3.15.

Table 3.15 **Promoting High expectations Leadership Item Set**

Item	Description
TSHEL3	High expectations for Indigenous student learning are promoted in staff meetings
TSHEL4	Staff are mentored in the importance of setting high expectations for Indigenous students
TSHEL5	The school staff takes collective responsibility for unlocking potential in Indigenous students
TSHEL7	Parents of Indigenous students are consulted about high expectations for their children

A diagrammatic representation of the fitted model illustrating standardised parameters is represented by Figure 3.10.

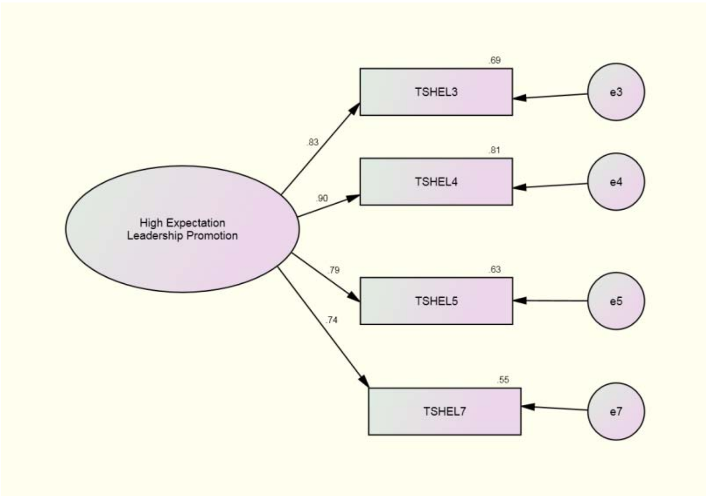


Figure 3.10 **Promoting High Expectations Leadership Structural Equation Measurement Model**

The model converged and was a good fit. The standardised factor coefficients ranged from a low of .743 to a high of .901.

In summary - a one factor congeneric model of the latent construct Promoting High Expectations Leadership was specified as a latent variable with 4 reflective indicators. The data fit the model well χ^2 (2)= 4.177, *p*= .124, RMSEA = .064 (.000, .153), GFI = .992, TLI = .989 and CFI = .996.

The model was tested against the equivalent and Tau equivalent models and found to be the most parsimonious solution.

Validity and Reliability Measures

The SMCs for the indicator variables mapped by Promoting High Expectations Leadership factor were TSHEL3 (.691), TSHEL4(.811), TSHEL5 (.625) and TSHEL7 (.552). All items are above the "good" cut-off (Joreskog & Sorbom, 1989) . In summary the Promoting High Expectations Leadership factor is explaining between 55% and 81% of the variance across the individual indicator variables.

The construct reliability for Promoting High Expectations Leadership factor is .89; above the recommended cut off of 0.5 (Fornell & Larcker, 1981).

The variance extracted from the indicators by the Promoting High Expectations Leadership factor was .67. In other words the factor is accounting in total for 67% of the variation in the indicator variables which is above the recommended cut off of 50% (Fornell & Larcker, 1981).

The coefficient H value for the Promoting High Expectations Leadership model was .91 which represents a high reliability (Hancock & Mueller, 2001).

The Promoting High Expectations Leadership model fitted well as confirmed by the non-significant χ^2 supporting the claim for construct validity

The critical ratios for the indicator variables were TSHEL3 (15.975), TSHEL4 (18.044), TSHEL5 (14.843) and TSHEL7 (13.587) - all of which are significant at the .05 level, which support a claim for convergent validity. All factor loadings are above .7 further strengthening the claim for convergent validity.

In summary, the Promoting High Expectations Leadership construct would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the Promoting High Expectations Leadership construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.16).

Table 3.16 Promoting High Expectations Leadership Regression Weights

	TSHEL3	TEHEL4	TSHEL5	TSHEL7
Raw regression weights	.108	.174	.079	.062
Proportional regression weights	.255	.411	.187	.147

The scale score then becomes:

Promoting High Expectations Leadership index = (TSHEL3*.255) + (TSHEL4*.411) + (TSHEL5*.187) + (TSHEL7*.147)

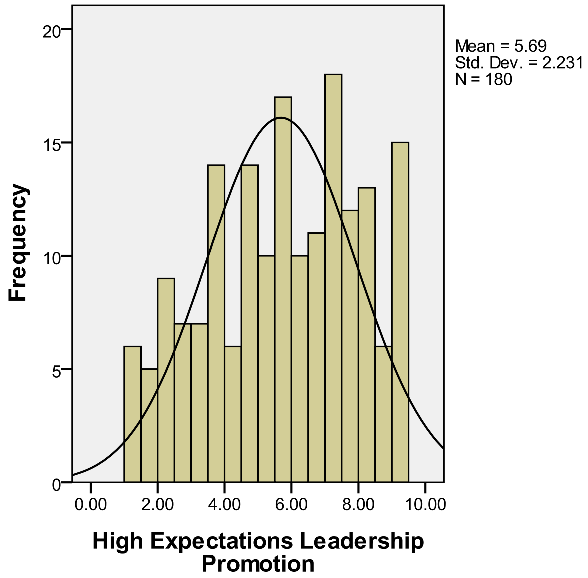


Figure 3.11 **Promoting High Expectations Leadership Histogram**

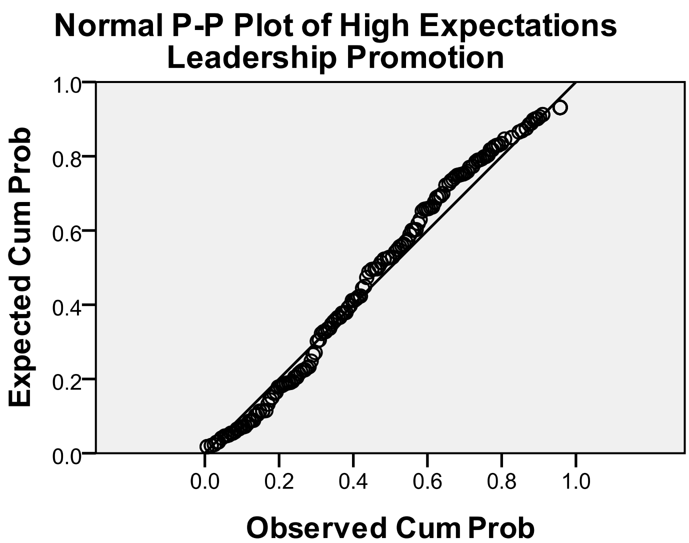


Figure 3.8 **Promoting High Expectations Leadership P-P Plot**

Both the histogram and the normal P-P plot of the Promoting High Expectations Leadership index would indicate that at the meta-level the distribution of scores across the sample provide sufficient variance and appropriate distribution shape to allow it to be used in comparative studies within the sample.

3.2.4.7 High Expectation Leadership Enactment construct

Item Set and Model

The item set used to map the construct "High Expectation Leadership Enactment" is listed in Table 3.17.

Table 3.17 High Expectation Leadership Enactment Item Set

Item	Description
TSHEL1	Indigenous students are challenged to achieve their potential
TSHEL2	High expectations for Indigenous student achievement are promoted in school policies
TSHEL6	High expectations for Indigenous student learning are embedded in my classroom context

A diagrammatic representation of the fitted model illustrating standardised parameters is represented by Figure 3.13. This model is just identified therefore model fit statistics will not be able to be generated.

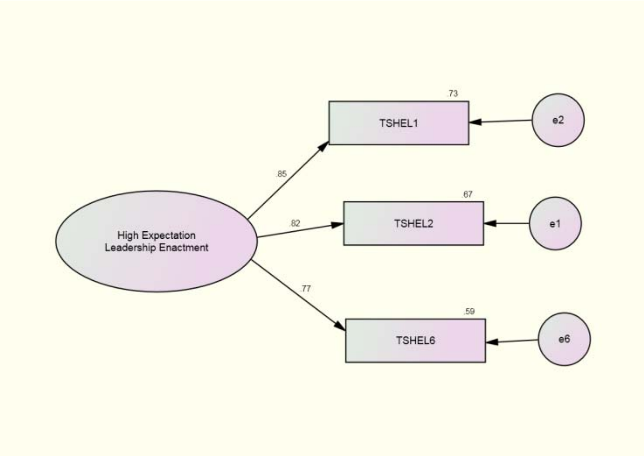


Figure 3.13 High Expectation Leadership Enactment Structural Equation Measurement Model

While fit statistics cannot be calculated the standardised regression weights ranged from 0.77 to .85 (p<0.05), which is good. The squared multiple correlations ranged from .59 to .73, which is adequate. The error variances range from 1.1 to 1.7, which is very good. Cronbach alpha was 0.852 which is very good given the scale is mapped by only 3 items.

In summary while fit statistics could not be calculated the other parameters listed all suggest the items map the construct well.

Validity and Reliability Measures

The SMCs for the indicator variables mapped by High Expectation Leadership Enactment factor were TSHEL1 (.731), TSHEL2 (.666) and TSHEL6 (.586). All items are above the "good" cut-off of .5 (Joreskog & Sorbom, 1989) . In summary the Promoting High Expectations Leadership factor is explaining between 59% and 73% of the variance across the individual indicator variables.

The construct reliability for High Expectation Leadership Enactment factor is .86; above the recommended cut off of 0.5 (Fornell & Larcker, 1981).

The variance extracted from the indicators by the High Expectation Leadership Enactment factor was .66. In other words the factor is accounting in total for 66% of the variation in the indicator variables which is above the recommended cut off of 50% (Fornell & Larcker, 1981).

The coefficient H value for the High Expectation Leadership Enactment model was .86 which represents a high reliability (Hancock & Mueller, 2001).

The critical ratios for the indicator variables were TSHEL1 (15.693), TSHEL2 (14.798), and TSHEL6 (13.676) - all of which are significant at the .05 level, which support a claim for convergent validity. All factor loadings are above .7 further strengthening the claim for convergent validity.

In summary, the Promoting High Expectations Leadership construct would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the High Expectation Leadership Enactment construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.18).

Table 3.18 High Expectation Leadership Enactment Regression Weights

	TSHEL1	TSHEL2	TSHEL6
Raw regression weights	.220	.152	.128
Proportional regression weights	.440	.304	.256

The scale score then becomes:

High Expectation Leadership Enactment index = (TSHEL1*.440) + (TSHEL2*.304) + (TSHEL6*.256)

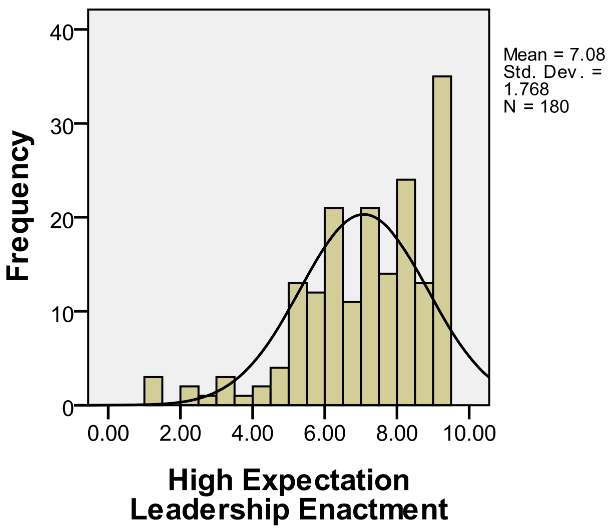


Figure 3.10 High Expectation Leadership Enactment Histogram

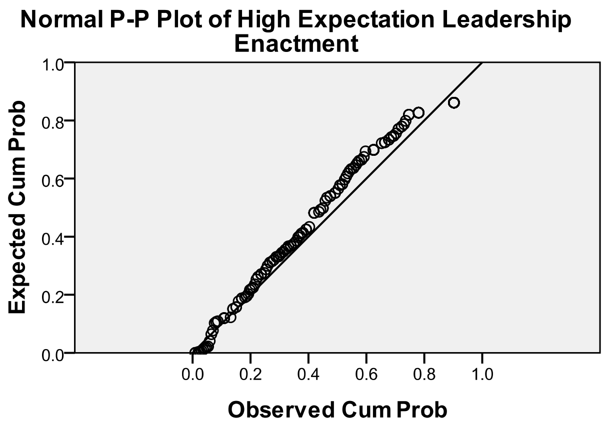


Figure 3.15 **High Expectation Leadership Enactment P-P Plot**

Both the histogram Figure 3.10 and the normal P-P plot Figure 3.15 of the High Expectations Leadership Enactment index would indicate that at the meta-level the distribution of scores across the sample provides sufficient variance and appropriate distribution shape to allow it to be used in comparative studies within the sample.

3.2.4.8 Indigenous Leadership construct

Item Set and Model

The item set used to map the construct "Indigenous Leadership" is listed in Table 3.19.

Table 3.19 **Indigenous Leadership Item Set**

Item	Description
TSIL2	Indigenous community members are involved in curriculum planning.
TSIL6	Indigenous staff hold committee positions in the school.
TSIL7	Indigenous community members hold committee positions on governance boards (e.g., councils and leadership groups).
TSIL8	Indigenous community members involved with the school mentor staff.

A diagrammatic representation of the fitted model illustrating standardised parameters is represented by Figure 3.16.

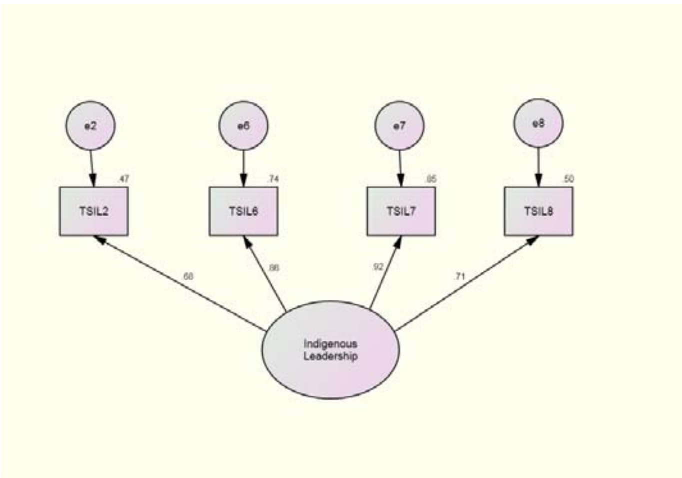


Figure 3.16 Indigenous Leadership Structural Equation Measurement Model

The model converged and was a good fit. The factor coefficients ranged from a low of .68 to a high of .92.

In summary - a one factor congeneric model of the latent construct Indigenous Leadership was specified as a latent variable with 4 reflective indicators. The data fit the model well $\chi^2(2)$ =3.374, p = .185, RMSEA = .064 (.000, .180), GFI = .990, TLI = .988 and CFI = .996.

The model was tested against the equivalent and Tau equivalent models and found to be the most parsimonious solution.

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the Indigenous Leadership factor were TSIL8 (.50), TSIL6 (.74), TSIL7 (.92) and TSIL2 (.47). All items are close to or above the "good" cut-off of .5 (Joreskog & Sorbom, 1989) . In summary the Promoting High Expectations Leadership factor is explaining between 47% and 92% of the variance across the individual indicator variables.

The construct reliability for Indigenous Leadership factor is .87; above the recommended cut off of 0.5 (Fornell & Larcker, 1981).

The variance extracted from the indicators by the Indigenous Leadership factor was .56. In other words the factor is accounting in total for 56% of the variation in the indicator variables which is above the recommended cut off of 50% (Fornell & Larcker, 1981).

The coefficient H value for the Indigenous Leadership model was .91 which represents a high reliability (Hancock & Mueller, 2001) .

The critical ratios for the indicator variables were he critical ratios for the indicator variables were TSIL2 (9.673), TSIL7 (14.732), TSIL6 (13.245) and TSIL8 (10.142) - all of which are significant at the .05 level which support a claim for convergent validity. All factor loadings are close to or above .7 further strengthening the claim for convergent validity.

In summary, the Indigenous Leadership construct would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the Indigenous Leadership construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.20).

Table 3.20 Indigenous Leadership Regression Weights

	TSIL2	TSIL7	TSIL6	TSIL8
Raw regression weights	.046	.185	.100	.045
Proportional regression weights	.122	.492	.266	.120

The scale score then becomes:

Indigenous Leadership index = (TSIL2*.122) +(TSIL7*.492) + (TSIL6*.266) + (TSIL8*.120)

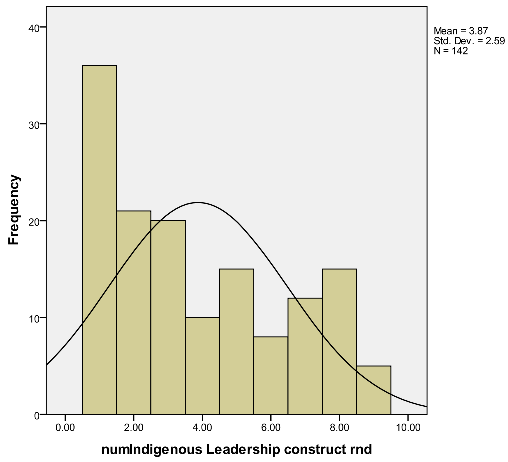


Figure 3.17 Indigenous Leadership Histogram

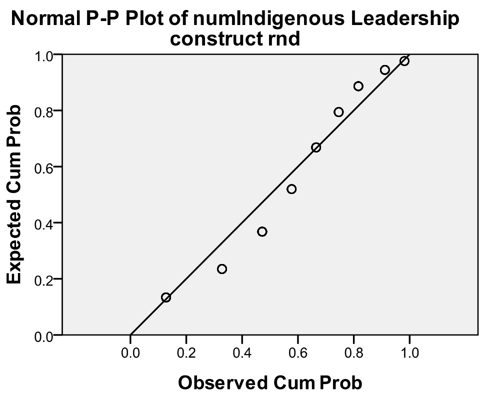


Figure 3.18 Indigenous Leadership P-P Plot

The histogram Figure 3.17 of the Indigenous Leadership index would indicate that at the meta-level the distribution of scores across the sample provide sufficient variance to allow it to be used in comparative studies within the sample. There is a positive skew, however, due to a large number of teachers in schools indicating their school rates low on this construct.

3.2.4.9 Indigenous Cultural Knowledge

The measurement models constructed to plumb the constructs of School Indigenous Ethos, High Expectations Leadership, Community Engagement and Indigenous Leadership were clearly reflective in nature and as such lent themselves to exploratory factor analysis (EFA) followed by confirmatory factor analysis (CFA) to establish the measurement models. The construct Indigenous Cultural Knowledge is more of a formative model (Edwards & Bagozzi, 2000). In a formative model the causal action flows from the items to the construct rather than from the construct to the items as in a reflective model. To help alleviate some of the issues associated with possible model misspecification the EFA was replaced with a Principal Components Analyse (PCA). Principal component analysis makes no assumption about an underlying causal model. Principal component analysis is a variable reduction procedure that attempts to define a relatively small number of components that account for most of the variance in a set of observed variables.

The congeneric CFA measurement model was replaced with Rasch modelling (Rasch, 1960). The Rasch approach has the added advantage of producing a scale score that is of interval level of measurement and non-sample specific. Further interval level of measurement on the item scale does not have to be assumed nor need the distribution be normal.

The following steps were employed in assessing the Indigenous Cultural Knowledge Rasch measurement scale:

- Evaluation of overall model fit – χ^2 Item-Trait Interaction statistic (Bonferroni adjusted alpha), reliability measures (Cronbach –alpha, Person Separation Index – PSI);
- An assessment of the suitability of the response format and check for disordered thresholds (Category Probability Curves, Threshold Map);
- Evaluation of fit of individual items – Fit Residual Value, χ^2 probability value;
- Evaluate person fit - Fit Residual Value, χ^2 probability value;
- Check for local dependency amongst items – Residual Correlations;
- Assess the dimensionality of the scale – Residual Principal Components; and
- Evaluate the targeting of the scale for the sample – Item Map, Person Item Distribution.
-

The test for differential item functioning was not conducted as no person factors were entered in the model.

Item Set

After re-specification the items listed in Table 3.21 were employed in the model.

Table 3.21

Item	Description
TSICK2b	I have read research on supporting Indigenous student learning (e.g., journal articles, conference papers, policy reports).
TSICK2c	I have participated in professional development activities focused on supporting Indigenous student learning.
TSICK2d	I am familiar with the Indigenous histories of the community where I teach.
TSICK2e	I am familiar with the Indigenous geographies and place names of the community where I teach.

A Rasch model was fitted incorporating the four items TSICK2b, TSICK2c, TSICK2d, and TSICK2e. The data and items fitted the model well (χ^2 (8) = 13.84, p = 0.086) with adequate measures of internal consistency; Person Separation Index (0.79) and Cronbach alpha (0.83). The scale was uni-dimensional and displayed good targeting as well as good individual item and person fit. No response dependency was detected.

Given the model was a good fit location scores were generated for each person. These scores are of interval level of measurement and are therefore suitable for subsequent parametric analysis. For a full description of the specification of the model refer to Appendix 3.1.5.

3.2.5 Leader Survey Constructs

3.2.5.1 Indigenous School Ethos Construct

Item Set and Model

The item set used to map the construct “School Ethos” is listed in Table 3.22.

Table 3.22 Indigenous School Ethos Item Set

Item	Description
LSSC2	Teachers adopt pedagogies that are sensitive to Indigenous students ways of knowing.
LSSC3	Teachers promote communication between Indigenous and non-Indigenous students.
LSSC4	Indigenous signs and symbols (e.g., art work, student murals etc.) are displayed in the classrooms and/or school.
LSSC5	The school as a community actively participates in Indigenous events.
LSSC7	Indigenous students feel as though they belong in the school.

A diagramatic representation of the fitted model illustrating standardised regression parameters is represented by Figure 3.19.

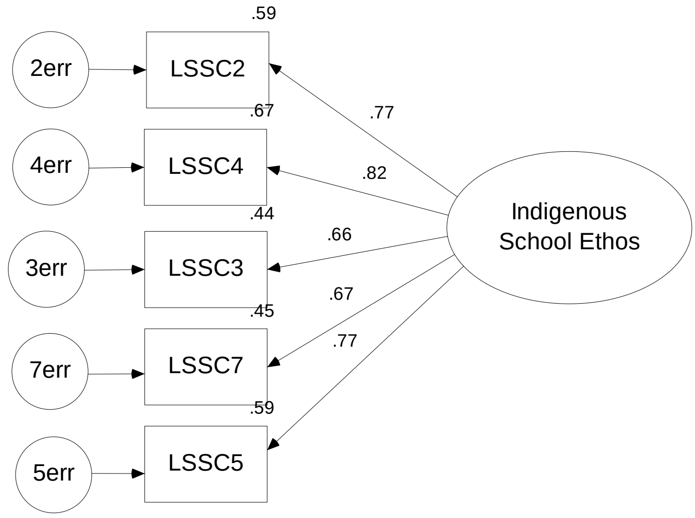


Figure 3.19 **Indigenous School Ethos Structural Equation Measurement Model**

In summary – a one factor model of the latent construct School Ethos was specified as a congeneric model latent variables with 5 reflective indicators. The data fit the model well χ^2 (5) = 10.831, p = .055, RMSEA = .101 (.000, .184), GFI = .967, TLI = .951 and CFI = 1.000.

The model was tested against the equivalent and Tau equivalent models and found to be the most parsimonious solution.

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the School Ethos model were LSSC2 (.593), LSSC3 (.439), LSSC4 (.672), LSSC5 (.591) and LSSC7 (.449). LSSC2, LSSC4 and LSSC5 is above the "good" cut-off while LSSC3 and LSSC7 are above the acceptable cut off (Fornell & Larcker, 1981). In summary the School Ethos model is explaining between 44% and 67% of the variance across the individual indicator variables.

The construct reliability for the School Ethos model is .86; well above the recommended cut off.

The variance extracted from the indicators by the School Ethos model was .55. In other words the factor is accounting for 55% of the variation in indicator variables which is below the recommended cut off of 50%.

The coefficient H value for the School Ethos model was .87 which represents a high reliability.

The critical ratios for the indicator variables were LSSC2 (9.232), LSSC3 (7.546), LSSC4 (10.083), LSSC5 (9.212) and LSSC7 (7.658), all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .77, .66, .82, .77 and .67. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

In summary, the School Ethos model would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the School Ethos model that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.23).

Table 3.23 School Ethos Item Set

	SC2	SC3	SC4	SC5	SC7
Raw Regression Weights	0.126	0.075	0.164	0.119	0.092
Proportional Regression Weights	0.219	0.130	0.285	0.207	0.160

The scale scores then becomes:

School Ethos = (LSSC2*.219) + (LSSC3*.130) + (LSSC4*.285) + (LSSC5*.207) + (LSSC7*.160)

3.2.5.2 Indigenous Leadership Construct

Item Set and Model

The item set used to map the construct "Indigenous Leadership" is listed in Table 3.24. This construct was operationalised as a multi-dimensional model.

Table 3.24 Indigenous Leadership Teachering Item Set

Item	Description
LSIL1	Indigenous and non-Indigenous staff plan curriculum together.
LSIL2	Indigenous community members are involved in curriculum planning.
LSIL3	Indigenous community members are professional development leaders for school staff.

Table 3.25 Indigenous leadership Roles Item Set

Item	Description
LSIL4	Indigenous staff hold formally recognised leadership positions in the school (e.g., deputy principal, head of department, head of curriculum, etc).
LSIL5	Indigenous staff hold informal leadership positions in the school (e.g., sports coordinator, before/ after school coordinator, responsible for Indigenous student initiatives, etc).
LSIL8	Indigenous community members involved with the school mentor staff.

A diagramatic representation of the fitted model illustrating standardised regression parameters is represented by Figure 3.20.

The model converged and was a good fit. The factor coefficients ranged from a low of 0.61 to a high of 0.88.

In summary – a two factor model of the latent construct Indigenous Leadership was specified as two correlated latent variables each with 3 reflective indicators. The data fit the model well Bollenstein p=.568, RMSEA = .013 (.000, .113), GFI = .976, TLI = .999 and CFI = .999.

The model was tested against the equivalent and Tau equivalent models and found to be the most parsimonious solution.

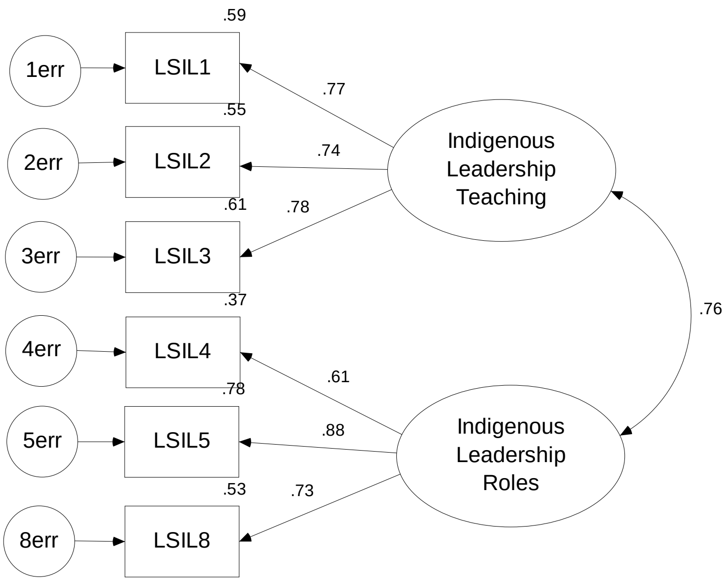


Figure 3.20 **Indigenous Leadership Structural Equation Measeurement Model**

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the Indigenous Leadership model were The SMCs for the indicator variables mapped by the Indigenous Leadership factor were LSIL1 (.593), LSIL2 (.547), LSIL3 (.612), LSIL4 (.374), LSIL5 (.777), and LSIL8 (.529) - all are above or close to the "good" cut-off. In summary the Indigenous Leadership model is explaining between 37% and 78% of the variance across the individual indicator variables.

The two factors were examined separately for reliability and validity, and only direct effects were considered. The construct reliability for the Indigenous Leadership model is .81 for the teaching factor and .79 for the roles factor, both of which were well above the recommended cut off.

The variance extracted from the indicators by the Indigenous Leadership model was .58 for the teaching factor, and .56 for the roles factor. In other words, the factors are accounting for 58% and 56% of the variation in their respective indicator variables, which is above the recommended cut off of 50%.

The coefficient H value for the Indigenous Leadership model was .81 for teaching and .84 for roles, which represents a high reliability.

The Indigenous Leadership model fitted well as confirmed by the non significant χ^2 supporting the claim for construct validity.

The critical ratios for the indicator variables were LSIL1 (8.715), LSIL2 (8.291), LSIL3 (8.899), LSIL4 (6.583), LSIL5 (10.300), and LSIL8 (8.120), all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .77, .74, .78, .61, .88 and .73. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

In summary, the Indigenous Leadership model would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the Indigenous Leadership model that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.26 and 3.27).

Table 3.26 – Indigenous Leadership Teaching Regression Weights

	IL1	IL2	IL3	IL4	IL5	IL8
Raw Regression Weights	.236	.235	.271	.026	.108	.046
Proportional Regression Weights	.256	.255	.294	.028	.117	.050

Table 3.27 - Indigenous Leadership Roles Regression Weights

	IL1	IL2	IL3	IL4	IL5	IL8
Raw Regression Weights	.049	.049	.056	.084	.344	.148
Proportional Regression Weights	.067	.076	.084	.124	.335	.202

The scale scores then become:

Indigenous Leadership Teaching = (LSIL1*.256) + (LSIL2*.255) + (LSIL3*.294) + (LSIL4*.028) + (LSIL5*.117) + (LSIL8*.050)

Indigenous Leadership Roles= (LSIL1*.067) + (LSIL2*.076) + (LSIL3*.084) + (LSIL4*.124) + (LSIL5*.335) + (LSIL8*.202)

3.2.5.3 High Expectations Construct

Item Set and Model

The item set used to map the construct "High Expectations" is listed in Table 3.28. This construct was operationalised as a multi-dimensional model.

Table 3.28 HIgh Expectations Leadership and Promotion Item Set

Item	Description
LSHE2	High expectations for Indigenous student learning are promoted in school policies.
LSHE3	High expectations for Indigenous student learning are promoted in staff meetings.
LSHE4	Staff are mentored in the importance of high expectations for Indigenous students.

Table 3.29 High Expectationa Enactment Item Set

Item	Description
LSHE1	Indigenous students are challenged on achieving their potential.
LSHE5	The staff of this school take collective responsibility for unlocking the potential in Indigenous students.
LSHE6	High expectations for Indigenous student learning are embedded in classroom context.
LSHE7	Parents of Indigenous students are consulted about high expectations for their children

A diagramatic representation of the fitted model illustrating standardised regression parameters is represented by Figure 3.21.

The model converged and was a good fit. The factor coefficients ranged from a low of 0.84 to a high of 0.94.

In summary – a two factor model of the latent construct High Expectations was specified as two correlated latent variables with 3 and 4 reflective indicators respectively. The data fit the model well Bollen-Stine bootstrap p = 0.223, RMSEA = .075 (.000, .132), GFI = .949, TLI = .984 and CFI = .990.

The model was tested against the equivalent and Tau equivalent models and found to be the most parsimonious solution.

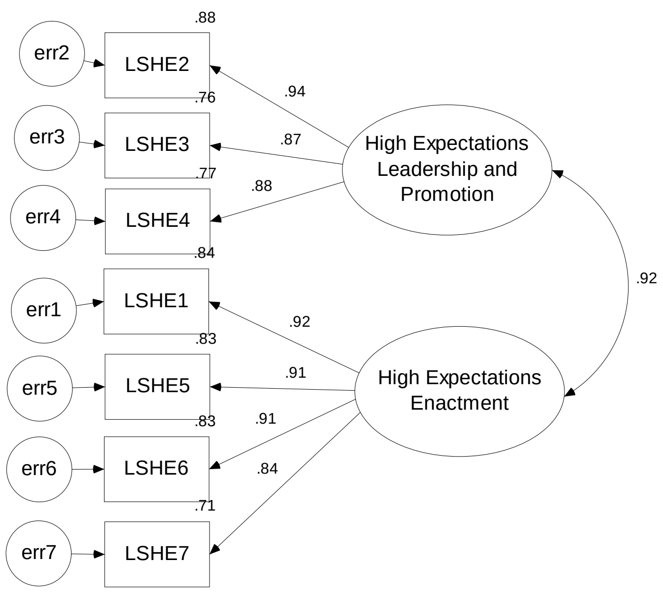


Figure 3.21 **High Expectations Leadwerahip Structural Equation Measurement Model**

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the High Expectations model were LSHE1 (.842), LSHE2 (.884), LSHE3 (.755), LSHE4 (.766), LSHE5 (.825), LSHE6 (.831), and LSHE7 (.709). All items were above the "good" cut-off (Fornell & Larcker, 1981). In summary the High Expectations model is explaining between 71% and 88% of the variance across the individual indicator variables.

The two factors were examined separately for reliability and validity, and only direct effects were considered. The construct reliability for the High Expectations model is .93 for the promotion factor and .94 for the enactment factor; well above the recommended cut off.

The variance extracted from the indicators by the High Expectations model was .81 for the promotion factor and .80 for the enactment factor. In other words the factors are accounting for 80-81% of the variation in their respective indicator variables which is well above the recommended cut off of 50%.

The coefficient H value for the High Expectations model was .93 for the promotion factor and .95 for the enactment factor, which represents a high reliability.

The High Expectations model fitted well as confirmed by the non significant χ^2 supporting the claim for construct validity.

The critical ratios for the indicator variables were LSHE1 (12.407), LSHE2 (12.875), LSHE3 (11.271), LSHE4 (11.404), LSHE5 (12.186), LSHE6 (12.264), and LSHE7 (10.747), all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .84, .87, .88, .91, .91, .92 and .94. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

In summary, the High Expectations model would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the High Expectations model that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.30 and 3.31).

Table 3.30 **High Expectations Leadership and Promotion Regression Weights**

	HE1	HE2	HE3	HE4	HE5	HE6	HE7
Raw Regression Weights	0.008	0.406	0.196	0.173	0.063	0.069	0.033
Proportional Regression Weights	0.078	0.398	0.192	0.170	0.062	0.068	0.032

Table 3.31 **High Expectations Enactment Regression Weights**

	HE1	HE2	HE3	HE4	HE5	HE6	HE7
Raw Regression Weights	0.241	0.088	0.043	0.038	0.192	0.209	0.101
Proportional Regression Weights	0.264	0.096	0.047	0.042	0.211	0.229	0.111

The scale scores then become:

High Expectations Leadership and Promotion = (LSHE1*.078) + (LSHE2*.398) + (LSHE3*.192) + (LSHE4*.170) + (LSHE5*.062) + (LSHE6*.068) + (LSHE7*.032)

High Expectations Enactment = (LSHE1*.264) + (LSHE2*.096) + (LSHE3*.047) + (LSHE4*.042) + (LSHE5*.211) + (LSHE6*.229) + (LSHE7*.111)

3.2.5.4 Innovative School Staffing Construct

Item Set and Model

The item set used to map the construct "Innovative School Staffing" is listed in Tables 3.32 and 3.33. This construct was operationalised as a multi-dimensional model. Note that the Tau equivalent model is represented here as it is the most parsimonious representation. (refer to Appendix 3.2.2).

Table 3.32 **Innovative School Staffing (Recruitment) Item Set**

Item	Description
LSSS2	Indigenous teachers are actively sought after by the school.
LSSS4	The school recruits Indigenous staff in professional support roles (e.g., teacher aide/ community education counsellor).
LSSS5	The school recruits Indigenous staff in support roles (e.g., cleaner, groundskeeper, gardener, or bus driver).
LSSS6	The school recruits administrative personnel in management positions with Indigenous experience or expertise (e.g., Heads of Department, Heads of Curriculum and Deputies).
LSSS8	The school seeks advice from the Indigenous Community on staffing.

Table 3.33 **Innovative School Staffing (Capacity and Capacity Building) Item Set**

Item	Description
LSSS7	The specialist teachers have experience or expertise with Indigenous students (e.g., speech pathologists, ESL, or special education).
LSSS9	The school has an induction process for teachers on Indigenous issues that incorporates community involvement.
LSSS10	There is sufficient budgetary capacity to support flexible approaches to staffing.

A diagramatic representation of the fitted model illustrating standardised regression parameters is represented by Figure 3.22.

The model converged and was a good fit. The factor coefficients ranged from a low of 0.64 to a high of 0.74.

In summary – a two factor model of the latent construct Innovative School Staffing was specified as two correlated latent variables with 3 and 5 reflective indicators respectively. The data fit the model well χ^2 (26) = 29.822, p = .275, RMSEA = .038 (.000, .091), GFI = .929, TLI = .985 and CFI = .986.

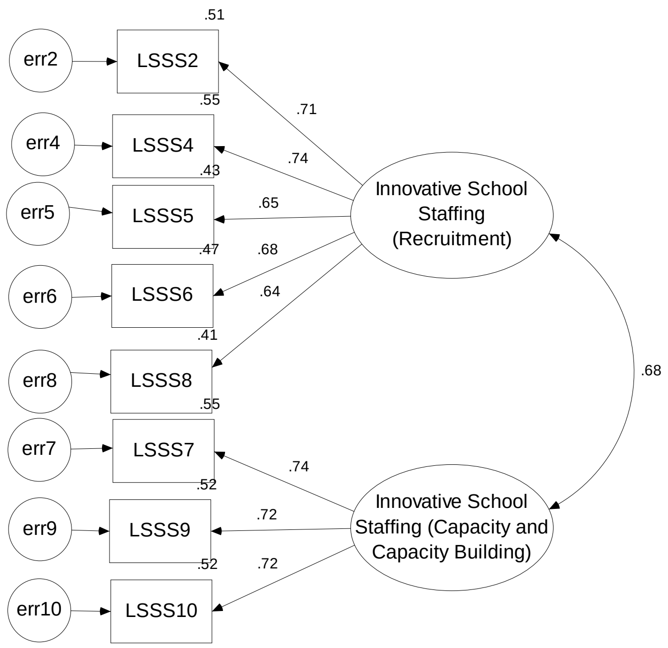


Figure 3.22 Innovative School Staffing Structural Equation Measurement Model

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the Innovative School Staffing model were LSSS5 (.427), LSSS8 (.413), LSSS6 (.469), LSSS4 (.549), LSSS2 (.506), LSSS7 (.547), LSSS10 (.522) and LSSS9 (.519). LSSS4, LSSS2, LSSS7, LSSS9 and LSSS10 are above the "good" cut-off while LSSS5, LSSS8, and LSSS6 are above the acceptable cut off (Fornell & Larcker, 1981). In summary the Innovative School Staffing model is explaining between 41% and 55% of the variance across the individual indicator variables.

The two factors were examined separately for reliability and validity, and only direct effects were considered. The construct reliability for the Innovative School Staffing model is .82 for the recruitment construct, and .77 for the capacity and capacity building construct; well above the recommended cut off.

The variance extracted from the indicators by the Innovative School Staffing model was .47 for the recruitment construct, and .53 for the capacity and capacity building construct. In other words the factors are accounting for 47% and 53% of the variation in their respective indicator variables which is close to the recommended cut off of 50%.

The Innovative School Staffing model fitted well as confirmed by the non significant χ^2 supporting the claim for construct validity.

The critical ratio for all the indicator variables was 13.985 due to fitting a Tau equivalent model. This value is significant at the .05 level which supports a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .72, .72, .74, .71, .74, .65, .68 and .64. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

In summary, the Innovative School Staffing model would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the Innovative School Staffing model that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.34 and 3.35).

Table 3.34 Innovative School Staffing (Recruitment) Regression Weights

	SS2	SS4	SS5	SS6	SS7	SS8	SS9	SS10
Raw Regression Weights	0.086	0.102	0.063	0.074	0.024	0.059	0.022	0.022
Proportional Regression Weights	0.190	0.226	0.139	0.164	0.053	0.131	0.049	0.049

Table 3.35 Innovative School Staffing Regression Weights

Innovative School Staffing	SS2	SS4	SS5	SS6	SS7	SS8	SS9	SS10
Raw Regression Weights	0.021	0.025	0.015	0.018	0.124	0.014	0.111	0.113
Proportional Regression Weights	0.048	0.057	0.034	0.041	0.281	0.032	0.252	0.256

The scale scores then become:

Innovative School Staffing (Recruitment) = (LSSS2*.190) + (LSSS4*.226) + (LSSS5*.139) + (LSSS6*.164) + (LSSS7*.053) + (LSSS8*.131) + (LSSS9*.049) + (LSSS10*.049)

Innovative School Staffing = (LSSS2*.048) + (LSSS4*.057) + (LSSS5*.034) + (LSSS6*.041) + (LSSS7*.281) + (LSSS8*.032) + (LSSS9*.252) + (LSSS10*.256)

3.2.5.5 Innovative School Modelling

Item Set and Model

The item set used to map the construct "Innovative School Modelling" is listed in Table 3.36.

Table 3.36 Innovative School Modelling Item Set

Item	Description
LSSM2	Flexible timetabling allows the school to accommodate community and student needs (e.g., Indigenous community events, student mobility, family circumstances).
LSSM3	The school has a dedicated space or centre for Indigenous students and/ or community members.
LSSM4	The school has policies and procedures in place to monitor and respond to student mobility between schools.

A diagramatic representation of the fitted model illustrating standardised regression parameters is represented by Figure 3.23.

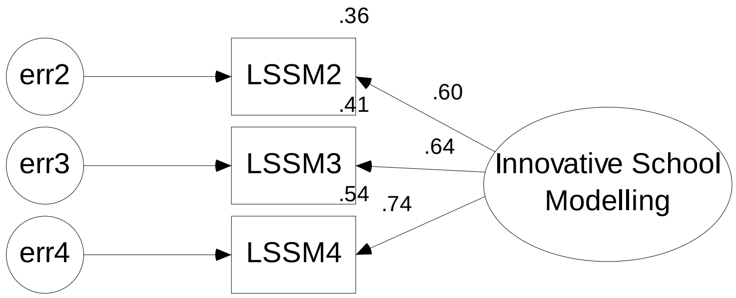


Figure 3.23 Innovative School Modelling Structural Equation Measurement Model

It was not possible to obtain goodness of fit statistics as there were only three reflective indicators. The factor coefficients ranged from a low of 0.60 to a high of 0.74.

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the Innovative School Modelling model were LSSM2 (.363), LSSM3 (.408), and LSSM4 (.544). LSSM4 is above the "good" cut-off while LSSM2 and LSSM3 are above the acceptable cut off (Fornell & Larcker, 1981). In summary the Innovative School Modelling model is explaining between 36% and 54% of the variance across the individual indicator variables.

The construct reliability for the Innovative School Modelling model is .70; well above the recommended cut off.

The variance extracted from the indicators by the Innovative School Modelling model was .44. In other words the factor is accounting for 44% of the variation in indicator variables which is below the recommended cut off of 50%.

The coefficient H value for the Innovative School Modelling model was .71 which represents a high reliability.

The critical ratios for the indicator variables were LSSM2 (12.827), LSSM3 (13.417) and LSSM4 (14.881), all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .74, .64 and .60. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

In summary, the Innovative School Modelling model would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the Innovative School Modelling model that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.37).

Table 3.37– Innovative School Modelling

	SM2	SM3	SM4
Raw Regression Weights	0.165	0.148	0.271
Proportional Regression Weights	0.283	0.253	0.464

The scale scores then becomes:

Innovative School Modelling = (LSSM2*.283) + (LSSM3*.253) + (LSSM4*.464)

3.2.5.6 Community Engagement Construct

Item Set and Model

The item set used to map the construct "Community Engagement" is listed in Table 3.38. This construct was operationalised as a multi-dimensional model.

Table 3.38 School Community Engagemnet Item Set

Item	Description
LSCE1	Parents and/ or community members participate in classroom teaching or student learning.
LSCE2	There is a program to encourage parents and/ or community members to become actively involved in the school.
LSCE4	An outreach program is maintained to parents/ families who do not visit the school.

Table 3.39 School Governance and Community Engagement Item Set

Item	Description
LSCE6	Indigenous community members are consulted on major decisions about the direction of the school.
LSCE7	Indigenous community priorities are taken into account as part of the school planning process.
LSCE8	Indigenous community members have a voice in the everyday running of the school.

LSCE9	School staff have significant roles in meetings and events that involve the Indigenous community.

A diagramatic representation of the fitted model illustrating standardised regression parameters is represented by Figure 3.24.

The model converged and was a good fit. The factor coefficients ranged from a low of 0.65 to a high of 0.91.

In summary – a two factor model of the latent construct Community Engagement was specified as two correlated latent variables with 3 and 4 reflective indicators respectively. The data fit the model well Bollen-Stine bootstrap p = 0.368, RMSEA = .068 (.000, .134), GFI = .947, TLI = .973 and CFI = .983.

The model was tested against the equivalent and Tau equivalent models and found to be the most parsimonious solution.

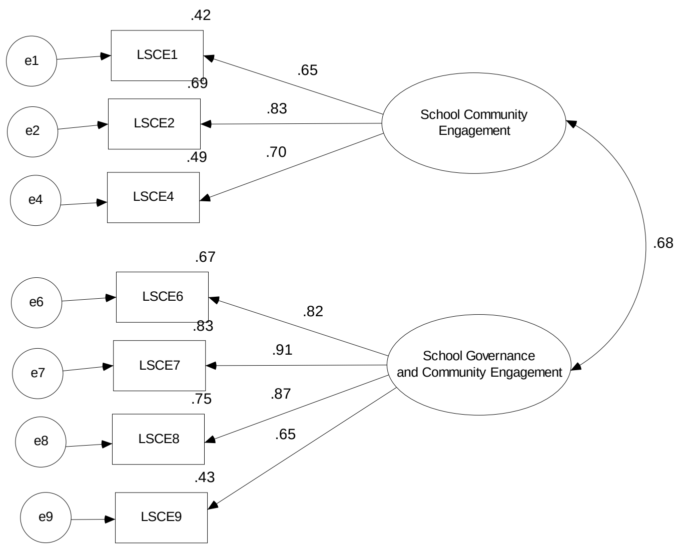


Figure 3.24 Community Engagement Structural Equation Measurement Model

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the Community Engagement model were LSCE1 (.423), LSCE2 (.695), LSCE4 (.494), LSCE6 (.667), LSCE7 (.832), LSCE8 (.752) and LSCE9 (.428). LSCE2, LSCE6, LSCE7, and LSCE8 are above the "good" cut-off while LSCE1, LSCE4, and LSCE9 are above the acceptable cut off (Fornell & Larcker, 1981). In summary the Community Engagement model is explaining between 42% and 83% of the variance across the individual indicator variables.

The two factors were examined separately for reliability and validity, and only direct effects were considered. The construct reliability for the Community Engagement model is .77 for School Community Engagement and .89 for School Governance and Community Engagement; well above the recommended cut off.

The variance extracted from the indicators by the Community Engagement model was .53 for School Community Engagement and .67 for School Governance and Community

Engagement. In other words, the factors are accounting for 53% and 67% of the variation in their respective indicator variables which is above the recommended cut off of 50%.

The coefficient H value for the Community Engagement model was .80 for School Community Engagement and .92 for School Governance and Community Engagement which represents a high reliability.

The Community Engagement model fitted well as confirmed by the non significant χ^2 supporting the claim for construct validity.

The critical ratios for the indicator variables were LSCE1 (6.219), LSCE2 (8.408), LSCE4 (6.836), LSCE6 (9.095), LSCE7 (10.808), LSCE8 (9.971) and LSCE9 (6.680), all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .65, .83, .70, .82, .92, .87 and .65. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

In summary, the Community Engagement model would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the Community Engagement model that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.40 and 3.41).

Table 3.40 School Community Engagement Regression Weights

	CE1	CE2	CE4	CE6	CE7	CE8	CE9
Raw Regression Weights	0.128	0.277	0.133	0.024	0.052	0.037	0.011
Proportional Regression Weights	0.193	0.418	0.201	0.036	0.079	0.056	0.017

Table 3.41 School Governance and Community Engagement Regression Weights

	CE1	CE2	CE4	CE6	CE7	CE8	CE9
Raw Regression Weights	0.020	0.042	0.020	0.162	0.360	0.251	0.073
Proportional Regression Weights	0.022	0.045	0.021	0.175	0.388	0.270	0.079

The scale scores then become:

School Community Engagement = (LSCE1*.194) + (LSCE2*.419) + (LSCE4*.200) + (LSCE6*.035) + (LSCE7*.079) + (LSCE8*.056) + (LSCE9*.017)

School Governance and Community Engagement = (LSCE1*.020) + (LSCE2*.045) + (LSCE4*.022) + (LSCE6*.175) + (LSCE7*.388) + (LSCE8*.271) + (LSCE9*.078)

3.2.5.7 Sustainability Construct

Item Set and Model

The item set used to map the construct "Sustainability" is listed in Tables 3.42 and 3.43. This construct was operationalised as a multi-dimensional model. Note that the Tau equivalent model has been fitted as it is the most parsimonious.

Table 3.42 Sustainability Teacher Capacity Item Set

Item	Description
LSSU6	Teachers' lack of awareness of Indigenous education to maintain and improve current initiatives is an issue in this school.
LSSU7	There is a shortage of teachers committed to Indigenous education to maintain and improve current initiatives in this school.
LSSU8	Teachers at this school have a limited capacity to maintain and improve current Indigenous education initiatives in this school.
LSSU9	Staff in this school experience competing demands on their time that impact on the sustainability of Indigenous education initiatives.

Table 3.43 Sustainability Systemic Imperatives Item Set

Item	Description
LSSU3	The shortage of Indigenous staff is a challenge to continued participation in leadership roles.
LSSU4	Staff turnover is a challenge to sustainability of Indigenous education priorities in this school.
LSSU5	Timely access to professional development for school staff in relation to Indigenous education is a challenge to the sustainability of our programs.
LSSU10	The school's difficulty in ensuring the ongoing engagement of members of the Indigenous community is a challenge to program sustainability.

A diagramatic representation of the fitted model illustrating standardised regression parameters is represented by Figure 3.25.

The model converged and was a good fit. The factor coefficients ranged from a low of 0.59 to a high of 0.83.

In summary – a two factor model of the latent construct Sustainability was specified as two correlated latent variables with 3 and 4 reflective indicators respectively. The data fit the model well χ^2 (26)=27.588, p=.379, RMSEA = .026 (.000, .090), GFI = .931, TLI = .992 and CFI = .992.

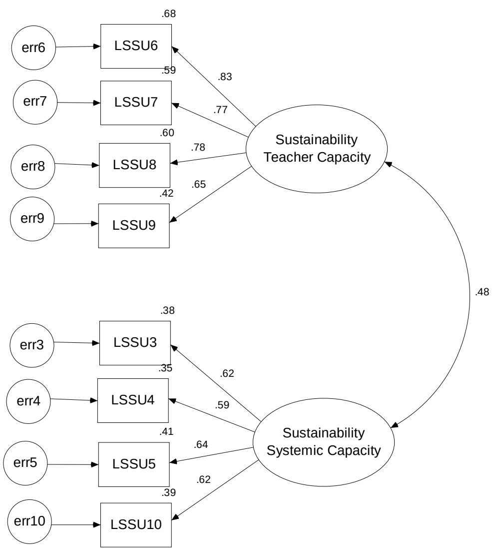


Figure 3.25 **Sustainability Structural Equation Measeurement Model**

Validity and Reliability Measures

The SMCs for the indicator variables mapped by the Sustainability model were LSSU9 (.418), LSSU10 (.386), LSSU6 (.682), LSSU7 (.593), LSSU3 (.383), LSSU4 (.353), LSSU5 (.408) and LSSU8 (.602). LSSU6, LSSU7, and LSSU8 are above the “good” cut-off while LSSU9, LSSU10, LSSU3, LSSU4 and LSSU5 are above the acceptable cut off (Fornell & Larcker, 1981). In summary the Sustainability model is explaining between 38% and 68% of the variance across the individual indicator variables.

The two factors were examined separately for reliability and validity, and only direct effects were considered. The construct reliability for the Sustainability model is .85 for the Teacher Capacity factor and .71 for the Systemic Capacity factor, above the recommended cut off.

The variance extracted from the indicators by the Sustainability model was .58 for the Teacher Capacity factor and .38 for the Systemic Capacity factor. In other words, the factors are accounting for 58% and 38% of the variation in their respective indicator variables which is above the recommended cut off of 50% for the Teacher Capacity factor only.

The coefficient H value for the Sustainability model was .86 for the Teacher Capacity factor and .71 for the Systemic Capacity factor which represents a high reliability.

The Sustainability model fitted well as confirmed by the non significant χ^2 supporting the claim for construct validity.

The critical ratios for the indicator variables were all 13.761 due to the Tau equivalent model being used. The CR was significant at the .05 level which support a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .77, .83, .78, .64, .62, .65, .59 and .62. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

In summary, the Sustainability model would appear to reliably explain a reasonable proportion of the variance displayed by the indicator variables when controlling for measurement error. There is also a good case for claiming construct and convergent validity.

Index Generation

A scale score for the Sustainability model that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (see Table 3.44 and 3.45).

Table 3.44 Teacher Capacity Rregression Weights

Teacher Capacity	SU3	SU4	SU5	SU6	SU7	SU8	SU9	SU10
Raw Regression Weights	0.008	0.007	0.009	0.175	0.119	0.123	.059	0.008
Proportional Regression Weights	0.016	0.014	0.018	0.344	0.234	0.242	0.116	0.016

Table 3.45 Systemic Capacity Regression Weights

Systemic Capacity	SU3	SU4	SU5	SU6	SU7	SU8	SU9	SU10
Raw Regression Weights	0.095	0.084	0.106	0.029	0.019	0.020	0.010	0.096
Proportional Regression Weights	0.207	0.183	0.231	0.063	0.041	0.044	0.022	0.209

The scale scores then become:

Teacher Capacity index = (LSSU3*.016) + (LSSU4*.014) + (LSSU5*.018) + (LSSU6*.344) + (LSSU7*.234) + (LSSU8*.242) + (LSSU9*.116) + (LSSU10*.016)

Systemic Capacity index = (LSSU3*.207) + (LSSU4*.183) + (LSSU5*.231) + (LSSU6*.063) + (LSSU7*.041) + (LSSU8*.044) + (LSSU9*.022) + (LSSU10*.209)

3.3 Teacher Survey Comparative Analysis

3.3.1 Introduction

The foundational premise that involvement in the SSLC program will act as a causal agent in operationalising Stronger Smarter messages was tested via a three-stage process.

The first stage involved identifying the latent constructs that mapped to the Stronger Smarter tenets. This was done through review of the research literature, analysis of Stronger Smarter documentation and literature, and extensive consultation with stakeholders such as SSI members, IRG, IERG, teachers and school leaders with prior experience in Indigenous education.

The second stage involved an extensive analysis of the items proposed to plumb the constructs identified. Measurement models were then constructed and validated along with indexes to quantify the construct (see Appendices 3.2 and 3.4).

The third stage involves a comparative study where SSLC membership of a school is treated as an intervention and comparisons made with non- SSLC like schools. The comparisons are across the constructs identified and plumb teachers' view of their school. The null hypothesis could be stated as *"there is no difference in the way teachers who are sited in an SSLC school and teachers who are not sited in an SSLC school view the level of the construct of interest* *within their school"*. It is important to note that the comparison is not at the school level but at the SSLC membership level.

3.3.2 The Process

Error bar graphs and box plots were initially constructed as a visual aid to qualifying possible differences across groups and to check on underlying distributions. Independent sample T-tests were used to test for statistically significant differences ($p<0.05$) within constructs across teachers who were members of an SSLC school (hub or affiliate) and those teachers who were not members of an SSLC school. Effect sizes were calculated for all comparisons irrespective of whether statistical significance was reached or not. Effect sizes were calculated using a pooled variance approach to take into account unequal group sizes. A factorial Analysis of Covariance (ANCOVA) model (see Appendix 3.4) was used to investigate possible confounding variables for influence on the level of the construct as well as any possible interaction effects. Variables considered to possibly confound and/or interact included percentage of Indigenous students in the school, type of school (primary or secondary) and location (provincial and metropolitan). There was a -0.94 correlation between Socio-economic indicator for the school (ISCEA) and percentage of Indigenous students enrolled. This high level of redundancy had the potential to cause multi-collinearity and model misspecification. As a consequence ISCEA was dropped from the models as it was considered percentage of Indigenous students an appropriate indicator given the research questions.

3.3.3 Results

The results of the comparisons are given in Table 3.46.

Table 3.46 SSLC vs non-SSLC Comparison of Constructs

Construct	Mean (SD) SSLC	Mean (SD) non-SSLC	t-value	p	Effect size
Indigenous School Ethos	6.09 (2.15)	4.80 (2.43)	-3.259	0.003*	0.58
School Governance and Community	4.31 (2.43)	3.78 (2.66)	-1.200	0.258	0.21
School Community Engagement	4.08 (1.99)	3.8 (2.14)	-2.56	0.013*	0.46
Promoting High Expectation Leadership	5.96 (2.03)	4.93 (2.76)	-2.22	0.031*	0.40
High Expectation Leadership Enactment	7.24 (1.58)	6.54 (2.34)	-2.20	0.028*	0.39
Indigenous Leadership	4.02 (2.64)	3.35 (2.36)	-1.20	0.209	0.21
Indigenous Cultural Knowledge##	-0.093 (.606)	-0.190 (.542)	-0.873	0.384	0.17

N = 139 SSLC teachers (39 schools), 41 non-SSLC teachers (17 schools)
* Significant at the 0.05 level
Rasch scored

3.3.3.1 Indigenous School Ethos

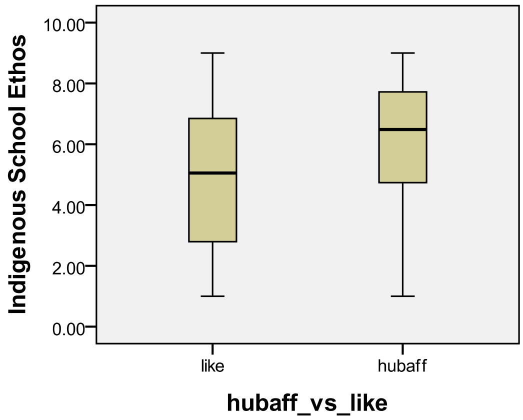


Figure 3.26 Indigenous School Ethos Box Plot

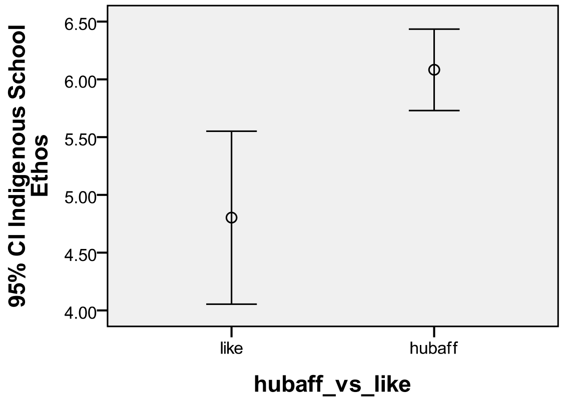


Figure 3.27 Indigenous School Ethos 95% Error Bar Chart

The box plot (Figure 3.26) and the 95% error bar chart (Figure 3.27) indicate a clear difference in level and distribution of the construct values between those teachers' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Approximately 75% of the SSLC schools are above the median value of the non-SSLC schools with a much tighter distribution around the mean.

On average teachers exposed to an SSLC environment reported higher levels of Indigenous School Ethos (M=6.09, SD=2.15) in their schools compared to those teachers not exposed to an SSLC environment (M=4.80, SD=2.43).

This difference was statistically significant t (178) =-3.259, p<0.05; this difference represented a medium effect size d=0.58.

Finding 5: SSLC teachers reported higher levels of Indigenous school ethos in their schools than non-SSLC teachers.

3.3.3.2 School Governance and Community

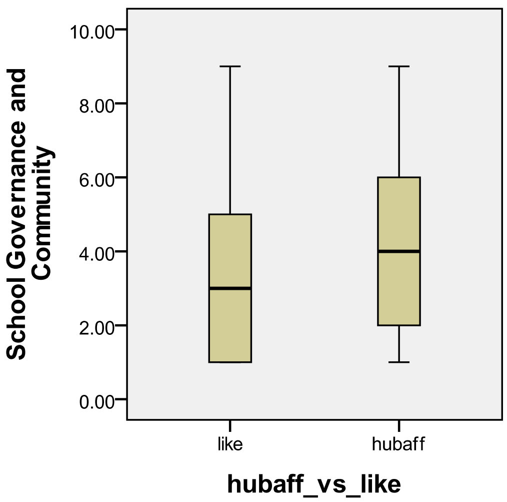


Figure 3.28 School Governance and Community Box Plot

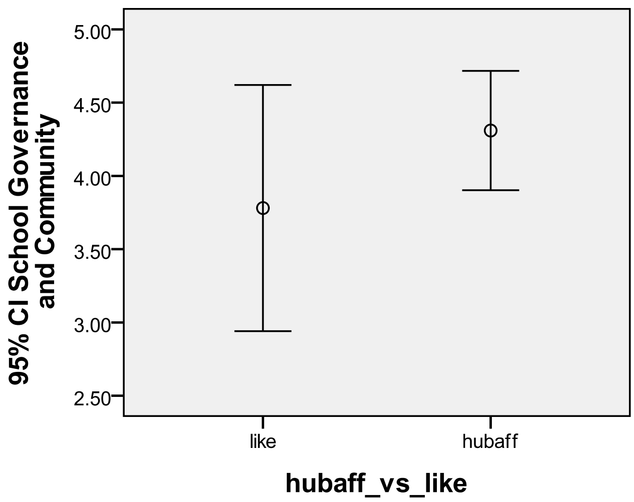


Figure 3.29 School Governance and Community 95% Error Bar Chart

The box plot (Figure 3.28) and the 95% error bar chart (Figure 3.29) would indicate a tendency for teachers' observations in a school with an SSLC influence to rate their school higher on the School Governance and Community construct compared to those teacher in a non SSLC environment. However this difference is confounded by the wide variation in levels of the construct in both SSLC and non-SSLC schools so it is unlikely the difference will reach statistical significance.

On average, teachers exposed to an SSLC environment reported higher levels of School Governance and Community (M=4.31, SD=2.43) in their schools compared to those teachers not exposed to an SSLC environment (M=3.78, SD=2.66). This difference was not statistically significant t (178) =-1.200, $p>0.05$; further this difference represented a small effect size d=0.21. That this difference did not reach significance is perhaps not surprising in that the construct attempted to plumb governance and decision making processes in the school. These processes are often driven by jurisdictional imperatives and procedural norms that do not lend themselves to local modification. However the level of this construct was found to be related to the percentage of Indigenous students enrolled in the school (refer ANCOVA results) irrespective of whether the school was an SSLC school or not. Specifically those schools with a higher percentage of Indigenous students were more likely to include the Indigenous Community in strategic decision making roles in the school.

Finding 6: The percentage of Indigenous students enrolled influences the level of Indigenous involvement in school and community.

3.3.3.3 School Community Engagement

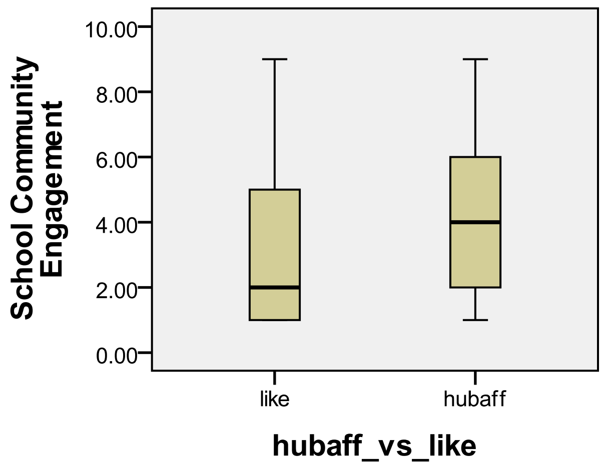


Figure 3.30 **School Community Engagement Box Plot**

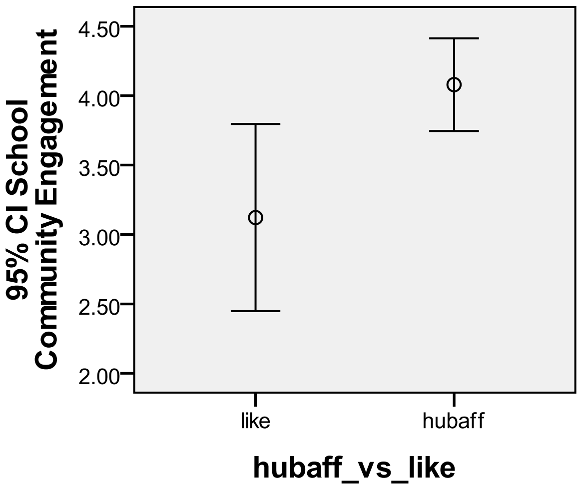


Figure 3.31 **School Community Engagement 95% Error Bar Chart**

The box plot (Figure 3.30) and 95% error bar chart (Figure 3.31) indicate a clear difference in level and distribution of the construct values between those teachers' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Approximately 75% of the SSLC schools are above the median value of the non-SSLC schools with a much tighter distribution around the mean.

On average teachers exposed to an SSLC environment reported higher levels of School Community Engagement (M=4.08, SD=1.99) in their schools compared to those teachers not exposed to an SSLC environment (M=3.8, SD=2.14). This difference was statistically significant t (178) =-2.560, p<0.05; further this difference is approaching a medium effect size d=0.46.

Finding 7: SSLC teachers reported higher levels of school community engagement than non-SSLC teachers.

3.3.3.4 Promoting High Expectation Leadership

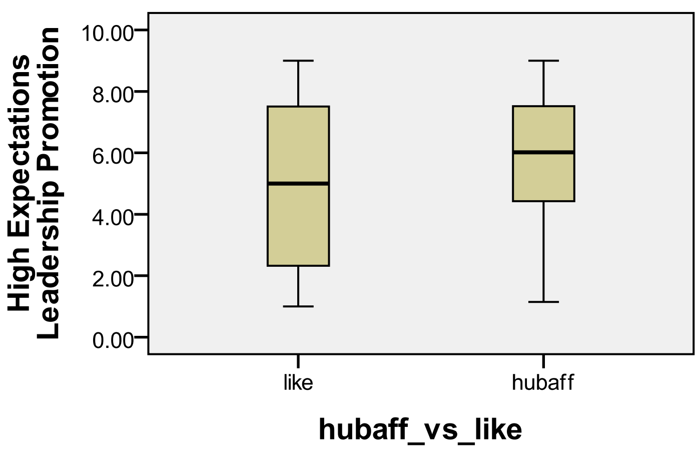


Figure 3.32 **Promoting High Expectation Leadership Box Plot**

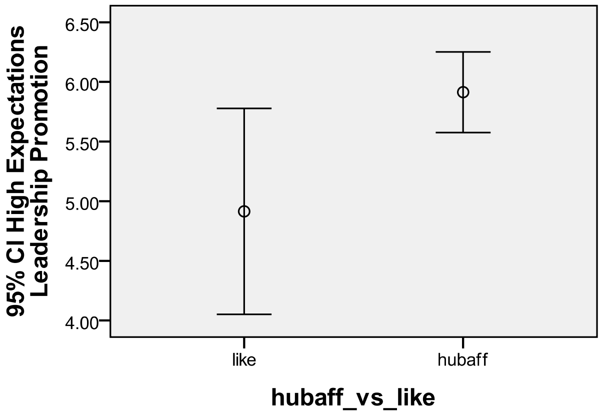


Figure 3.33 **Promoting High Expectation Leadership 95% Error Bar Chart**

The box plot (Figure 3.32) and the 95% error bar chart (Figure 3.33) indicate a clear difference in level and distribution of the construct values between those teachers' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Approximately 70% of the SSLC schools are above the median value of the non-SSLC schools with a much tighter distribution around the mean.

On average teachers exposed to an SSLC environment reported higher levels of Promoting High Expectations Leadership (M=5.96, SD=2.03) in their schools compared to those teachers not exposed to an SSLC environment (M=4.93, SD=2.76).

This difference was statistically significant t (178) =-2.220, p<0.05; further this difference is approaching a medium effect size d=0.40.

Finding 8: SSLC teachers reported higher levels of promoting high expectations leadership than non-SSLC teachers.

3.3.3.5 High Expectation Leadership Enactment

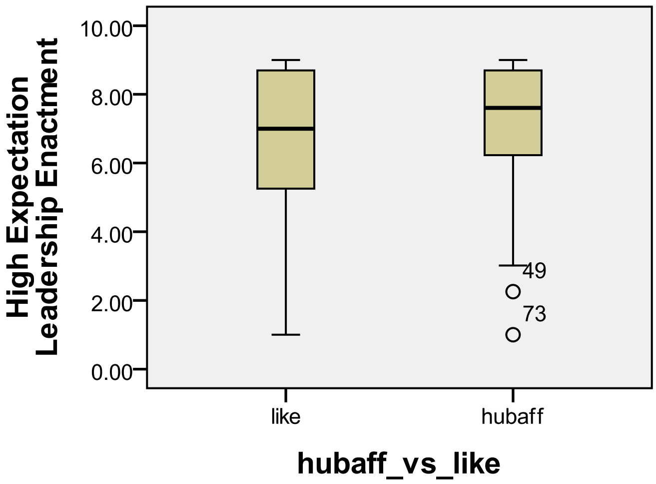


Figure 3.34 **High Expectation Leadership Enactment Box Plot**

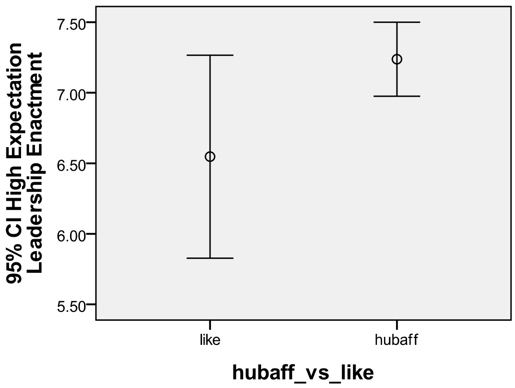


Figure 3.35 **High Expectation Leadership Enactment 95 % Error Bar Chart**

The box plot (Figure 3.34) and the 95% error bar chart (Figure 3.35) indicate a difference in level and distribution of the construct values between those teachers' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Specifically the SSLC schools demonstrate a tighter clustering around a higher mean value than non-SSLC schools.

On average teachers exposed to an SSLC environment reported higher levels of High Expectations Leadership Enactment (M=7.24, SD=1.58) in their schools compared to those teachers not exposed to an SSLC environment (M=6.54, SD=2.34).

This difference was statistically significant t (178) =-2.200, p<0.05; further this difference is approaching a medium effect size d=0.39.

Finding 9: SSLC teachers reported higher levels of high expectation leadership enactment than non-SSLC teachers

3.3.3.6 Indigenous Leadership

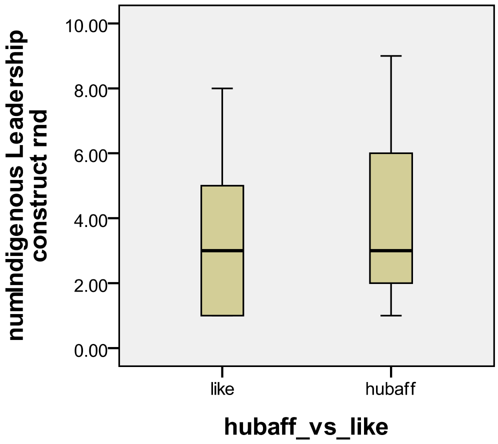


Figure 3.36 Indigenous Leadership Box Plot

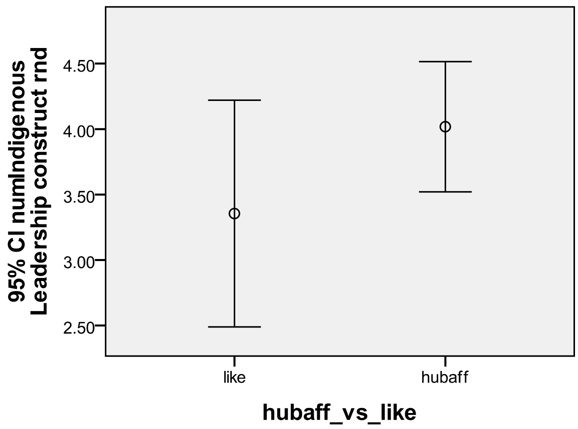


Figure 3.37 Indigenous Leadership 95% Error Bar Chart

Both the box plot (Figure 3.36) and 95% confidence limit plot (Figure 3.37) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have higher levels on the construct.

On average teachers exposed to an SSLC environment reported higher levels of Indigenous Leadership (M=4.02, SD 2.64) in their schools compared to those teachers not exposed to an SSLC environment (M=3.35, SD=2.36). This difference was not statistically significant t (178) =-1.200, p>0.05; further this difference represented a small effect size d=0.21. Percentage Indigenous students enrolled was approaching significance (p=0.062, partial η^2=.025) i.e. schools with a higher percentage of Indigenous students tending to score higher on this construct (refer ANCOVA results).

Finding 10: Those schools with a higher percentage of Indigenous students were more likely to report including the Indigenous community in leadership roles in the school.

3.3.3.7 Indigenous Cultural Knowledge

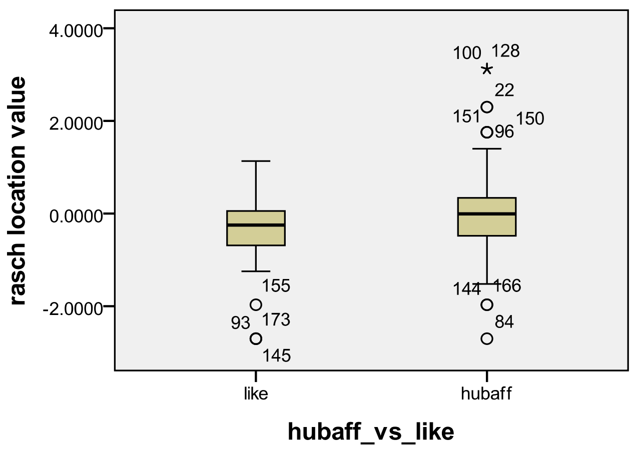


Figure 3.38 Indigenous Cultural Knowledge Box Plot

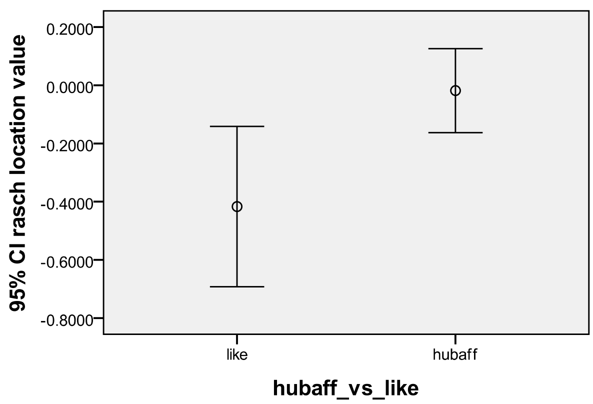


Figure 3.39 Indigenous Cultural Knowledge 95% Error Bar Chart

The error bar plot (Figure 3.39) indicates a difference in level and distribution of the construct values between those teachers' observations in a school with an SSLC influence and those schools that do not have an SSLC influence. However the box plot Figure 3.38 indicates some outliers are present. These outliers were removed from the analysis.

On average teachers exposed to an SSLC environment reported higher levels of Indigenous Cultural Knowledge (M=-0.093, SD 0.606) in their schools compared to those teachers not exposed to an SSLC environment (M=-0.190, SD=0.541). This difference was not statistically significant t (164) =-0.873, p>0.05; further this difference represented a small effect size d=0.17. A Mann-Whitney U test (non parametric test) was also conducted with the outliers included. This test also returned a non-significant result.

Finding 11: There were no significant differences between SSLC and non-SSLC teacher self-reported levels of Indigenous cultural knowledge.

3.3.3.8 Analysis of Covariance (ANCOVA)

To measure the possible effect of other determiners on the level of the construct and to adjust for possible confounding effects, a factorial ANCOVA (see Appendix 3.4) was also employed. The model consisted of the construct as the dependent variable with the categorical variables SSLC exposure (yes, no), location (metropolitan, provincial, remote/very remote), and school type (primary, secondary) being entered as fixed factors. The continuous variables percentage of Indigenous students enrolled was entered as a covariate. Interaction effects were also plumbed across the fixed factors.

The ANCOVA models reinforced the results of the independent sample T-tests with the following comments.

Indigenous School Ethos

As well as a main effect for the SSLC-non SSLC split there was a main effect for the primary-secondary teacher groups (p = 0.026, partial η^2 = 0.028). Primary school teachers' scored their schools on average higher than secondary school teachers but the differential gain across the SSLC-non-SSLC split was approximately the same.

Finding 12: Primary school teachers rated their schools higher on Indigenous school ethos than secondary school teachers - but SSLC appears to have a similar impact in primary and secondary schools.

School Governance and Community

While there was no main effect for the SSLC-non SSLC split, a significant difference was identified for % of Indigenous students enrolled (p=0.021, partial η^2 =.030) i.e. schools with a higher percentage of Indigenous students tending to score higher on this construct. This would be expected, as schools with a high percentage of Indigenous students would be more likely to involve the community in decision making processes about Indigenous students.

Finding 13: Schools with a higher percentage of Indigenous students were more likely to report that they involved members of the Indigenous community in school governance.

3.3.3.9 Promoting High Expectation Leadership

As well as a main effect for the SSLC-non SSLC split there was a main effect for the primary-secondary teacher groups (p = 0.003, partial η^2 = 0.049). Primary school teachers' scored their schools on average higher than secondary schools but the differential gain across the SSLC-non-SSLC split was approximately the same.

Finding 14: Primary school teachers rated their schools higher on promoting high expectations leadership than secondary school teachers - but SSLC appeared to have a similar impact in primary and secondary schools.

3.3.3.10 High Expectation Leadership Enactment

The T-test indicated a significant difference between SSLC and non-SSLC teacher rating of their school on this construct but once the effect of % Indigenous students, school type and location were controlled for the p value (0.079) increased to just above the 0.05 cut-off. None of the variables % Indigenous students, school type and location was significant. So it is still likely the SSLC non-SSLC split is contributing to difference.

Indigenous Leadership: While there was no main effect for the SSLC-non SSLC split % of Indigenous students enrolled was approaching significance (p=0.062, partial η^2 =.025). That is, schools with a higher percentage of Indigenous students tending to score higher on this construct.

3.4 Leader Survey Comparative Analysis

3.4.1 Introduction

The foundational premise that involvement in the SSLC/SSLP program will act as a causal agent in operationalising Stronger Smarter messages was tested via a three-stage process.

The first stage involved identifying the latent constructs that mapped to the SSLC tenets. This was done through review of the research literature supported by consultation with stakeholders such as SSI members, IRG, IERG, focus groups of Queensland teachers and principals with prior experience in Indigenous education.

The second stage involved an extensive analysis of the items proposed to plumb the constructs identified. Measurement models were then constructed and validated along with indexes to quantify the construct.

The third stage involves a comparative study where SSLC membership of a school is treated as an intervention and comparisons made with non- SSLC similar schools. The comparisons are across the constructs identified and plumb leaders' view of their school. The null hypothesis could be stated as *"there is no difference in the way leaders who are sited in an SSLC school and leaders who are not sited in an SSLC school view the level of the construct of interest within their school"*. It is important to note that the comparison is not at the school level but at the SSLC membership level.

3.4.2 The Process

Error bar graphs and box plots were initially constructed as a visual aid to qualifying possible differences across groups and to check on underlying distributions. Independent sample T-tests were used to test for statistically significant differences (p<0.05) within constructs across leaders who were members of an SSLC school (hub or affiliate) and those leaders who were not members of an SSLC school. Effect sizes were calculated for all comparisons irrespective of whether statistical significance was reached or not. Effect sizes were calculated using a pooled variance approach to take into account unequal group sizes. A factorial Analysis of Covariance (ANCOVA) model (see Appendix 3.5) was used to investigate possible confounding variables for influence on the level of the construct as well as any possible interaction effects. Variables considered to possibly confound and/or interact included percentage of Indigenous students in the school, type of school (primary or secondary) and location (remote/very remote, provincial and metropolitan).

3.4.3 Results

The results of the comparisons are given in Table 3.47.

Table 3.47 SSLC vs. non-SSLC Comparison of Constructs

Construct	Mean (SD) SSLC	Mean (SD) non-SSLC	*t*-value	*p*	Effect size
Indigenous School Ethos	6.43 (1.44)	5.99 (1.67)	1.332	0.186	0.29
School Governance and Community	4.51 (2.03)	3.39 (2.23)	2.137	0.036*	0.53
School Community Engagement	4.32 (1.80)	3.54 (1.76)	1.760	0.083	0.44
High Expectation Leadership Promotion	6.69 (1.58)	6.19 (2.08)	1.245	0.217	0.27
High Expectation Leadership Enactment	6.40 (1.48)	5.97 (2.11)	1.004	0.320	0.24
Indigenous Leadership (Teaching)	4.04 (1.74)	3.31 (1.79)	1.865	0.066	0.41
Indigenous Leadership (Roles)	3.39 (1.60)	2.74 (1.84)	1.739	0.086	0.38
Innovative School Staffing (Recruitment)	4.35 (1.88)	3.71 (2.15)	1.410	0.162	0.32
Innovative School Staffing (Capacity and Capacity Building)	3.96 (1.80)	3.46 (2.01)	1.147	0.255	0.26
Innovation School Modelling	4.94 (2.09)	3.26 (2.21)	3.387	0.001*	0.78
Sustainability (Teacher Capacity)	4.01 (1.69)	4.66 (2.28)	-1.233	0.229	0.32
Sustainability (Systemic Capacity)	5.15 (1.77)	5.38 (1.86)	-.507	0.614	0.13

N = 44-55 SSLC leaders, 24-34 non-SSLC leaders
* Significant at the 0.05 level

3.4.3.1 Indigenous School Ethos

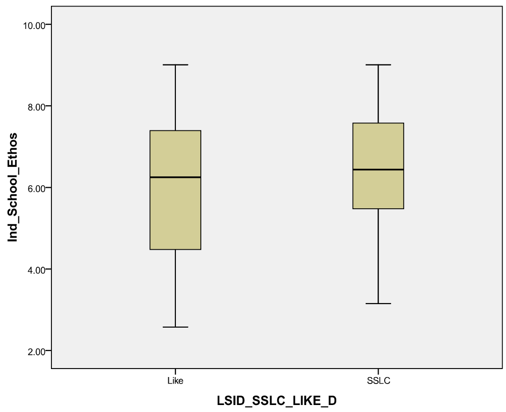


Figure 3.40 Indigenous School Ethos Box Plot

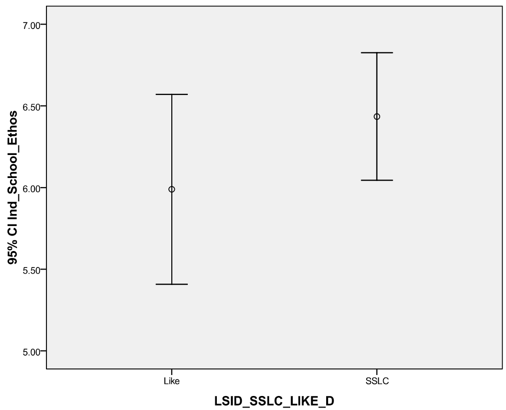


Figure 3.41 Indigenous School Ethos 95% Error Bar Chart

The box plot (Figure 3.40) and the 95% error bar chart (Figure 3.41) indicate a slight difference in level and distribution of the construct values between those leaders' observations in SSLC and non-SSLC schools. Approximately 60% of the SSLC schools are above the median value of the non-SSLC schools with a tighter distribution around the mean.

On average, leaders exposed to an SSLC environment reported higher levels of Indigenous School Ethos by almost half a point (M=6.43, SD=1.44) in their schools compared to those leaders not exposed to an SSLC environment (M=5.99, SD=1.67). However, this difference was not statistically significant t (87) =1.332, p>0.05; and represented a small effect size d=0.29.

3.4.3.2 School Governance and Community

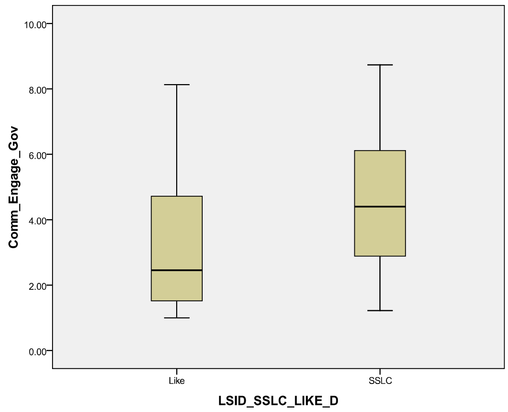


Figure 3.42 **School Governance and Community Box Plot**

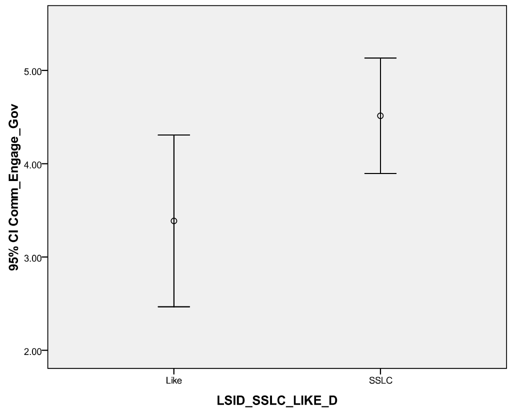


Figure 3.43 **School Governance and Community 95% Error Bar Chart**

The box plot (Figure 3.42) and the 95% error bar charts (Figure 3.43) indicate a slight difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Approximately 80% of the SSLC schools are above the median value of the non-SSLC schools.

On average leaders exposed to an SSLC environment reported higher levels of School Governance and Community (M=4.51, SD=2.03) in their schools compared to non-SSLC leaders (M=3.39, SD=2.23).

This difference was statistically significant t (67) =2.137, p<0.05; further this difference represented a medium effect size d=0.53.

Finding 15: SSLC leaders reported higher levels of school governance and community than non-SSLC leaders.

3.4.3.3 School Community Engagement

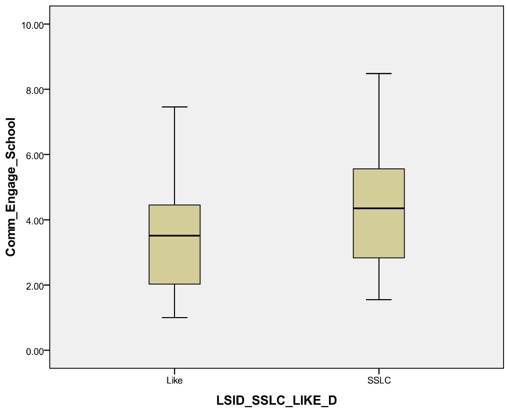


Figure 3.44 School Community Engagement Box Plot

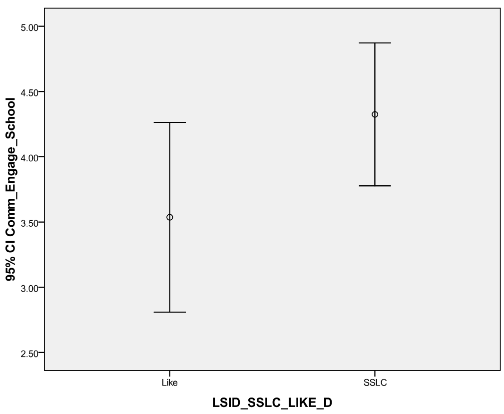


Figure 3.45 School Community Engagement 95% Error Bar Chart

The box plot (Figure 3.44) and the 95% error bar chart indicate a clear difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Approximately 75% of the SSLC schools are above the median value of the non-SSLC schools with a much tighter distribution around the mean.

Leaders exposed to an SSLC environment reported higher levels of School Community Engagement (M=4.32, SD=1.80) in their schools compared to those leaders not exposed to an SSLC environment (M=3.54, SD=1.76). This difference was approaching significance t (67) =1.760, p>.05. However, this difference is approaching a medium effect size d=0.44.

Finding 16: SSLC leaders were more likely to report higher levels of school community engagement than non-SSLC leaders.

3.4.3.4 High Expectation Leadership Promotion

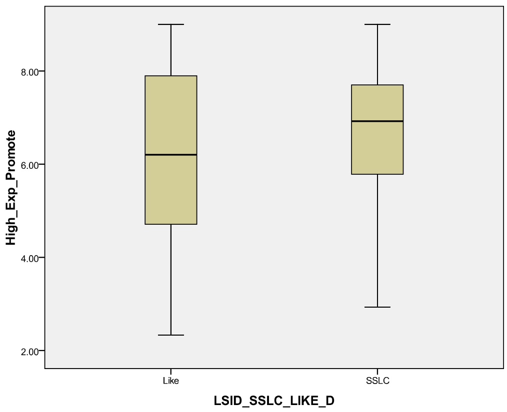


Figure 3.46 High Expectations Leadership Promotion Box Plot

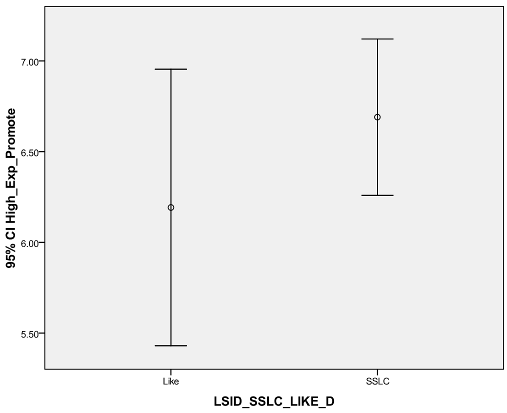


Figure 3.47 High Expectation Leadership Promotion 95% Error Bar Chart

The box plot (Figure 3.46) and the 95% error bars (Figure 3.47) indicate a clear difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Approximately 70% of the SSLC schools are above the median value of the non-SSLC schools with a much tighter distribution around the mean.

On average leaders exposed to an SSLC environment reported higher levels of High Expectations Leadership Promotion (M=6.69, SD=1.58) in their schools compared to those leaders not exposed to an SSLC environment (M=6.19, SD=2.08). This difference was not statistically significant t (83) =1.245, p>0.05. Furthermore, this difference translates to a small effect size d=0.27.

3.4.3.5 High Expectation Leadership Enactment

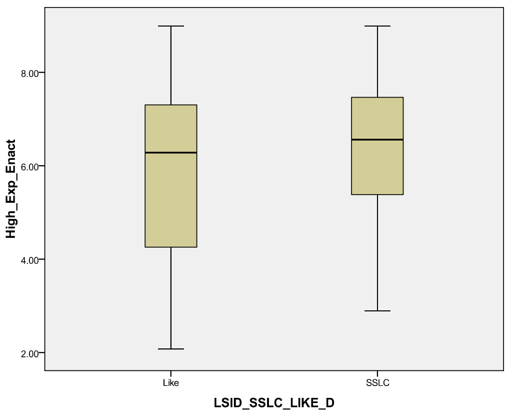


Figure 3.48 High Expectation leadership Enactment Box Plot

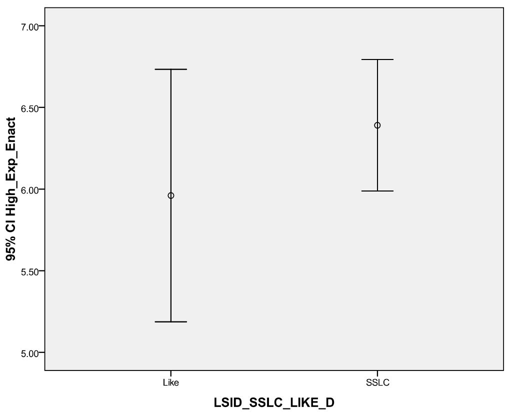


Figure 3.49 High Expectation Leadership Enactment 95% Error Bar Chart

The box plot (Figure 3.48) and the 95% error bar chart (Figure 3.49) indicate a difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Specifically the SSLC schools demonstrate a tighter clustering around a higher mean value than non-SSLC schools.

On average, leaders exposed to an SSLC environment reported higher levels of High Expectations Leadership Enactment (M=6.40, SD=1.48) in their schools compared to those leaders not exposed to an SSLC environment (M=5.97, SD=2.11). This difference was not statistically significant t (47.154) =1.004, p>0.05; further this difference equates to a small effect size d=0.24.

3.4.3.6 Indigenous Leadership (Teaching)

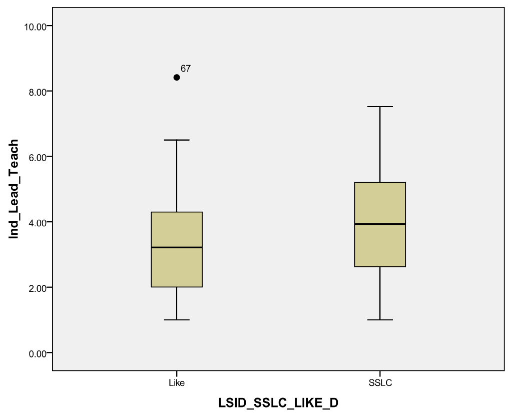


Figure 3.50 Indigenous Leadership (Teaching) Box Plot

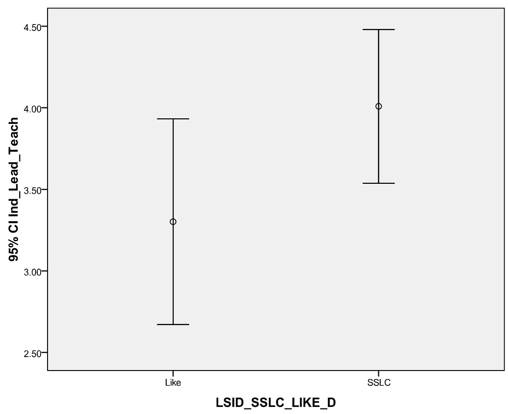


Figure 3.51 Indigenous Leadership (Teaching) 95% Error Bar Chart

The box plot (Figure 3.50) and the 95% error bar charts indicate a difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Specifically, about 65% of the SSLC schools are above the median value of the non-SSLC schools with a much tighter distribution around the mean.

Leaders exposed to an SSLC environment reported higher levels of Indigenous Leadership (Teaching) (M=4.04, SD=1.74) in their schools compared to those leaders not exposed to an SSLC environment (M=3.31, SD=1.79). This difference was trending towards significance t (85) =1.865, p>.05; although this difference was approaching a medium effect size d=0.41.

Finding 17: SSLC leaders were more likely to report higher levels of Indigenous leadership (teaching) than non-SSLC leaders.

3.4.3.7 Indigenous Leadership (Roles)

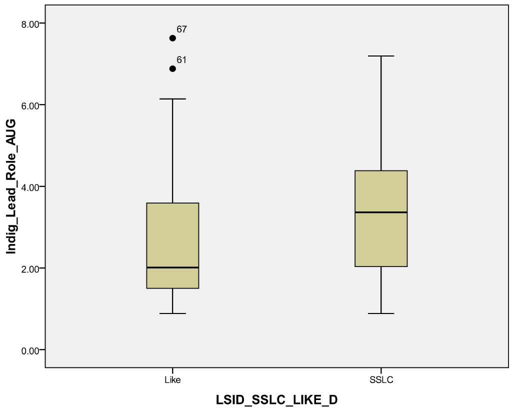


Figure 3.52 Indigenous Leadership (Roles) Box Plot

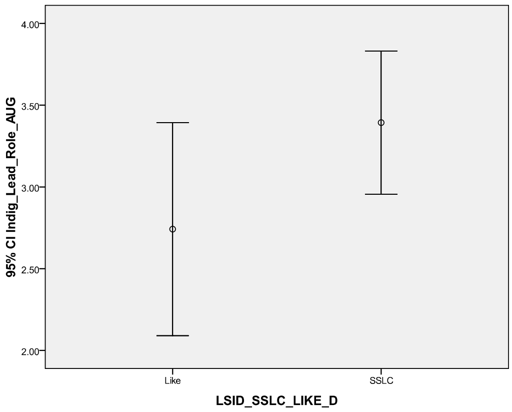


Figure 3.53 Indigenous Leadership (Roles) 95% Error Bar Chart

The box plot (Figure 3.52) and the 95% error bar chart (Figure 3.53) indicate a difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Specifically, about 75% of the SSLC schools are above the median value of the non-SSLC schools with a much tighter distribution around the mean.

Leaders exposed to an SSLC environment reported higher levels of Indigenous Leadership (Roles) (M=3.39, SD 1.60) in their schools compared to those leaders not exposed to an SSLC environment (M=2.74, SD=1.84). This difference was trending towards significance t (85) =1.739, p>.05; further this difference approached a medium effect size d=0.38.

Finding 18: SSLC leaders were more likely to report higher levels of Indigenous leadership (roles) than non-SSLC leaders.

3.4.3.8 Innovative School Staffing (Recruitment)

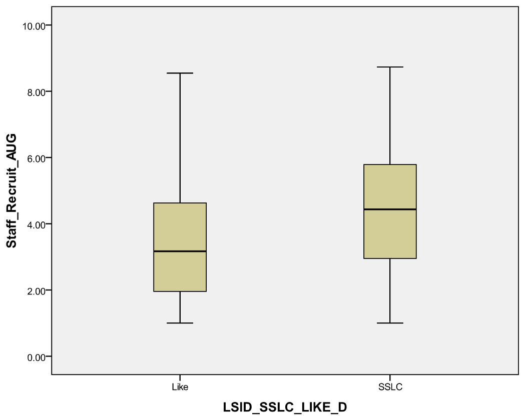


Figure 3.54 **Innovative School Staffing (Recruitment) Box Plot**

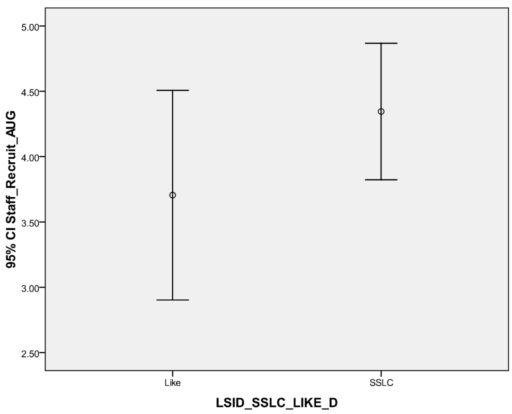


Figure 3.55 **Innovative School Staffing (Recruitment) 95 % Error Bar Chart**

The box plot (Figure 3.54) and the 95% error bar charts (Figure 3.55) indicate a difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Specifically, about 70% of the SSLC schools are above the median value of the non-SSLC schools with a much tighter distribution around the mean.

On average, leaders exposed to an SSLC environment reported higher levels of Innovative School Staffing (Recruitment) (M=4.35, SD=1.88) in their schools compared to those leaders not exposed to an SSLC environment (M=3.71, SD=2.15). This difference was not statistically significant t (80) =1.410, p>0.05; further this difference showed a small effect size d=0.32.

3.4.3.9 Innovative School Staffing (Capacity and Capacity Building)

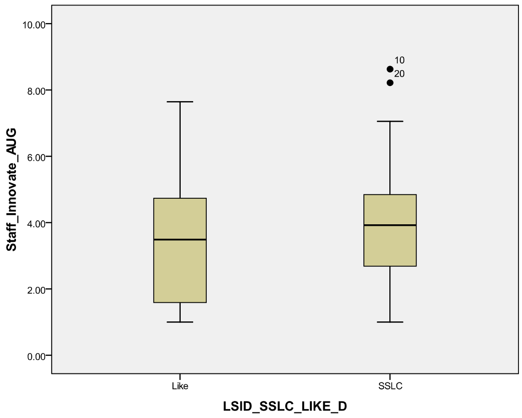


Figure 3.56 Innovative School Staffing (Capacity and Capacity Building) Box Plot

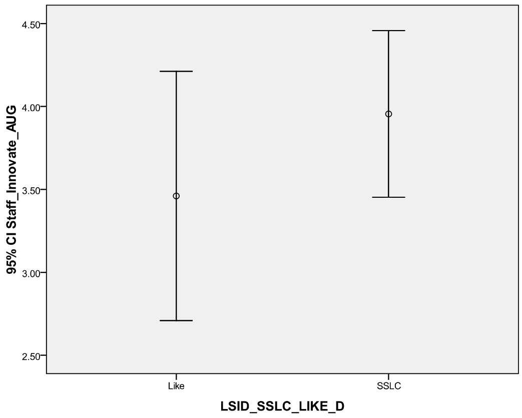


Figure 3.57 Innovative School Staffing (Capacity and Capacity Building) 95% Error Bar Chart

The box plot (Figure 3.56) and the 95 % error bar charts (Figure 3.57) indicate a difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Approximately 60% of the SSLC schools are above the median value of the non-SSLC schools with a much tighter distribution around the mean.

On average, leaders exposed to an SSLC environment reported higher levels of Innovative School Staffing (M=3.96, SD=1.80) in their schools compared to those leaders not exposed to an SSLC environment (M=3.46, SD=2.01). This difference was not statistically significant t (80) =1.147, p>0.05; further this difference showed a small effect size d=0.26.

3.4.3.10 Innovative School Modelling

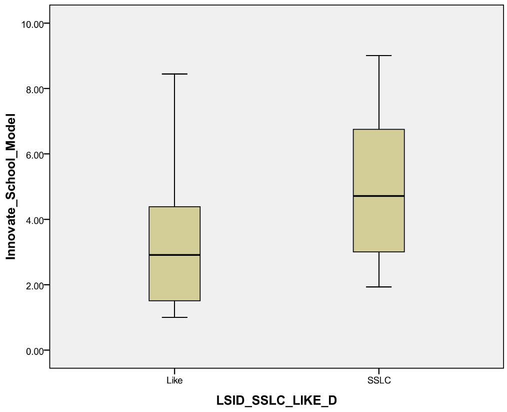


Figure 3.58 Innovative School Modelling Box Plot

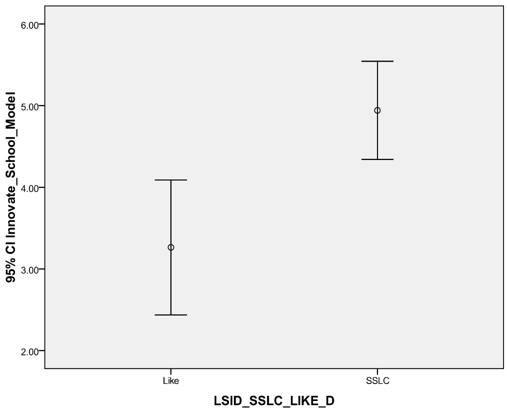


Figure 3.59 Innovative School Modelling 95% Error Bar Chart

The plots indicate a difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools that do not have an SSLC influence. Approximately 75% of the SSLC schools are above the median value of the non-SSLC schools with a much tighter distribution around the mean.

SSLC leaders reported higher levels of Innovative School Modelling (M=4.94, SD=2.09) compared to non-SSLC leaders (M=3.26, SD=2.21).

This difference was statistically significant t (77) =3.387, p<0.05; further this difference showed a large effect size d=0.78.

Finding 19: SSLC leaders reported higher levels of innovative school modelling compared to non-SSLC leaders.

3.4.3.11 Sustainability (Teacher Capacity)

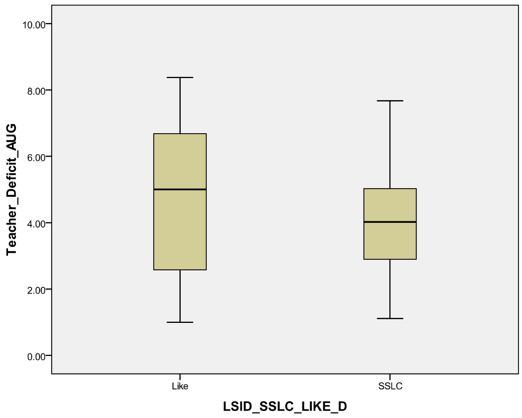


Figure 3.60 Sustainability (Teacher Capacity) Box Plot

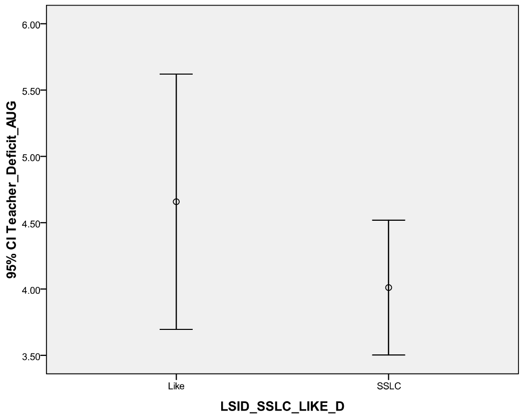


Figure 3.61 Sustainability (Teacher Capacity) 95% Error Bar Chart

The box plot (Figure 3.60) and the 95% error bar charts (Figure 3.61) indicate a difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Approximately 60% of the SSLC schools are below the median value of the non-SSLC schools with a much tighter distribution around the mean.

On average, leaders exposed to an SSLC environment reported lower levels of Teacher Capacity in Indigenous Education (M=4.01, SD=1.69) in their schools compared to those leaders not exposed to an SSLC environment (M=4.66, SD=2.28). This difference was not statistically significant t (37.415) =-1.233; p>0.05; further this difference showed a small effect size d=0.32.

3.4.3.12 Sustainability (Systemic Capacity)

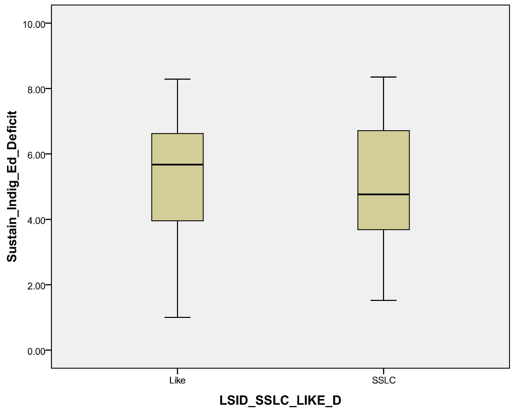


Figure 3.62 Sustainability (Systemic Capacity) Box Plot

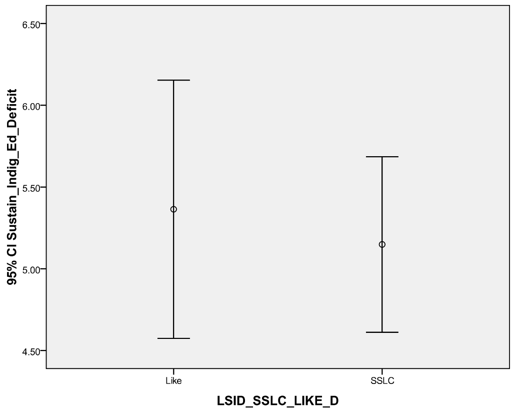


Figure 3.63 Sustainability (Systemic Capacity) 95% Error Bar Chart

The box plot (Figure 3.62) and the error bar chart (Figure 3.63) indicate significant overlap in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. It is unlikely that there will be a significant difference between SSLC and non-SSLC schools.

On average leaders exposed to an SSLC environment reported lower levels of Systemic Capacity (M=5.15, SD=1.77) in their schools compared to those leaders not exposed to an SSLC environment (M=5.38, SD=1.86). This difference was not statistically significant t (67) =-0.507, p>0.05; further this difference showed a small effect size d=0.13.

3.4.3.13 Analysis of Covariance (ANCOVA)

To measure the possible effect of other determiners on the level of the construct and to adjust for possible confounding effects, a factorial ANCOVA (see Appendix 3.5) was also employed. The model consisted of the construct as the dependent variable with the categorical variables SSLC exposure (yes, no), location (metropolitan VS provincial, remote/very remote), and school type (primary, secondary) being entered as fixed factors. The continuous variable percentage of Indigenous students enrolled was entered as covariates.

The ANCOVA models reinforced the results of the independent sample T-tests with the following comments.

Indigenous School Ethos: Indigenous School Ethos was found to be strongly related to school level; leaders from primary schools (M=6.67) reported higher scores on this construct than leaders from secondary schools (M=5.44). This difference was significant, $p<.01$; partial $\eta^2= 0.10$. There was also a trend for % Indigenous to affect this construct ($p=.087$; partial $\eta^2= 0.039$). However, the manifestations of school ethos tapped by the items may have more relevance and practicality in primary school compared to secondary school. For example, the display of artefacts to promote Indigenous culture (LSSC4) may be more visible to students and staff in small primary or combined schools, compared to secondary schools.

Finding 20: Primary school leaders reported higher levels of Indigenous school ethos than secondary school leaders.

School Governance and Community

The significant effect of SSLC status was reflected in the ANCOVA, where a medium effect size was found for SSLC status (partial $\eta^2 = 0.090$). Percent of Indigenous students enrolled had a larger effect on scores for the School Governance and Community construct (partial $\eta^2 = 0.130$). This suggests that a higher % of Indigenous students would enable greater opportunity for involvement of the Indigenous community.

Finding 21: Schools with a higher percentage of Indigenous students reported higher levels of school governance and community.

High Expectations Promotion

The ANCOVA showed a large effect for school level ($p<.05$; partial $\eta^2= 0.167$). More positive scores were reported by primary (M=7.05) schools compared to secondary schools (M=5.27).

Finding 22: While there was no effect for SSLC, primary school leaders reported higher levels of high expectations promotion than secondary school leaders.

High Expectations Enactment

The ANCOVA showed a large effect for school level ($p<.01$; partial $\eta^2= 0.190$). More positive scores were reported by primary (M=6.83) schools compared to secondary schools (M=5.04).

Finding 23: While there was no effect for SSLC, primary school leaders reported higher levels of high expectations enactment than secondary school leaders.

Indigenous Leadership (Teaching)

The ANCOVA demonstrated a significant but small effect for % Indigenous (p<.05; partial η^2= 0.054)

Finding 24: While there was no effect for SSLC, leaders of schools with higher percentages of Indigenous students enrolled reported higher levels of Indigenous leadership (teaching).

Indigenous Leadership (Roles): The ANCOVA demonstrated a significant medium effect for % Indigenous (p<.01; partial η^2= 0.122).

Finding 25: While there was no effect for SSLC, leaders of schools with higher percentages of Indigenous students enrolled reported higher levels of Indigenous leadership (roles).

Innovative School Staffing (Recruitment)

The ANCOVA demonstrated a significant large effect for % Indigenous (p<.01; partial η^2= 0.187).

Finding 26: While there was no effect for SSLC, leaders of schools with higher percentages of Indigenous students enrolled reported higher levels of innovative school staffing recruitment.

Innovative School Staffing (Capacity and Capacity Building)

The ANCOVA demonstrated a significant large effect for % Indigenous (p<.01; partial η^2= 0.196). These questions referred to staffing innovation as a result of capacity and capacity building.

Finding 27: While there was no effect for SSLC, leaders of schools with higher percentages of Indigenous students enrolled reported higher levels of innovative school staffing.

Innovative School Modelling

The ANCOVA demonstrated significant main effects for % Indigenous (p<.05; partial η^2= 0.073) and SSLC status (p<.01; partial η^2= 0.104), both of which were associated with medium effects. School level was less influential than SSLC status for this construct (p>.05; partial η^2= 0.021), and findings were in favour of primary (M=4.01) schools compared to secondary schools (M=3.81). These questions referred to hiring of Indigenous staff or expertise.

Finding 28: In addition to the SSLC effect, leaders of schools with higher percentages of Indigenous students enrolled reported higher levels of innovative school modelling.

Sustainability (Teacher Capacity)

The ANCOVA revealed that there was a large difference between primary (M=3.69) and secondary (M=5.50) schools in terms of teacher capacity (p<.01; partial η^2= 0.151). This finding showed that secondary school leaders felt that they were the more limited (compared to primary school leaders) with respect to teacher capacity and resources.

Finding 29: While there was no effect for SSLC, primary school leaders felt that teacher capacity was less of a constraint on sustainability than secondary school leaders.

3.5 Pedagogical Practices Teacher Survey

3.5.1 Introduction

3.5.2 The Process

Teachers were required to report the amount of time in minutes per week that they spent on each activity in the questionnaire. Minute responses to all items were rescaled to a percentage of 1200, which was based on an assumption of 25 hours contact time with students per week, or an average of five hours per day. An example of the formula is shown below:

TSPEDP1P=(TSPEDP1 / 1200)*100.

The measurement model is formative and, as such, unsuitable for exploratory factor analysis. An index was generated as a measure of teachers' pedagogical/curriculum approaches. The score on the index for each category was calculated by summing percentage on each item and averaging.

Face and construct validity for item in each category was established through review of the literature, consultation with curriculum experts, discussion of items with SSLC staff, and validation through focus group consultation with teachers with experience in Indigenous and non-Indigenous contexts. Experts and teachers were asked to generate and reword items in an attempt to describe approaches to curriculum content, general pedagogical orientation and teaching approaches that would be operational in all settings with Indigenous students, as comprehensively as possible. A decision was made to deliberately combine curriculum and pedagogy into a single scale, when consultations with teachers indicated that respondents had trouble differentiating 'content' from 'instruction' and tended to agglomerate the two into a general approach.

The literature consulted included both conventional pedagogy coding/observation schemes (e.g., Productive Pedagogies, NSW Pedagogies, the Singapore Pedagogy Coding Model) (e.g., Ladwig, 2004), general curriculum theory (e.g., Bernstein, 1990; Deng & Luke, 2008) and field/discipline specific curriculum literature (e.g., critical literacy, progressivism). The items, then aim to describe the full range of conventionally described pedagogic/curriculum approaches that might occur in SSLC and non-SSLC schools with Indigenous students.

The model further acknowledged the reported differences between primary and secondary approaches in curriculum, while allowing for cross-over in shared KLAs and pedagogical approaches.

3.5.3 Primary Teachers

A total of 107 primary teachers completed the pedagogical practices section of the survey. There was a further 20 cases (16% of 127) who identified as primary teachers for which data was missing in a non-random pattern which suggested item response fatigue.

The primary school items fall into seven categories as follows:

- Basic Skills
- Canonical
- Community/ Indigenous
- Progressive
- Critical Literacy
- Assessment
- Classroom Management

In what follows, a conventional definition for each curriculum/pedagogy category is provided. Minor modifications in the wording of items was undertaken to accommodate the differences between primary and secondary schools. Descriptives for each item set are also provided to give and overview of response patterns.

Basic Skills – Primary

The basic skills approach in primary schools entails a focus on the teaching and learning of core behaviours, skills and competences, often through direct instructional models. It entails the breaking down of instruction into specific behaviour or knowledge objectives that are observable and assessable. The aim of this approach is the systematic and incremental teaching of literacy and numeracy, with each lesson developmentally building upon prior skill or knowledge, yielding testable levels of skill acquisition and knowledge. The items mapping the Basic Skills – Primary index are listed in Table 3.48.

Table 3.48 Basic Skills - Primary Item Set

Item	Question
TSPEDP1P	4.1a) Teacher-directed instruction in basic skills of initial literacy (e.g., alphabet, vocabulary, phonics, writing skills)
TSPEDP2P	4.2a) Teacher-directed instruction in the basic skills of numeracy (e.g., number, count, basic functions)
TSPEDP3P	4.3a) Lessons where students are completing worksheets with short answers, fill-in-the-blanks, or multiple choice formats
TSPEDP4P	4.4a) Preparing students for standardised testing formats and test taking skills
TSPEDP5P	4.5a) Teaching a structured, step-by-step curriculum package according to teacher guidebook (e.g., Jolly Phonics, Go-Maths, Multilit, DISTAR)
TSPEDP26P	4.26a) Providing summaries of the previous lessons during class

Descriptives

Table 3.49 Basic Skills – Primary Descriptive Statistics

Descriptives

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDP1P	107	.00	375.00	23.2445	3.77685	39.06802	7.069	.234	62.666	.463
TSPEDP2P	107	.00	375.00	18.0514	3.63468	37.59744	8.282	.234	78.152	.463
TSPEDP3P	107	.00	50.00	4.5592	.73056	7.55693	3.390	.234	14.222	.463
TSPEDP4P	107	.00	41.67	2.7780	.54497	5.63725	4.289	.234	23.547	.463
TSPEDP5P	107	.00	30.00	4.7625	.77974	8.06569	1.931	.234	2.831	.463
TSPEDP26P	107	.00	83.33	4.0350	1.00573	10.40340	6.399	.234	43.827	.463

Canonical – Primary

The canonical focus in primary schooling emphasises the engagement with traditional cultural and scientific content thought to be of high quality, depth, significance and value. The term refers to the belief that there is a classical or traditional 'corpus' – a canon – of consensually acknowledged scientific knowledge and literary content. This content would be classified in traditional disciplines, fields or school subjects (KLAs) and representative of mainstream, dominant culture.

Table 3.50 Canonical – Primary Item Set

Item	Question
TSPEDP15P	4.15a) Lessons that focus on traditional Australian/English literary content (e.g., Mem Fox, Roald Dahl, E.B White)
TSPEDP16P	4.16a) Lessons that focus on key facts and concepts for KLA scientific content and knowledge
TSPEDP17P	4.17a) Lessons that focus on key facts and concepts of KLA Australian and World history
TSPEDP18P	4.18a) Lessons that focus on knowledge of traditional academic value (e.g., essays, laboratory reports, sonnets)

Descriptives

Table 3.51 Canaonical – Primary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDP15P	107	.00	50.00	6.9556	1.06749	11.04224	2.657	.234	7.236	.463
TSPEDP16P	107	.00	416.67	8.5413	3.88253	40.16117	10.087	.234	103.385	.463
TSPEDP17P	107	.00	416.67	7.1565	3.92348	40.58477	9.904	.234	100.447	.463
TSPEDP18P	107	.00	416.67	6.5717	3.96327	40.99635	9.685	.234	96.999	.463

Community/ Indigenous – Primary

Community/Indigenous orientation focuses on Indigenous knowledge, culture and language as media and objects of study, and on the study of students' 'real world' community knowledge, institutions and media.

Table 3.52 Community/Indigenous - Primary Item Set

Item	Question
TSPEDP9P	4.9a) Lessons and activities on local Indigenous content in the curriculum (e.g., local history, cultural practices, Aboriginal and Torres Strait Islander terms and locations)
TSPEDP10P	4.10a) Lessons or activities that involve study of local languages, Aboriginal English, and/or Kriol
TSPEDP11P	4.11a) Lessons and activities where students work on real world knowledge (e.g., how to deal with institutions, how to access services, using media)
TSPEDP19P	4.19a) Lessons and activities that involve the study and use of Indigenous literature (e.g., Sally Morgan, Dianne Lucas, Eva & Pat Pootchemunka)
TSPEDP20P	4.20a) Lessons and activities where issues of Indigenous identity are explored and discussed

Descriptives

Table 3.53 Community/Indigenous – Primary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDP9P	107	.00	25.00	3.5810	.56066	5.79954	2.572	.234	6.426	.463
TSPEDP10P	107	.00	300.00	3.4385	2.80337	28.99828	10.282	.234	106.120	.463
TSPEDP11P	107	.00	507.50	8.2991	4.75335	49.16907	10.067	.234	102.996	.463
TSPEDP19P	107	.00	21.67	1.9299	.35618	3.68432	2.772	.234	9.365	.463
TSPEDP20P	107	.00	150.00	3.5927	1.45460	15.04651	8.947	.234	86.561	.463

Progressive – Primary

The progressive orientation in primary schooling tends to focus on activities, experience as a means for student-centred learning. The emphasis is on individual and group learning processes, a negotiated curriculum based on student interest, problem solving and creativity.

Table 3.54 Progressive – Primary Item Set

Item	Question
TSPEDP6P	4.6a) Lessons and activities which feature 'hands on' experience and 'learning by doing' (e.g., building and making things, art work, physical activities)
TSPEDP7P	4.7a) Play-based activities to generate high levels of student involvement and participation (e.g., developmental drama, group games, creative writing, and acting)
TSPEDP12P	4.12a) Individualised instruction following an Individual Educational Program
TSPEDP13P	4.13a) Independent small group work on assigned tasks

TSPEDP14P	4.14a) Lessons and activities on content that are negotiated with students on the basis of interest

Descriptives

Table 3.55 Progressive – Primary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDP6P	107	.00	166.67	16.3668	1.98308	20.51315	4.389	.234	27.552	.463
TSPEDP7P	107	.00	83.33	8.1931	1.14562	11.85034	3.605	.234	16.999	.463
TSPEDP12P	107	.00	50.00	5.1340	.79958	8.27094	2.883	.234	10.415	.463
TSPEDP13P	107	.00	375.00	14.4883	3.64898	37.74539	8.475	.234	80.190	.463
TSPEDP14P	107	.00	375.00	7.2165	3.49994	36.20367	10.078	.234	103.241	.463

Critical Literacy – Primary

Critical literacy in the primary school focuses on critical analyses of texts and media, on critical analysis and engagement with society and social institutions.

Table 3.56 Critical Literacy – Primary Item Set

Item	Question
TSPEDP32P	4.32a) Lessons that focus on the critical analysis of underlying messages in texts
TSPEDP33P	4.33a) Lessons that teach students how texts position them as members of society
TSPEDP34P	4.34a) Lessons that ask students to consider critical perspectives on an issue
TSPEDP35P	4.35a) Lessons that engage students in a critical discussion of television, movies, web pages, music, art, and other means of expression

Descriptives

Table 3.57 Critical Literacy – Primary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDP32P	107	.00	66.67	5.3777	.94854	9.81177	4.102	.234	19.544	.463
TSPEDP33P	107	.00	66.67	3.1153	.74482	7.70453	6.306	.234	47.210	.463
TSPEDP34P	107	.00	58.33	3.4696	.71272	7.37242	5.437	.234	35.072	.463
TSPEDP35P	107	.00	83.33	4.1090	.94891	9.81560	6.128	.234	43.595	.463

Assessment – Primary

An assessment orientation in primary schools focuses on the use of a range of techniques for evaluating and tracking student achievement and progress, and on providing developmental, diagnostic and formative feedback to students on their performance.

Table 3.58 Assessment – Primary Item Set

Item	Question
TSPEDP8P	4.8a) Administering individual and/or small group developmental diagnostic assessment tasks (e.g., individual language development tasks, individual reading aloud)
TSPEDP21P	4.21a) Administering tests/quizzes to assess student learning (non-standardised or standardised, e.g., spelling, reading tests)
TSPEDP22P	4.22a) Providing written feedback on student work
TSPEDP23P	4.23a) Discussing assessment criteria and standards with students on assignments
TSPEDP24P	4.24a) Having students evaluate their own or their classmates' work
TSPEDP25P	4.25a) Reviewing students' homework they have prepared in class or at home
TSPEDP30P	4.30a) Meeting with other teachers to compare or moderate individual student progress
TSPEDP31P	4.31a) Providing students verbal or written feedback on their progress

Descriptives

Table 3.59 Assessment-Primary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDP8P	107	.00	30.00	5.2321	.54273	5.61409	1.884	.234	4.298	.463
TSPEDP21P	107	.00	366.67	6.2975	3.40884	35.26128	10.260	.234	105.826	.463
TSPEDP22P	107	.00	83.33	5.1005	.93425	9.66399	5.601	.234	41.117	.463
TSPEDP23P	107	.00	41.67	2.9626	.49774	5.14862	5.277	.234	33.729	.463
TSPEDP24P	107	.00	83.33	2.8995	.81162	8.39547	8.640	.234	81.532	.463
TSPEDP25P	107	.00	83.33	3.0265	.85954	8.89110	7.395	.234	64.092	.463
TSPEDP30P	107	.00	75.00	4.6121	.79203	8.19279	6.464	.234	52.416	.463
TSPEDP31P	107	.00	125.00	5.2516	1.22148	12.63507	8.319	.234	77.764	.463

Classroom Management – Primary

A classroom management orientation in primary schools focuses on maintaining order an managing student behaviour in the classroom.

Table 3.60 Classroom Management – Primary Item Set

Item	Question
TSPEDP27P	4.27a) Time spent explicitly managing classroom behaviour
TSPEDP28P	4.28a) Time spent talking about classroom rules
TSPEDP29P	4.29a) Time spent on classroom administrative duties related to students (e.g., roll-taking, etc.)

Descriptives

Table 3.61 Classroom Management – Primary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDP27P	107	.00	100.00	13.4174	1.89533	19.60542	2.842	.234	8.635	.463
TSPEDP28P	107	.00	83.33	4.7998	.94195	9.74359	5.809	.234	41.689	.463
TSPEDP29P	107	.00	83.33	4.8707	.96324	9.96380	6.245	.234	43.772	.463

3.5.4 Secondary Teachers

A total of 200 secondary teachers completed the pedagogical practices section of the survey. There was a further 58 cases (22% of 258) who identified as secondary teachers for which data was missing in a non-random pattern which suggested item response fatigue.

The secondary school items fall into seven categories as follows:

- Basic Skills;
- Canonical;
- Community/ Indigenous;
- Progressive;
- Critical Literacy;
- Assessment;
- Classroom Management; and
- Vocational Education.

In what follows, a conventional definition for each curriculum/pedagogy category is provided. Minor modifications in the wording of items was undertaken to accommodate the differences between primary and secondary schools. The category of vocational education was added to Secondary curriculum/pedagogy. Descriptives for each item set are also provided to give an overview of response patterns.

Basic Skills – Secondary

The basic skills approach in secondary schools entails a focus on the teaching and learning of core behaviours, skills and competences, often through direct instructional models. It entails the breaking down of instruction into specific behaviour or knowledge objectives that are assessable and observable. The aim of this approach is the systematic and incremental teaching of literacy and numeracy, with each lesson developmentally building upon prior skill or knowledge. The items mapping the Basic Skills – Secondary index are listed in Table 3.62.

Table 3.62 **Basic Skills –Secondary Item Set**

Item	Question
TSPEDS1P	4.1b) Teacher-directed instruction in basic literacy skills (e.g., decoding, reading comprehension, genre instruction)
TSPEDS2P	4.2b) Teacher-directed instruction in the basic numeracy (e.g., number, count, basic functions)
TSPEDS3P	4.3b) Lessons where students are completing worksheets with short answers, fill-in the-blanks, or multiple choice formats
TSPEDS4P	4.4b) Preparing students for standardised testing formats and test taking skills
TSPEDS5P	4.5b) Teaching a structured, step-by-step curriculum package according to teacher guidebook (e.g., Go-Maths, SRA)
TSPEDS26P	4.26b) Providing summaries of the previous lessons during class

Descriptives

Table 3.63 **Basic Skills – Secondary Descriptives**

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDS1P	200	.00	916.67	11.8550	4.62694	65.43480	13.434	.172	186.309	.342
TSPEDS2P	200	.00	233.33	6.5546	1.34329	18.99693	9.052	.172	103.074	.342
TSPEDS3P	200	.00	375.00	6.6904	1.93495	27.36432	12.447	.172	167.026	.342
TSPEDS4P	200	.00	416.67	4.8971	2.09680	29.65319	13.599	.172	189.525	.342
TSPEDS5P	200	.00	166.67	3.0142	.97676	13.81354	9.100	.172	100.924	.342
TSPEDS26P	200	.00	16.67	2.4588	.23358	3.30333	2.692	.172	8.015	.342

Canonical – Secondary

The canonical focus in secondary schooling focuses on the engagement with traditional cultural and scientific content thought to be of high quality. The term refers to the belief that there is a classical or traditional 'corpus' – a canon – of consensually acknowledged scientific knowledge and literary content. This content would be classified in traditional disciplines, fields or school subjects (KLAs) and representative of mainstream, dominant culture. In the secondary school, this entails a focus on higher order knowledge, advanced technical registers and specialised genres of disciplinary fields.

Table 3.64 **Canonical – Secondary Item Set**

Item	Question
TSPEDS15P	4.15b) Lessons that focus on traditional Australian/English literary content (e.g., Marsden, Shakespeare, Orwell)
TSPEDS16P	4.16b) Lessons that focus on key facts and concepts for KLA scientific content and knowledge
TSPEDS17P	4.17b) Lessons that focus on key facts and concepts of KLA Australian and World History
TSPEDS18P	4.18b) Lessons that focus on knowledge of traditional academic value (e.g., essays, laboratory reports, sonnets)

Descriptives

Table 3.65 Canonical – Secondary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDS15P	200	.00	33.33	1.4875	.34993	4.94870	4.505	.172	22.751	.342
TSPEDS16P	200	.00	104.17	6.5804	.89923	12.71702	3.614	.172	19.124	.342
TSPEDS17P	200	.00	70.00	2.2242	.50319	7.11612	6.573	.172	52.448	.342
TSPEDS18P	200	.00	150.00	4.2863	.87960	12.43945	8.813	.172	96.839	.342

Community/Indigenous – Secondary

Community/Indigenous orientation focuses on Indigenous knowledge, culture and language as media and objects of study, and on the study of students' 'real world' community knowledge, institutions and media. In the secondary school, this may entail engagement with an acknowledged 'canon' of Indigenous literature, writers and artists, on 'embedded' content knowledge and activities.

Table 3.66 Community/Indigenous – Secondary Item Set

Item	Question
TSPEDS9P	4.9b) Lessons and activities on local Indigenous content in the curriculum (e.g., local history, cultural practices, Aboriginal and Torres Islander Strait terms and locations)
TSPEDS10P	4.10b) Lessons or activities that involve study of local languages, Aboriginal English, and/or Kriol
TSPEDS11P	4.11b) Lessons and activities where students work on real world knowledge (how to deal with institutions, how to access services, using media)
TSPEDS19P	4.19b) Lessons and activities that involve the study and use of Indigenous literature (e.g., Morgan, Ward, Davis, Mudrooroo)
TSPEDS20P	4.20b) Lessons and activities where issues of Indigenous identity are explored and discussed

Descriptives

Table 3.67 Community/Indigenous – Secondary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDS9P	200	.00	40.00	1.5517	.29216	4.13179	6.117	.172	47.467	.342
TSPEDS10P	200	.00	11.67	.3025	.09543	1.34955	5.628	.172	35.485	.342
TSPEDS11P	200	.00	116.67	6.6837	1.01217	14.31429	4.823	.172	27.313	.342
TSPEDS19P	200	.00	16.67	.5521	.14035	1.98488	5.238	.172	31.942	.342
TSPEDS20P	200	.00	41.67	1.7025	.34496	4.87853	5.882	.172	41.808	.342

Progressive – Secondary

The progressive orientation in secondary schooling also tends to focus on activities, experience as a means for student-centred learning. The emphasis is on individual and group learning processes, a negotiated curriculum based on student interest, problem solving and creativity. In the secondary school, a common focus is on integrated projects or rich tasks which require the bringing together of inter and multidisciplinary knowledge.

Table 3.68 Progressive – Secondary Item Set

Item	Question
TSPEDS6P	4.6b) Lessons and activities which feature 'hands on' experience and 'learning by doing' (e.g., building and making things, art work, physical activities)
TSPEDS7P	4.7b) Project-based activities to generate high levels of student involvement and participation
TSPEDS12P	4.12b) Individualised instruction following an Individual Educational Program
TSPEDS13P	4.13b) Independent small group work on assigned tasks
TSPEDS14P	4.14b) Lessons and activities on content that are negotiated with students on the basis of interest

Descriptives

Table 3.69 Progressive – Secondary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDS6P	200	.00	116.67	13.4917	1.38119	19.53298	2.290	.172	6.255	.342
TSPEDS7P	200	.00	75.00	8.0979	.83854	11.85882	2.833	.172	10.515	.342
TSPEDS12P	200	.00	1166.67	13.6617	7.17605	101.48467	10.124	.172	105.290	.342
TSPEDS13P	200	.00	116.67	7.5050	1.02338	14.47282	4.856	.172	28.731	.342
TSPEDS14P	200	.00	116.67	4.2383	.79256	11.20855	6.696	.172	57.150	.342

Critical Literacy – Secondary

Critical literacy in the primary school focuses on critical analyses of texts and media, on critical analysis and engagement with society and social institutions.

Table 3.70 Critical Literacy – Secondary Item Set

Item	Question
TSPEDS32P	4.32b) Lessons that focus on the critical analysis of underlying messages in texts
TSPEDS33P	4.33b) Lessons that teach students how texts position them as members of society
TSPEDS34P	4.34b) Lessons that ask students to consider critical perspectives on an issue
TSPEDS35P	4.35b) Lessons that engage students in a critical discussion of television, movies, web pages, music, art, and other means of expression

Descriptives

Table 3.71 Critical Literacy – Secondary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDS32P	200	.00	33.33	2.3396	.33176	4.69172	3.232	.172	13.160	.342
TSPEDS33P	200	.00	33.33	1.8375	.30027	4.24644	4.035	.172	20.852	.342
TSPEDS34P	200	.00	41.67	2.7596	.36354	5.14128	4.675	.172	27.827	.342
TSPEDS35P	200	.00	70.00	3.3033	.56458	7.98436	5.389	.172	36.253	.342

Assessment – Secondary

An assessment orientation in schools focuses on the use of a range of techniques for evaluating and tracking student achievement and progress, and on providing development, diagnostic and formative feedback to students on their performance. In secondary schools, the focus on assessment increases in the senior years, leading to high stakes summative assessment.

Table 3.72 Assessment – Secondary Item Set

Item	Question
TSPEDS8P	4.8b) Administering individual and/or small group developmental diagnostic assessment tasks (e.g., individual development tasks, individual reading, assisted writing)
TSPEDS21P	4.21b) Administering tests/quizzes to assess student learning (non-standardised or standardised, e.g., spelling, reading tests)
TSPEDS22P	4.22b) Providing written feedback on student work
TSPEDS23P	4.23b) Discussing assessment criteria and standards with students on assignments
TSPEDS24P	4.24b) Having students evaluate their own or their classmates' work
TSPEDS25P	4.25b) Reviewing students' homework they have prepared in class or at home
TSPEDS30P	4.30b) Meeting with other teachers to compare or moderate individual student progress
TSPEDS31P	4.31b) Providing students verbal or written feedback on their progress

Descriptives

Table 3.73 Assessment – Secondary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDS8P	200	.00	41.67	2.4954	.34573	4.88938	4.568	.172	28.379	.342
TSPEDS21P	200	.00	43.33	2.9363	.35881	5.07431	4.552	.172	27.613	.342
TSPEDS22P	200	.00	33.33	3.3783	.28870	4.08283	3.102	.172	15.288	.342
TSPEDS23P	200	.00	23.33	2.7279	.23112	3.26859	3.699	.172	17.547	.342
TSPEDS24P	200	.00	41.67	1.9479	.27091	3.83127	6.947	.172	63.954	.342
TSPEDS25P	200	.00	23.33	2.6958	.25317	3.58038	2.668	.172	9.081	.342

TSPEDS30P	200	.00	41.67	3.0825	.38262	5.41104	4.914	.172	29.729	.342
TSPEDS31P	200	.00	116.67	4.4946	.65772	9.30151	9.215	.172	107.170	.342

Classroom Management – Secondary

A classroom management orientation in primary schools focuses on maintaining order and managing student behaviour in the classroom.

Table 3.74 Classroom Management – Secondary Item Set

Item	Question
TSPEDS27P	4.27b) Time spent explicitly managing classroom behaviour
TSPEDS28P	4.28b) Time spent talking about classroom rules
TSPEDS29P	4.29b) Time spent on classroom administrative duties related to students (e.g., roll-taking, etc.)

Descriptives

Table 3.75 Classroom Management – Secondary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDS27P	200	.00	75.00	7.6333	.76716	10.84931	2.935	.172	11.825	.342
TSPEDS28P	200	.00	50.00	2.4004	.33896	4.79357	6.091	.172	51.488	.342
TSPEDS29P	200	.00	33.33	3.6712	.32563	4.60513	2.663	.172	10.066	.342

Vocational Education – Secondary

The vocational education orientation in secondary schools is meant to create an educational pathway to further and specialised job training and/or employment. It entails specialised vocational education curriculum content and training modules that may lead to certification and apprenticeship. In the secondary school it may entail workplace or community work experience.

Table 3.76 Vocational Education – Secondary Item Set

Item	Question
TSPEDS36P	4.36b) Lessons and activities that are part of vocational education training modules
TSPEDS37P	4.37b) Preparing students for work-based or on-site job activities
TSPEDS38P	4.38b) Preparing students for community-based service or volunteer activities

Descriptives

Table 3.77 Vocational Education – Secondary Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
TSPEDS36P	200	.00	87.50	5.9333	.98021	13.86221	3.279	.172	12.284	.342
TSPEDS37P	200	.00	87.50	4.2483	.72910	10.31103	4.610	.172	26.807	.342
TSPEDS38P	200	.00	16.67	.7954	.16801	2.37597	4.525	.172	23.347	.342

3.5.4 Summary

A total of 34 items was retained for the Pedagogical Practices (Primary) and 38 items for the Pedagogical Practices (Secondary) scales. Primary and secondary scales are compared below (refer Table 3.78). While there is consistency between the two, the scales are not necessarily comparable. Classroom practices and curriculum content are likely to be qualitatively different in primary and secondary schools and therefore identically worded items are likely to interpreted differently by primary and secondary teachers and taken to refer to different phenomena.

Table 3.78 Comparison of Primary and Secondary Scales

PRIMARY	SECONDARY
Basic Skills	**Basic Skills**
TSPEDP1 - PedP. Direct instruction basic skills literacy	TSPEDS1 - PedS. Direct instruction basic skills literacy
TSPEDP2 - PedP. Direct instruction basic skills numeracy	TSPEDS2 - PedS. Direct instruction basic skills numeracy
TSPEDP3 - PedP. Worksheets	TSPEDS3 - PedS. Worksheets
TSPEDP4 - PedP. Standardised test preparation	TSPEDS4 - PedS. Standardised test preparation
TSPEDP5 - PedP. Structured curriculum from teacher guidebook	TSPEDS5 - PedS. Structured curriculum from teacher guidebook
TSPEDP26 - PedP. Summarising previous lessons	TSPEDS26 - PedS. Summarising previous lessons
Canonical	**Canonical**
TSPEDP15 - PedP. Traditional Australian/ Western literary	TSPEDS15 - PedS. Traditional Australian/ Western literary
TSPEDP16 - PedP. Key facts/ concepts in KLAs for science	TSPEDS16 - PedS. Key facts/ concepts in KLAs for science
TSPEDP17 - PedP. Key facts/ concepts in KLAs for history	TSPEDS17 - PedS. Key facts/ concepts in KLAs for history
TSPEDP18 - PedP. Knowledge of traditional academic value	TSPEDS18 - PedS. Knowledge of traditional academic value
Community/ Indigenous	**Community/ Indigenous**
TSPEDP9 - PedP. Local Indigenous curriculum	TSPEDS9 - PedS. Local Indigenous curriculum
TSPEDP10 - PedP. Local Indig. Language/ TSI Kriol	TSPEDS10 - PedS. Local Indig. Language/ TSI Kriol
TSPEDP19 - PedS. Traditional Indigenous literary	TSPEDS19 - PedS. Traditional Indigenous literary
TSPEDP20 - PedP. Discussion/ exploration	TSPEDS20 - PedS. Discussion/ exploration

Indig. Identity	Indig. Identity

Progressive	**Progressive**
TSPEDP6 - PedP. Hands on/ learning by doing	TSPEDS6 - PedS. Hands on/ learning by doing
TSPEDP7 - PedP. Play based activities	TSPEDS7 - PedS. Project based activities for high involvement
TSPEDP12 - PedP. Individualised instruction from IEP	TSPEDS12 - PedS. Individualised instruction from IEP
TSPEDP13 - PedP. Independent small group work/ assigned tasks	TSPEDS13 - PedS. Independent small group work/ assigned tasks
TSPEDP14 - PedP. Activities negotiated on basis of student interest	TSPEDS14 - PedS. Activities negotiated on basis of student interest
Critical Literacy	**Critical Literacy**
TSPEDP32 - PedP. Critical analysis underlying messages in text	TSPEDS32 - PedS. Critical analysis underlying messages in text
TSPEDP33 - PedP. Lessons how texts position students as members of society	TSPEDS33 - PedS. Lessons how texts position students as members of society
TSPEDP34 - PedP. Students consider critical perspectives of issues	TSPEDS34 - PedS. Students consider critical perspectives of issues
TSPEDP35 - PedP. Critical discussion of TV shows, movies, art etc.	TSPEDS35 - PedS. Critical discussion of TV shows, movies, art etc.
Assessment	**Assessment**
TSPEDP8 - PedP. Individual/ small group diagnostic tests	TSPEDS8 - PedS. Individual/ small group diagnostic tests
TSPEDP21 - PedP. Test/ quizzes to test student learning	TSPEDS21 - PedS. Test/ quizzes to test student learning
TSPEDP22 - PedP. Written feedback on student work	TSPEDS22 - PedS. Written feedback on student work
TSPEDP23 - PedP. Discuss assessment criteria/ standards	TSPEDS23 - PedS. Discuss assessment criteria/ standards
TSPEDP24 - PedP. Students evaluate each others' work	TSPEDS24 - PedS. Students evaluate each others' work
TSPEDP25 - PedP. Reviewing students' homework	TSPEDS25 - PedS. Reviewing students' homework
TSPEDP30 - PedP. Compare/ moderate student progress with other teachers	TSPEDS30 - PedS. Compare/ moderate student progress with other teachers
TSPEDP31 - PedP. Verbal/ written feedback on student work	TSPEDS31 - PedS. Feedback on student work

Classroom Management	**Classroom Management**
TSPEDP27 - PedP. Managing classroom behaviour	TSPEDS27 - PedS. Managing classroom behaviour
TSPEDP28 - PedP. Discussing classroom rules	TSPEDS28 - PedS. Discussing classroom rules
TSPEDP29 - PedP. Classroom administrative duties	TSPEDS29 - PedS. Classroom administrative duties
N/A	**Vocational Education**
	TSPEDS11 - PedS. Real world knowledge
	TSPEDS36 - PedS. Voc Ed. Modules
	TSPEDS37 - PedS. Preparation for work/ on-site jobs

3.6 Pedagogy and Curriculum Leader Survey

As in the Teacher Survey, pedagogy and curriculum were assembled as a composite category for the Leader Survey. The original items were generated as an overall description of approach to classroom teaching/learning by the research team in consultation with SSLC and SSLP staff, teachers and curriculum experts with experience in Indigenous education. In focus group pilot studies, experienced school leaders commented on the difficulty of technically differentiating pedagogy from curriculum. While they are theoretically distinct elements of the "message system" (Bernstein, 1990) of curriculum, instruction and assessment – principals and schools leaders typically combine them in composite descriptions of approaches to teaching and learning. This is, in the literature on curriculum theory, referred to as the "enacted curriculum" (deCastell, Luke & Luke, 1989).

These items were listed on a 1-9 likert scale. School leaders were asked to provide an overall rating on "to what degree the statements reflect the situation in your school". A principal components analysis (See Appendix 3.3) was undertaken as described below. The categorical descriptions of each composite construct were then developed. They are listed in Table 3.79

Table 3.79 Leader Pedagogy and Curriculum Item Set

Item	Description
LSPED1	8.1. Indigenous students require strong lesson scaffolding and direct instruction.
LSPED2	8.3. Indigenous students require a pre-planned step-by-step approach to learning.
LSPED3	8.4. Practical, hands-on lessons (e.g., vocational and technical tasks) are the most effective strategies for engaging Indigenous students.
LSPED4	8.5. Effective teaching of Indigenous students requires a strong focus on classroom management and rules.
LSPED5	8.6. Indigenous students negotiate their movement and use of space in the classroom (e.g., learning stations, group work).
LSPED6	8.7. A comprehensive, packaged approach to teaching and learning is used for Indigenous students (e.g., Jolly Phonics, Letter Land, Multi Lit, Go Maths).
LSPED7	8.8. There is provision in the curriculum for Indigenous students to learn from community elders.
LSPED8	8.10. Indigenous students are allowed to choose topics and curriculum content in their learning.
LSPED9	8.11. Indigenous students receive individually tailored instruction.
LSPED10	8.12. Indigenous students negotiate their learning tasks (e.g., topics, due dates, criteria).
LSPED11	8.13. Indigenous students often explore issues of identity and their 'voice'.
LSPED12	8.14. The approaches to teaching reflect Indigenous communication styles (e.g., family interaction patterns, ways of addressing elders, behaviour management strategies).
LSPED13	8.15. There is a strong focus for Indigenous learners on real world knowledge (e.g., how to deal with institutions, how to access services, using media).
LSPED14	8.16. Indigenous students require a strong emphasis on the Key Learning Areas to achieve successful learning.
LSPED15	8.17. The core school curriculum strongly focuses on basic skills of literacy.
LSPED16	8.18. The core school curriculum strongly focuses on basic skills of numeracy.
LSPED17	8.19. It is essential that Indigenous students engage with traditional Western literary and historical knowledge (e.g., literary 'classics', Greek and Roman myths).
LSPED18	8.20. It is essential that Indigenous students engage with high status Western mathematical and scientific knowledge (e.g., Physics, Chemistry, Advanced Mathematics).
LSPED19	8.21. It is essential that Indigenous students master spoken and written Standard Australian English.
LSPED20	8.22. The integration of community knowledges and issues into the classroom is prominent.
LSPED21	8.23. There is a strong emphasis on local Indigenous knowledges in the curriculum (e.g., local history, cultural practices, Aboriginal terms and locations).
LSPED22	8.24. There is provision for specialised instruction in elements of Indigenous cultural, artistic and musical expression.

LSPED23	8.25. There is provision for teaching Indigenous languages.
LSPED24	8.26. There is provision for Aboriginal English and Torres Strait Islander Kriol/ Creole to be spoken in classrooms.
LSPED25	8.27. Involvement in workplace and community service is an important part of curriculum for Indigenous students at this school.
LSPED26	8.28. Indigenous students are exposed to career education.
LSPED27	8.29. Exposure to mainstream classics of children's literature is important for Indigenous students (e.g., Roald Dahl, C. S. Lewis, E. B. White).

The rotated component matrix indicates a clear 7-component solution with LSPED1 – LSPED6 loading on component 1(Conventional) and LSPED7, LSPED12 and LSPED20 – LSPED22 loading on component 2 (Progressive). Component 3 (School Subjects) consisted of LSPED14-16 and LSPED27; component 4 (Community/ Indigenous) which consisted of LSPED8-11; and component 5 (Canonical/ Discipline) which consisted of LSPED17-19. The sixth component (Language) consisted of LSPED23-LSPED24, while the seventh component (Vocational) consisted of LSPED13 and LSPED25-26. LSSC5 is cross loading on both factors.

Reliability analysis showed that all components displayed internal consistency at 0.7 or better. Two items (LSPED19 and LSPED13) were found to decrease the reliability of the component however they were not deleted, as they did not decrease the internal consistency below 0.7. The scale reliability findings are summarised in Table 3.80.

Table 3.80 Scale Reliability and PCA Component Loadings

Items/ Components	Component Loading
1. Conventional (α=.879)	
LSPED2 - Pedagogy - Pre-Planned	.833
LSPED1 - Pedagogy - Lesson Scaffold	.759
LSPED3 - Pedagogy - Practical	.740
LSPED6 - Pedagogy - Packaged T&L	.681
LSPED4 - Pedagogy - Classroom Management	.666
LSPED5 - Pedagogy - Movement/ Use of Space	.577
2. Progressive (α=.805)	
LSPED10 - Pedagogy - Negotiate Learning Tasks	.796
LSPED8 - Pedagogy - Choose Topics/ Curriculum	.629
LSPED9 - Pedagogy - Individually Tailored Instruction	.502
LSPED11 - Pedagogy - Exploration of Identity/ Voice	.497
3. School Subjects (α=.864)	
LSPED15 - Pedagogy - Literacy	.849
LSPED16 - Pedagogy - Numeracy	.832
LSPED27 - Pedagogy - Mainstream Child. Classics	.671
LSPED14 - Pedagogy - KLA	.535
4. Community (α=.885)	
LSPED22 - Pedagogy - Special. Inst. Culture/ Arts	.852
LSPED7 - Pedagogy - Learn from Community Elders	.714
LSPED21 - Pedagogy - local Indig. Know.	.708
LSPED12 - Pedagogy - Indig. Communication Styles	.541
LSPED20 - Pedagogy - Community Know./ Issues	.527

5. Canonical/ Discipline (α=.721)	
LSPED17 - Pedagogy - Trad. Western Lit./ Hist.	.887
LSPED18 - Pedagogy - Trad. Western Math./ Science	.817
LSPED19 - Pedagogy - Standard AU English	.504
6. Language (α=.709)	
LSPED24 - Pedagogy - Speak Indig. Languages	.794
LSPED23 - Pedagogy - Teach Indig. Languages	.725
7. Vocational (α=.743)	
LSPED13 - Pedagogy - Real World Knowledge	.386
LSPED26 - Pedagogy - Career Education	.927
LSPED25 - Pedagogy - Work/ Community Service	.884

Each category was contextualised as follows:

Conventional: This cluster refers to scaffolded and structured teaching that is planned, step-by-step, in a well-managed, directive classroom environment. It ranges from packaged, structured curriculum to hands-on work.

Progressive: This cluster refers to negotiated, student-centred work that focuses on individually tailored instruction where students can negotiate content and learning tasks, with an emphasis on the exploration of individual and Indigenous 'voice'.

School Subjects: This cluster refers to foci on school subjects of literacy, numeracy and other designated key learning areas.

Community: This cluster refers to a focus on Indigenous knowledge, culture, arts and history as core elements of curriculum and instruction.

Canonical/Discipline: This cluster refers to traditional, mainstream foci on the canon of Western literature, history, science and Standard English as core elements of curriculum and instruction.

Language: This cluster refers to the classroom use of Aboriginal and Torres Strait Islander vernacular languages, Creoles/Kriols and non-standard dialects as media of instruction and as specific objects of instruction.

Vocational: This cluster refers to a focus on real world knowledge, pathway articulation to vocational education and work.

3.7 Comparative Analysis: Pedagogy Teacher Survey

3.7.1 Introduction

The foundational premise that involvement in the SSLC/SSLP program will act as a causal agent in operationalising Stronger Smarter messages was tested via a three-stage process.

The first stage involved identifying the latent constructs that mapped to the SSLC tenets. This was done through review of the research literature supported by consultation with stakeholders such as SSI members, Indigenous Reference Group, International Reference Group, teachers and leaders in Indigenous education.

The second stage involved an extensive analysis of the items proposed to plumb the constructs identified. Measurement models were then constructed and validated along with indexes to quantify the construct.

The third stage involves a comparative study where SSLC membership of a school is treated as an intervention and comparisons made with non- SSLC similar schools. The comparisons are across the constructs identified and plumb teachers' view of their school. The null hypothesis could be stated as *"there is no difference in the way teachers who are sited in an SSLC school and teachers who are not sited in an SSLC school view the level of the construct of interest within their school"*. It is important to note that the comparison is not at the school level but at the SSLC membership level.

3.7.2 The Process

Error bar graphs and box plots were initially constructed as a visual aid to qualifying possible differences across groups and to check on underlying distributions. Independent sample T-tests were used to test for statistically significant differences ($p<0.05$) within constructs across teachers who were members of an SSLC school (hub or affiliate) and those teachers who were not members of an SSLC school. Effect sizes were calculated for all comparisons irrespective of whether statistical significance was reached or not. Effect sizes were calculated using a pooled variance approach to take into account unequal group sizes. A factorial Analysis of Covariance (ANCOVA) model was used to investigate possible confounding variables for influence on the level of the construct as well as any possible interaction effects. Variables considered to possibly confound and/or interact included percentage of Indigenous students in the school, type of school (primary or secondary), Socio-economic indicator for the school (ISCEA) and location (remote/very remote, provincial and metropolitan).

3.7.3 Results

The results of the comparisons are given in Table 3.81.

Table 3.81 Comparison of SSLC and non-SSLC on Teacher Rated Pedagogy

Construct	Mean (SD) SSLC	Mean (SD) non-SSLC	t-value	P	Effect size
Basic Skills Primary	60.18 (95.60)	44.71 (38.79)	.691	.491	*d*= .212
Canonical Primary	31.26 (133.83)	19.80 (25.48)	.370	.712	*d*= .119
Community Indigenous Primary	14.01 (43.86)	5.75 (11.87)	.812	.419	*d*= .257
Progressive Primary	54.34 (107.09)	37.79 (27.22)	.667	.506	*d*= .212
Critical Literacy Primary	16.96 (30.87)	11.95 (11.84)	.694	.489	*d*= .214
Assessment Primary	35.94 (93.08)	32.79 (31.00)	.145	.885	*d*= .045
Classroom Management Primary	22.43 (36.46)	26.11 (21.27)	-.424	.673	*d*= .123
Basic Skills Secondary	38.72 (184.28)	29.02 (31.19)	.427	.669	*d*= .073
Canonical Secondary	14.46 (22.53)	14.82 (19.04)	-.114	.910	*d*= .017
Community Indigenous Secondary	4.79 (10.82)	2.76 (7.53)	1.541	.125	*d*= .217
Progressive Secondary	50.51 (157.26)	40.02 (45.38)	.534	.594	*d*= .091
Critical Literacy Secondary	8.22 (15.03)	14.25 (20.98)	-2.099	.038*	*d*= .331
Assessment Secondary	22.19 (24.65)	26.88 (22.70)	-1.305	.193	*d*= .198
Classroom Management Secondary	11.84 (14.43)	17.40 (23.07)	-2.087	.038*	*d*= .289
Vocational Education Secondary	15.84 (26.22)	18.90 (39.06)	-.655	.513	*d*= .092

- Significant at the 0.05 level

Finding 30: There were no differences in reported pedagogy/curriculum practices between SSLC and non-SSLC schools, except higher levels of critical literacy in non-SSLC secondary schools.

Basic Skills (Primary)

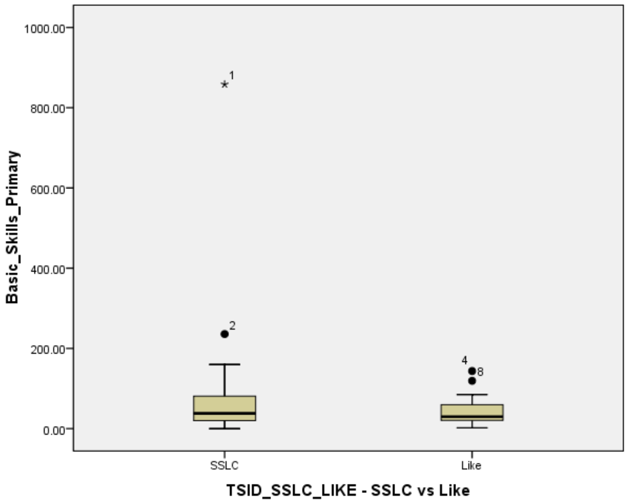


Figure 3.64 Basic Skills (Primary) Box Plot

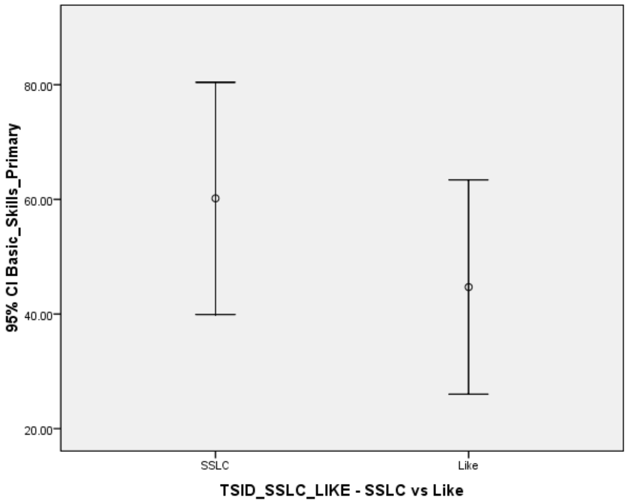


Figure 3.65 Basic Skills (Primary) 95% Error Bar Chart

Both the box plot (Figure 3.64) and 95% confidence limit plot (Figure 3.65) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have higher levels on the category.

On average teachers exposed to an SSLC environment reported higher levels of Basic Skills (M=60.18, SD=95.60) in their schools compared to those teachers not exposed to an SSLC environment (M=44.71, SD=38.79). This difference was not statistically significant t (105) =.691, p>0.05; further this difference represented a small effect size d=0.21.

Canonical (Primary)

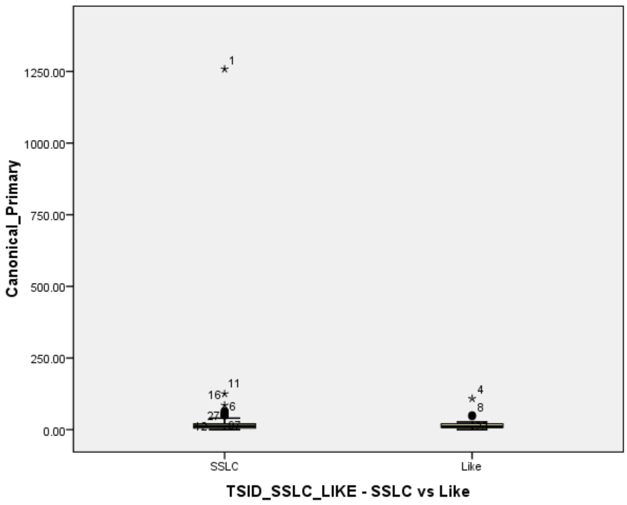


Figure 3.66 Canonical (Primary) Box Plot

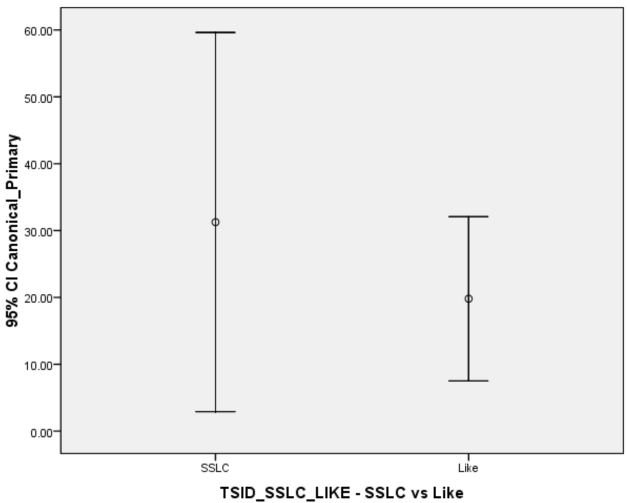


Figure 3.67 Canonical (Primary) 95% Error Bar Chart

Both the box plot (Figure 3.66) and 95% confidence limit plot (Figure 3.67) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have higher levels on the category.

On average teachers exposed to an SSLC environment reported higher levels on the Canonical category (M=31.26, SD=133.83) in their schools compared to those teachers not exposed to an SSLC environment (M=19.80, SD=25.48). This difference was not statistically significant t (105) =.370, p>0.05; further this difference represented a small effect size d=0.12.

Community/ Indigenous (Primary)

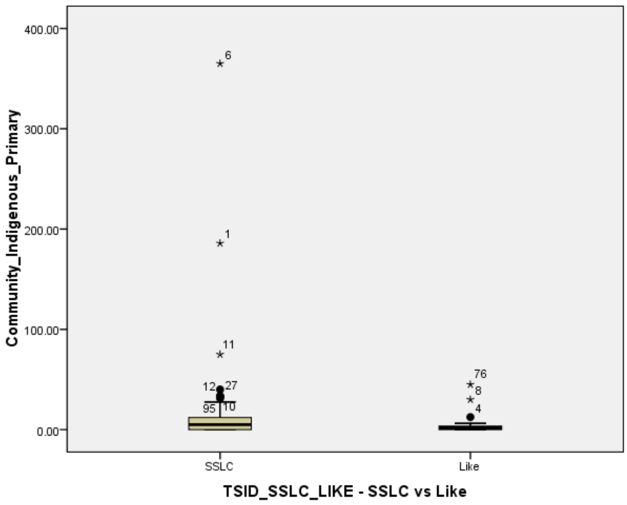


Figure 3.68 Community/Indigenous (Primary) Box Plot

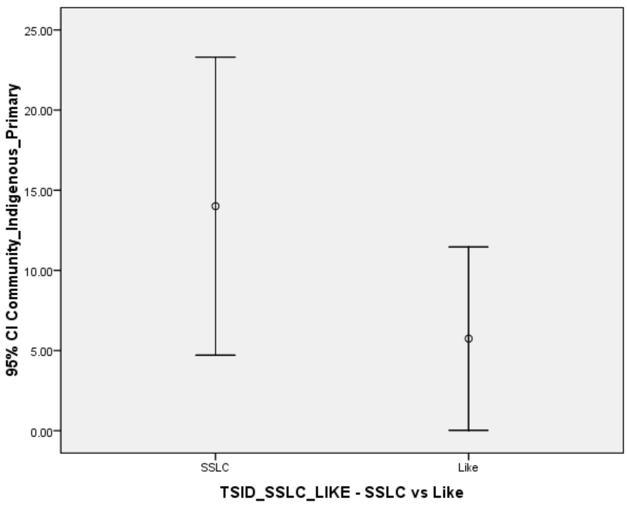


Figure 3.69 Community/Indigenous (Primary) 95% Error Bar Chart

Both the box plot (Figure 3.68) and 95% confidence limit plot (Figure 3.69) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have higher levels on the category.

On average teachers exposed to an SSLC environment reported higher levels on the Community/ Indigenous category (M=14.01, SD=43.86) in their schools compared to those teachers not exposed to an SSLC environment (M=5.75, SD=11.87). This difference was not statistically significant t (105) =.812, p>0.05; further this difference represented a small effect size d=0.26.

Progressive (Primary)

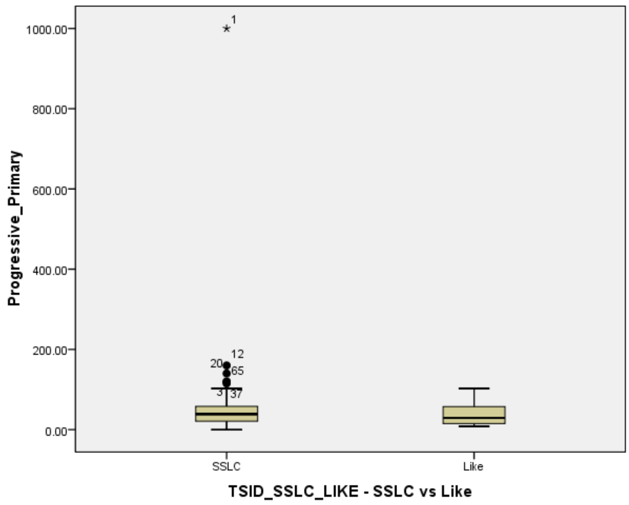


Figure 3.70 Progressive (Primary) Box Plot

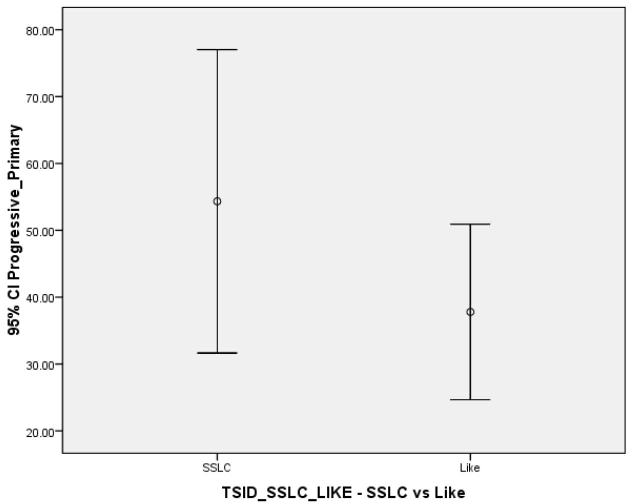


Figure 3.71 Progressive (Primary) 95% error Bar Chart

Both the box plot (Figure 3.70) and 95% confidence limit plot (Figure 3.71) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have higher levels on the category.

On average teachers exposed to an SSLC environment reported higher levels on the Progressive category (M=54.34, SD=107.09) in their schools compared to those teachers not exposed to an SSLC environment (M=37.79, SD=27.22). This difference was not statistically significant t (105) =.667, p>0.05; further this difference represented a small effect size d=0.21.

Critical Literacy (Primary)

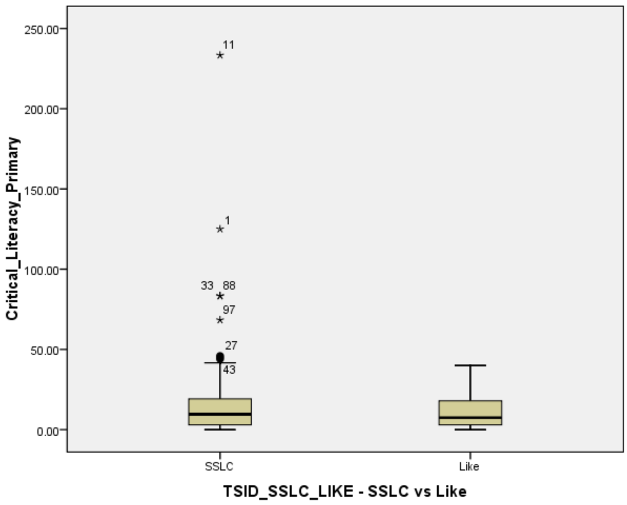


Figure 3.72 Critical Literacy (Primary) Box Plot

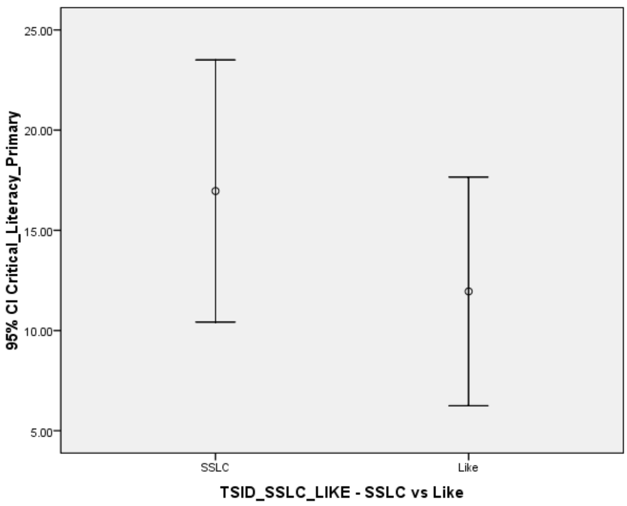


Figure 3.73 Critical Literacy (Primary) 95% Error Bar Chart

Both the box plot (Figure 3.72) and 95% confidence limit plot (Figure 3.73) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have higher levels on the category.

On average teachers exposed to an SSLC environment reported higher levels of Critical Literacy (M=16.96, SD=30.87) in their schools compared to those teachers not exposed to an SSLC environment (M=11.95, SD=11.84). This difference was not statistically significant t (105) =.694, p>0.05; further this difference represented a small effect size d=0.21.

Assessment (Primary)

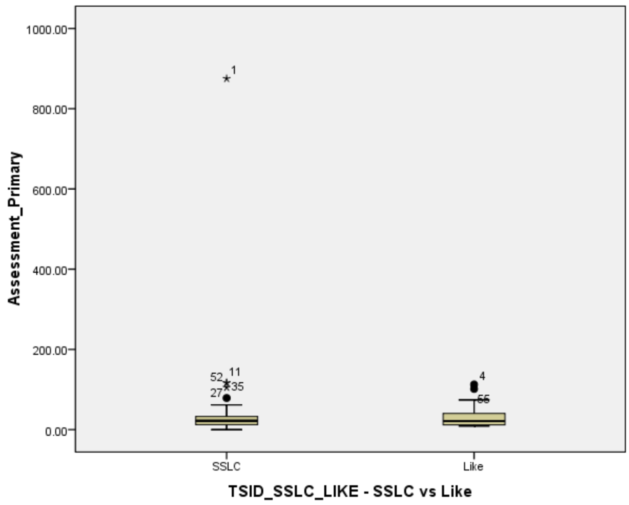


Figure 3.74 Assessment (Primary) Box Plot

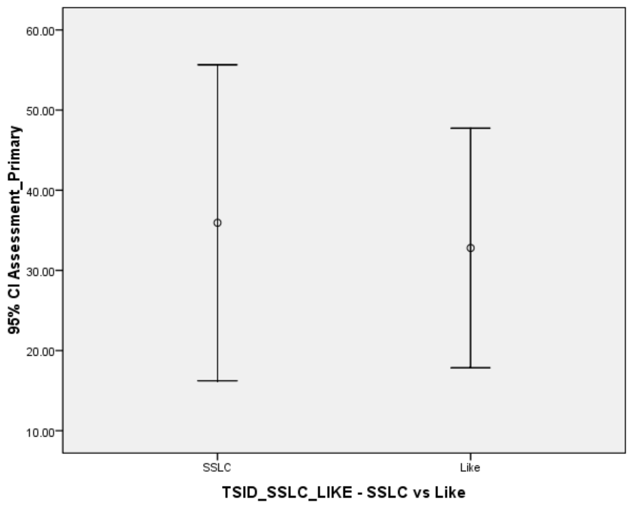


Figure 3.75 Assessment (Primary) 95% Error Bar Chart

Both the box plot (Figure 3.74) and 95% confidence limit plot (Figure 3.75) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have higher levels on the category.

On average teachers exposed to an SSLC environment reported higher levels of Assessment (M=35.94, SD=93.08) in their schools compared to those teachers not exposed to an SSLC environment (M=32.79, SD=31.00). This difference was not statistically significant t (105) =.145, p>0.05; further this difference represented a small effect size d=0.045.

Classroom Management (Primary)

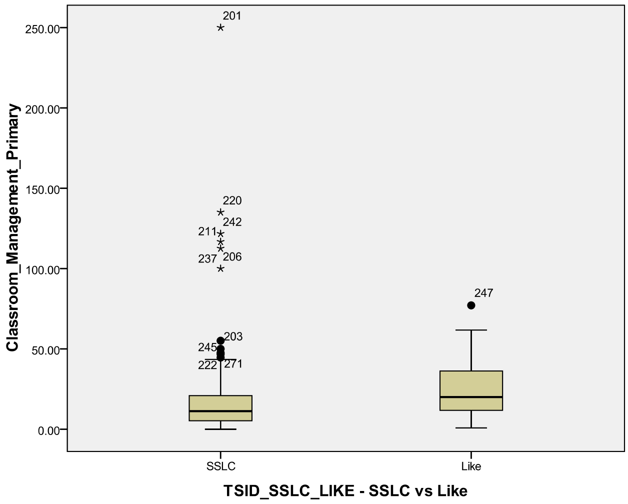


Figure 3.76 Classroom Management (Primary) Box Plot

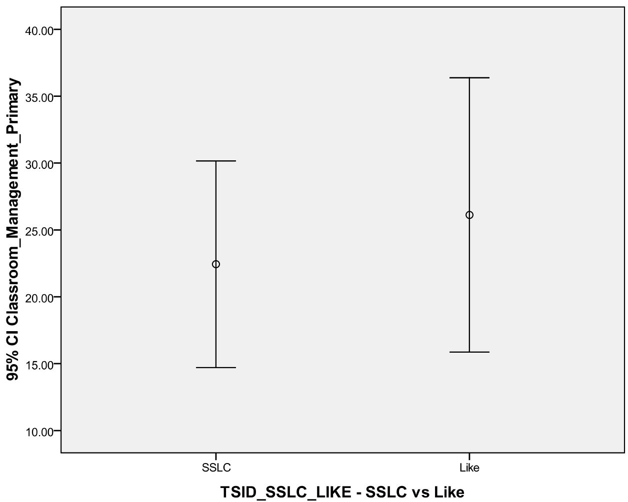


Figure 3.77 Classroom Management (Primary) 95% Error Bar Chart

Both the box plot (Figure 3.76) and 95% confidence limit plot (Figure 3.77) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have lower levels on the category.

On average teachers exposed to an SSLC environment reported lower levels of Classroom Management (M=22.43, SD=36.46) in their schools compared to those teachers not exposed to an SSLC environment (M=26.11, SD=21.27). This difference was not statistically significant t (105) =-.424, p>0.05; further this difference represented a small effect size d=0.12.

Basic Skills (Secondary)

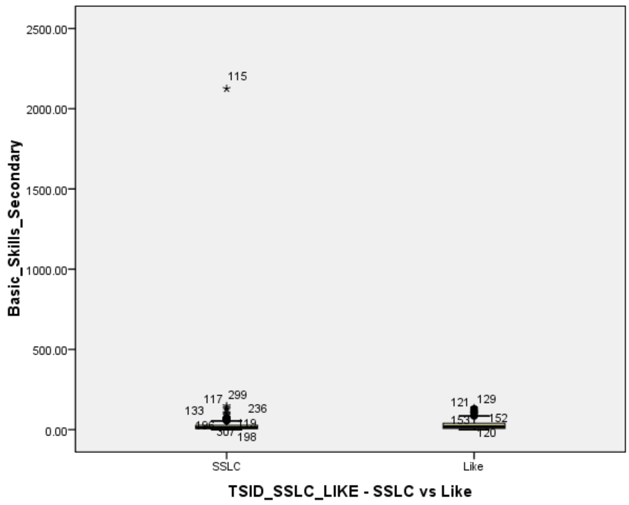


Figure 3.78 Basic Skills (Secondary) Box Plot

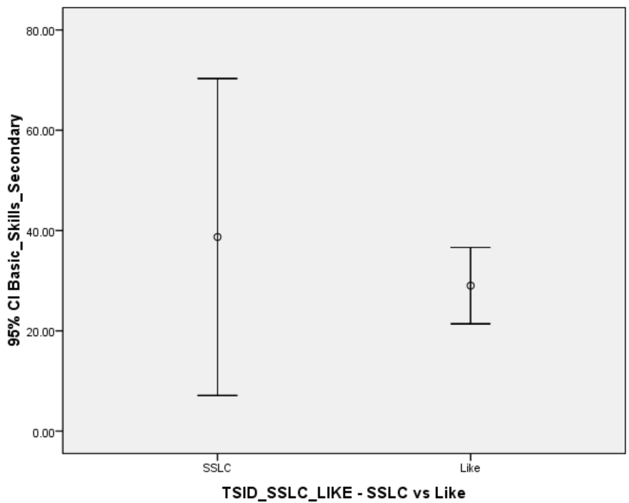


Figure 3.79 Basic Skills (Secondary) 95% Error Bar Chart

Both the box plot (Figure 3.78) and 95% confidence limit plot (Figure 3.79) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have higher levels on the category.

On average teachers exposed to an SSLC environment reported higher levels of Basic Skills (M=38.72, SD=184.28) in their schools compared to those teachers not exposed to an SSLC environment (M=29.02, SD=31.19). This difference was not statistically significant *t* (198) =.427, *p*>0.05; further this difference represented a small effect size *d*=0.073.

Canonical (Secondary)

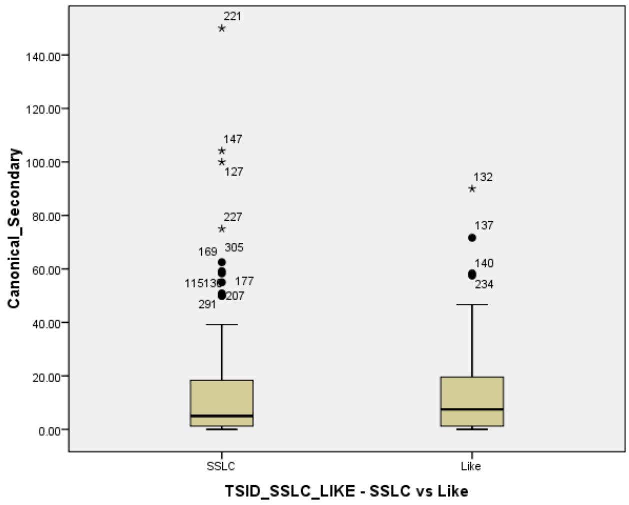


Figure 3.80 Canonical (Secondary) Box Plot

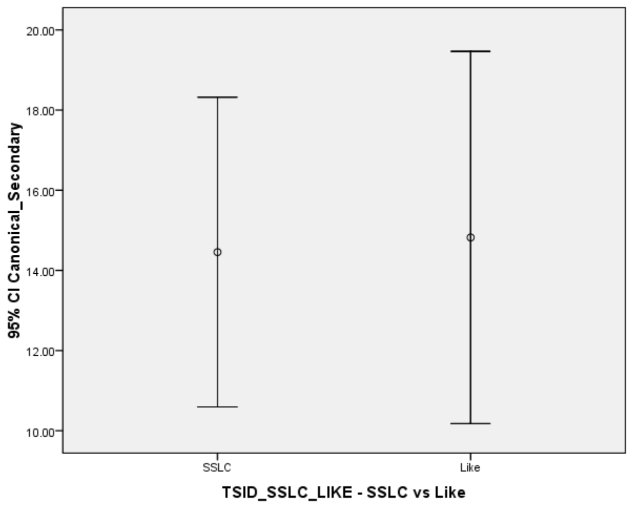


Figure 3.81 Canonical (Secondary) 95% Error Bar Chart

Both the box plot (Figure 3.80) and 95% confidence limit plot (Figure 3.81) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have similar levels on the category.

On average teachers exposed to an SSLC environment reported similar levels on the Canonical category (M=14.46, SD=22.53) in their schools to those teachers not exposed to an SSLC environment (M=14.82, SD=19.04). This difference was not statistically significant t (198) =-.114, p>0.05; further this difference represented a small effect size d=0.017.

Community/ Indigenous (Secondary)

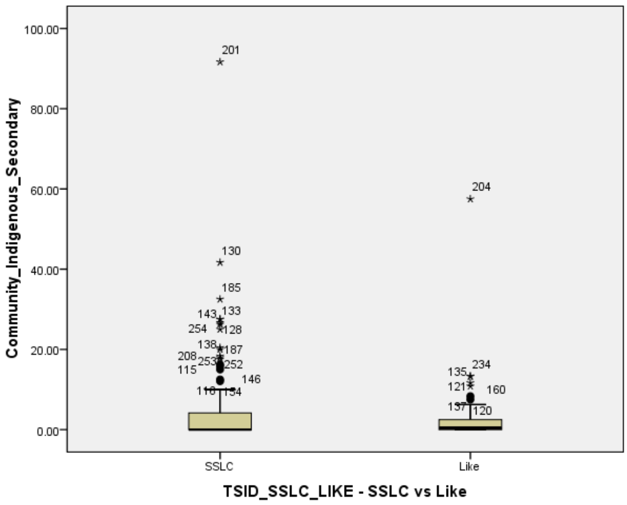


Figure 3.82 Community/Indigenous (Secondary) Box Plot

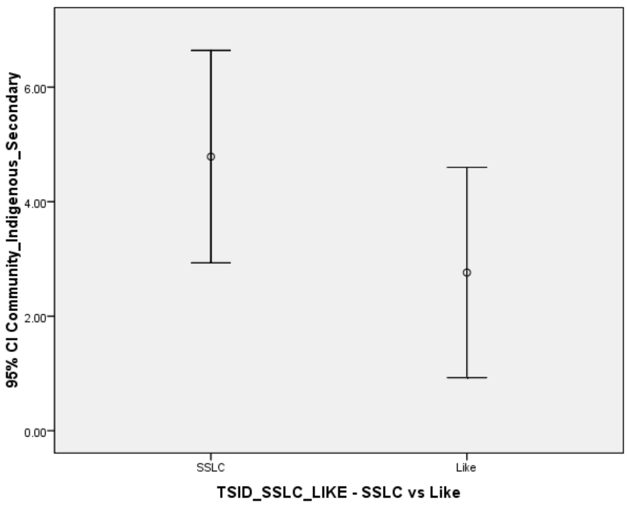


Figure 3.83 Community/Indigenous (Secondary) 95% Error Bar Chart

Both the box plot (Figure 3.82) and 95% confidence limit plot (Figure 3.83) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have higher levels on the category.

On average teachers exposed to an SSLC environment reported higher levels on the Community/ Indigenous category (M=4.79, S=10.82) in their schools compared to those teachers not exposed to an SSLC environment (M=2.76, SD=7.53). This difference was not statistically significant t (178.247) =1.541, p>0.05; further this difference represented a small effect size d=0.22.

Progressive (Secondary)

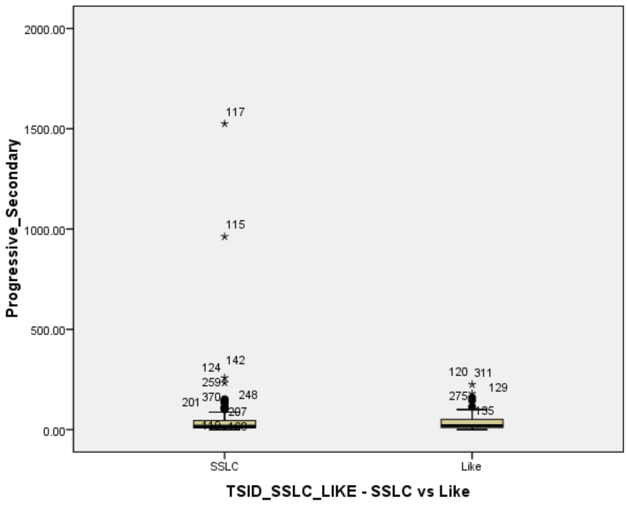


Figure 3.84 Progressive (Secondary) Box Plot

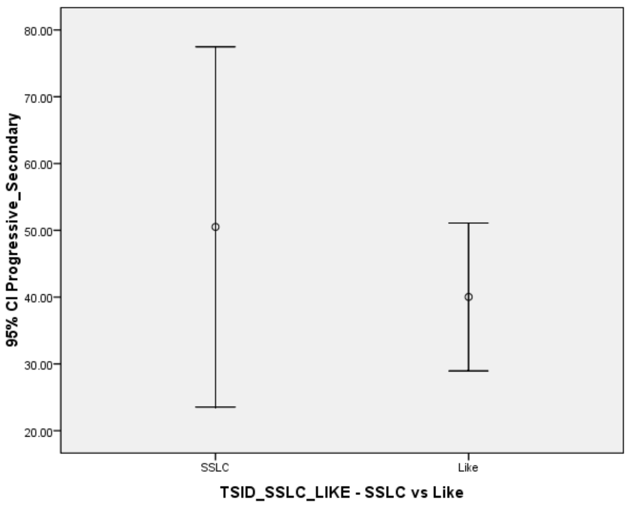


Figure 3.85 Progressive (Secondary) 95% Error Bar Chart

Both the box plot (Figure 3.84) and 95% confidence limit plot (Figure 3.85) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have higher levels on the category.

On average teachers exposed to an SSLC environment reported higher levels on the Progressive category (M=50.51, SD=157.26) in their schools compared to those teachers not exposed to an SSLC environment (M=40.02, SD=45.38). This difference was not statistically significant t (198) =.534, p>0.05; further this difference represented a small effect size d=0.091.

Critical Literacy (Secondary)

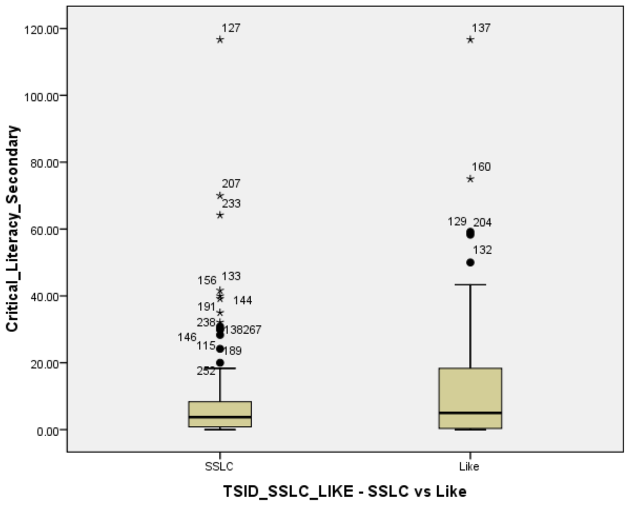


Figure 3.86 Critical Literacy (Secondary) Box Plot

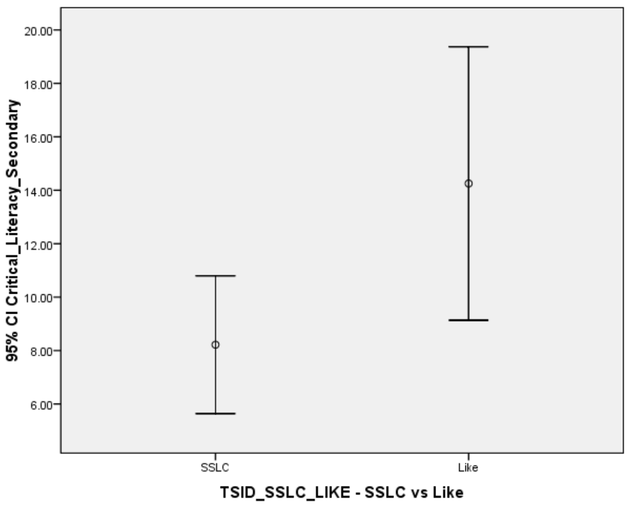


Figure 3.87 Critical Literacy (Secondary) 95 % Error Bar Chart

Both the box plot (Figure 3.86) and 95% confidence limit plot (Figure 3.87) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have lower levels on the category.

On average teachers exposed to an SSLC environment reported lower levels of Critical Literacy (M=8.22, SD=15.03) in their schools compared to those teachers not exposed to an SSLC environment (M=14.25, SD=20.98). This difference was statistically significant t (178) =-2.099, p<0.05; further this difference represented a small effect size d=0.33.

Finding 31: Non-SSLC secondary teachers reported higher levels of critical literacy than SSLC secondary teachers.

Assessment (Secondary)

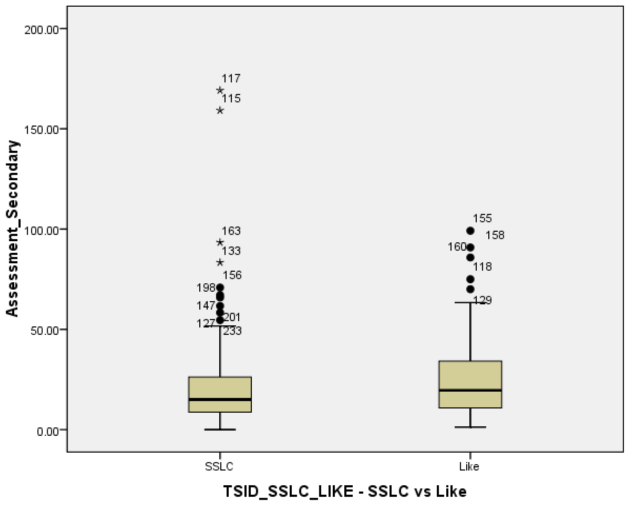


Figure 3.88 **Assessment (Secondary) Box Plot**

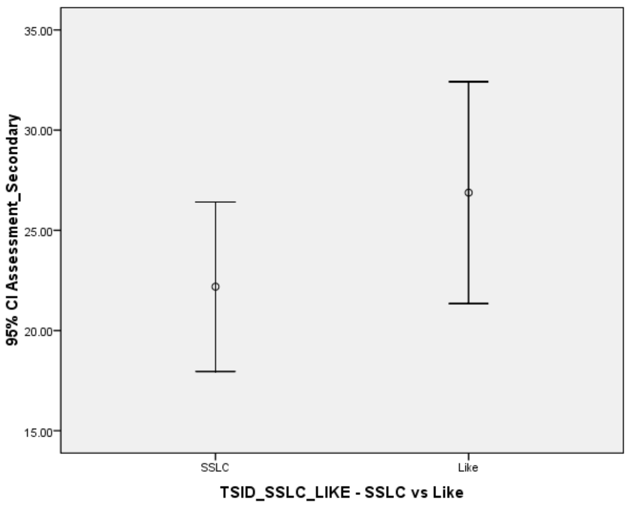


Figure 3.89 **Assessment (Secondary) 95% Error Bar Chart**

Both the box plot (Figure 3.88) and 95% confidence limit plot (Figure 3.89) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have lower levels on the category.

On average teachers exposed to an SSLC environment reported lower levels of Assessment (M=22.19, SD=24.65) in their schools compared to those teachers not exposed to an SSLC environment (M=26.88, SD=22.70). This difference was not statistically significant t (198) =-1.305, p>0.05; further this difference represented a small effect size d=0.20.

Classroom Management (Secondary)

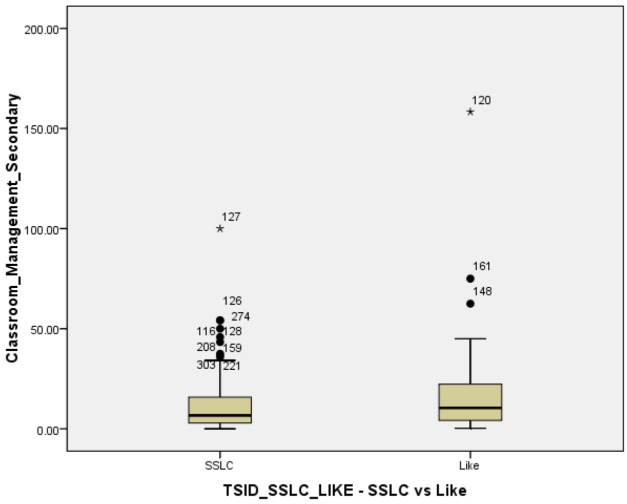


Figure 3.90 Classroom Management (Secondary) Box Plot

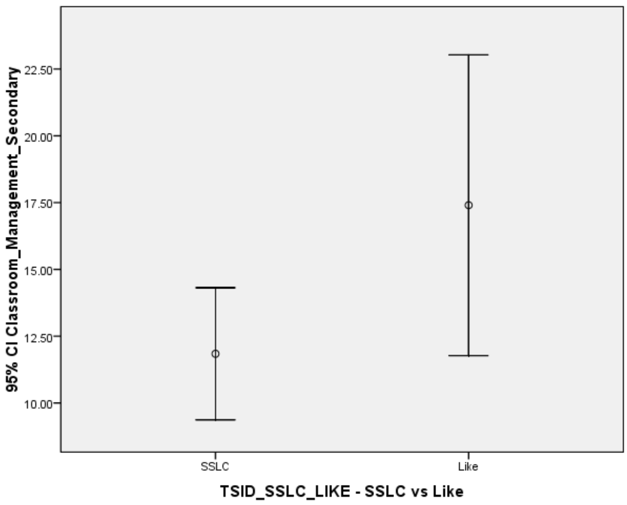


Figure 3.91 Classroom Management (Secondary) 95 % Error Bar Chart

Both the box plot (Figure 3.90) and 95% confidence limit plot (Figure 3.91) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have lower levels on the category.

On average teachers exposed to an SSLC environment reported lower levels of Classroom Management (M=11.84, SD=14.43) in their schools compared to those teachers not exposed to an SSLC environment (M=17.40, SD=23.07). This difference was statistically significant t (198) =-2.087, p<0.05; further this difference represented a small effect size d=0.29.

Finding 32: Non-SSLC secondary teachers reported higher levels of focus on classroom management than SSLC secondary teachers.

Vocational (Secondary)

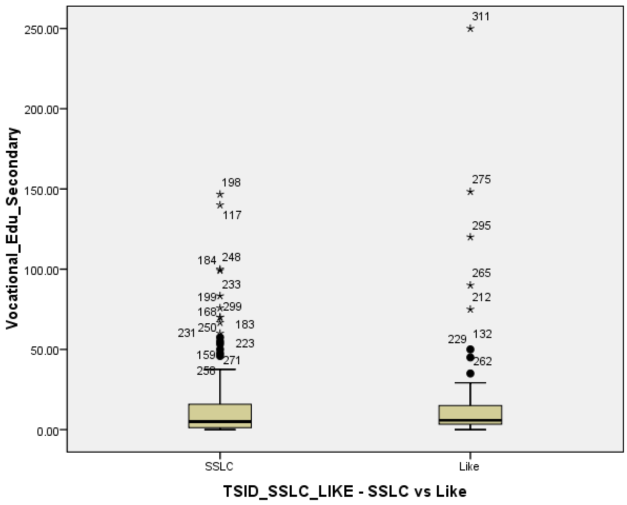


Figure 3.92 Vocational (Secondary) Box Plot

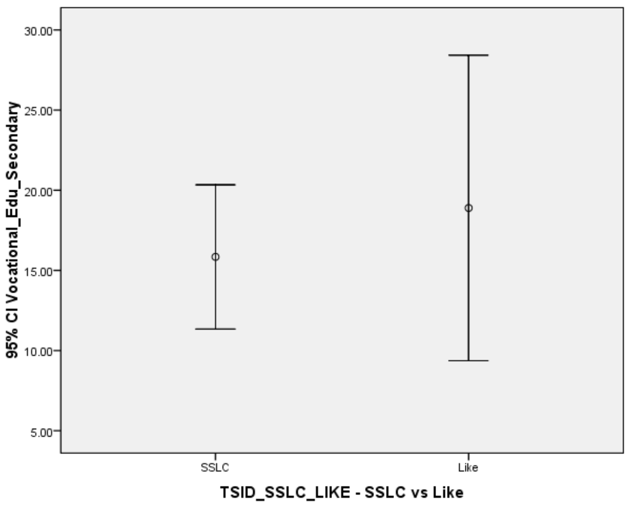


Figure 3.93 Vocational (Secondary) 95% Error Bar Chart

Both the box plot (Figure 3.92) and 95% confidence limit plot (Figure 3.93) would indicate that there is little chance of a statistically significant difference on the level of the construct between SSLC and non-SSLC schools however the SSLC schools tend to have lower levels on the category.

On average teachers exposed to an SSLC environment reported lower levels of Vocational Education (M=15.84, SD=26.22) in their schools compared to those teachers not exposed to an SSLC environment (M=18.90, SD=39.06). This difference was not statistically significant t (198) =-.655, p>0.05; further this difference represented a small effect size d=0.092.

3.7.4 Analysis of Covariance (ANCOVA)

To plumb the possible effect of other determiners on the level of the category and to adjust for possible confounding effects a factorial ANCOVA was also employed. The model consisted of the construct as the dependent variable with the categorical variables SSLC exposure (yes, no), and location (metropolitan, provincial, remote/very remote) being entered as fixed factors. The continuous variablepercentage of Indigenous students enrolled was entered as a covariate. Interaction effects were also plumbed across the fixed factors.

The ANCOVA models were consistent with the results of the independent sample *t*-tests with the following comments.

Primary: The SSLC/ non-SSLC effects were not statistically significant. Percentage of Indigenous students had a significant effect on Community/ Indigenous (p<.05; partial η^2=.08), and Classroom Management (p<*.05*; partial η^2=.04).

Finding 33: Percentage of Indigenous students had a significant impact on community/Indigenous, and classroom management.

Secondary: Percentage of Indigenous students was trending towards significance on Community/ Indigenous (p=.062; partial η^2=.02), as was location; metro (M=3.03), non-metro (M=6.68) (p=.078; partial η^2=.02). Location was trending towards significance on Progressive; metro (M=38.32), non-metro (M=67.73) (p=.085; partial η^2=.02).

3.8 Comparative Analysis: Pedagogy Components Leadership Survey

3.8.1 Introduction

The foundational premise that involvement in the SSLC/SSLP program will act as a causal agent in operationalising Stronger Smarter messages was tested via a three-stage process.

The first stage involved identifying the components that represented pedagogy and curriculum in SSLC and non-SSLC Schools. This was done through review of the research literature supported by consultation with stakeholders such as SSI members, IERG, IRG, teachers and leaders in Indigenous education.

The second stage involved an extensive analysis of the items proposed to plumb the components identified. A principal components analysis was undertaken to construct the scales, which were validated along with indexes to quantify the component.

The third stage involves a comparative study where SSLC membership of a school is treated as an intervention and comparisons made with non- SSLC similar schools. The comparisons are across the pedagogy components identified and plumb leaders' view of their school. The null hypothesis could be stated as *"there is no difference in the way leaders who are sited in an SSLC school and leaders who are not sited in an SSLC school view the pedagogy components of interest within their school"*. It is important to note that the comparison is not at the school level but at the SSLC membership level.

3.8.2 The Process

Error bar graphs and box plots were initially constructed as a visual aid to qualifying possible differences across groups and to check on underlying distributions. Independent sample *t*-tests were used to test for statistically significant differences (p<0.05) within constructs across leaders who were members of an SSLC school (hub or affiliate) and those leaders who were not members of an SSLC school. Effect sizes were calculated for all comparisons irrespective of whether statistical significance was reached or not. Effect sizes were calculated using a pooled variance approach to take into account unequal group sizes. A factorial Analysis of Covariance (ANCOVA) model was used to investigate possible confounding variables for influence on the level of the construct as well as any possible interaction effects. Variables considered to possibly confound and/or interact included percentage of Indigenous students in the school, type of school (primary or secondary), and location (remote/very remote, provincial and metropolitan).

3.8.3 Results

The results of the comparisons are given in Table 3.82.

Table 3.82 Comparison of SSLC and non-SSLC on Leader Pedagogy Indexes

Construct	Mean (SD) SSLC	Mean (SD) non SSLC	t-value	p	Effect size
Conventional	5.21 (1.71)	5.02 (2.08)	0.422	0.674	0.10
Progressive	3.80 (1.55)	3.63 (2.00)	0.407	0.685	0.10
Community/ Indigenous	4.81 (1.77)	3.96 (2.07)	1.822	0.073	0.44
School Subjects	6.52 (1.31)	5.96 (2.25)	1.135	0.265	0.30
Canonical/ Discipline	5.26 (1.68)	4.65 (2.35)	1.145	0.260	0.30
Language	2.49 (2.42)	1.94 (1.76)	0.985	0.328	0.26
Vocational	4.83 (2.15)	3.11 (1.78)	3.401	0.001*	0.87

N = 44-46 SSLC leaders, 24-25 non-SSLC leaders
* Significant at the 0.05 level

Finding 34: There were no differences between SSLC and non-SSLC leaders' reports on pedagogical approaches, except in the areas of vocational education, with trending differences in community/ Indigenous.

Finding 35: The overall mean on language was low in both SSLC and non-SSLC schools, indicating that the use and teaching of Indigenous languages creoles/kriols and dialects was not strongly emphasised in principals' self-reports of pedagogy and curriculum.

Pedagogy: Conventional

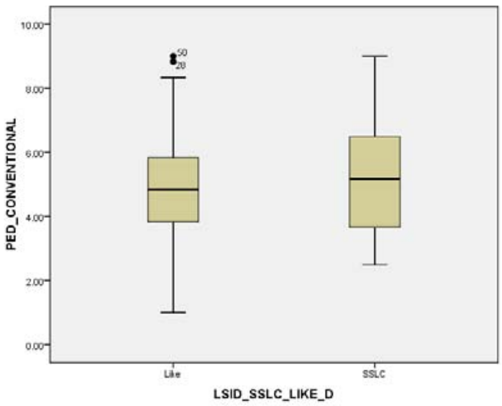


Figure 3.94 Pedagogy: Conventional Box Plot

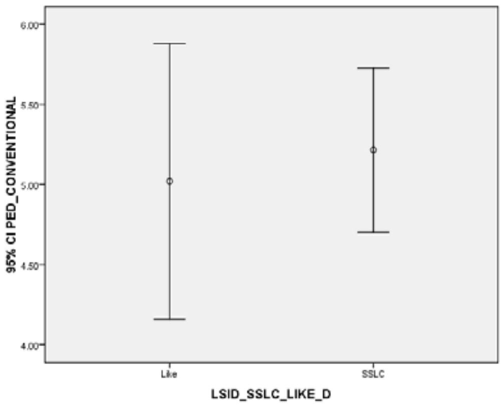


Figure 3.95 Pedagogy: Conventional 95% Error Bar Chart

The box plot (Figure 3.94) and 95% Error Bar Chart (Figure 3.95) indicate a similar level between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence, although the distribution differs. Specifically, the median values of SSLC and non-SSLC schools are almost the same, however SSLC schools indicate a tighter distribution around the mean.

On average, leaders exposed to an SSLC environment reported slightly higher levels of Pedagogy: Conventional (M=5.21, SD 1.71) in their schools compared to those leaders not exposed to an SSLC environment (M=5.02, SD=2.08). However, this difference was not statistically significant *t* (68) =0.422, *p*>0.05; and represented a small effect size *d*=0.10. Findings from the ANCOVA analysis suggested that school level and location impacted leaders' perceptions of conventional pedagogy strategies in their schools.

Pedagogy: Progressive

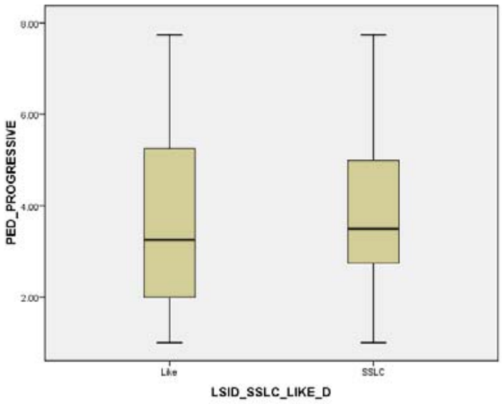


Figure 3.96 Pedagogy: Progressive Box Plot

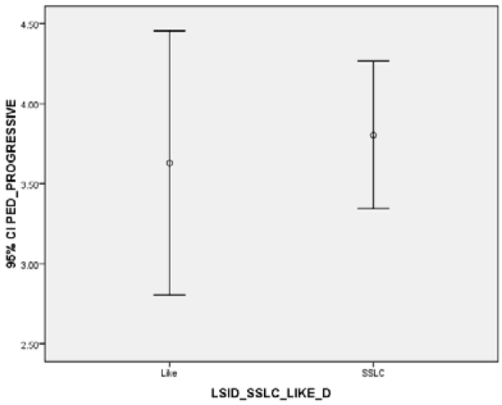


Figure 3.97 Pedagogy: Progressive 95% Error Bar Chart

The box plot (Figure 3.96) and the 95% error bar chart (Figure 3.97) indicate an overlap between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence, although the distribution differs. Of note, SSLC schools indicate a tighter distribution around the mean than non-SSLC schools.

On average leaders exposed to an SSLC environment reported higher levels of Pedagogy: Progressive (M=3.80, SD=1.55) in their schools compared to those leaders not exposed to an SSLC environment (M=3.63, SD=2.00). However, this difference was not statistically significant *t* (69) =0.407, *p*>0.05; and represented a small effect size *d*=0.10. Location, percentage of Indigenous students and school level were found to influence leader perceptions of progressive pedagogy strategies in the ANCOVA.

Pedagogy: Community/ Indigenous

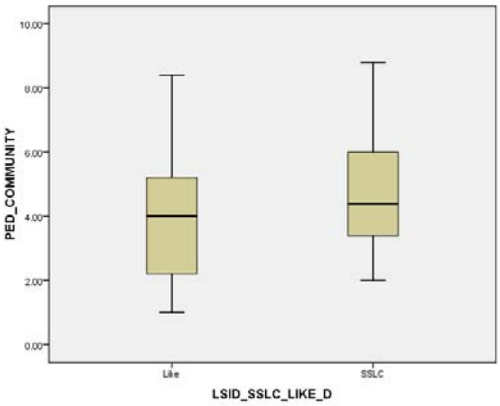


Figure 3.98 **Pedagogy: Community/Indigenous Box Pot**

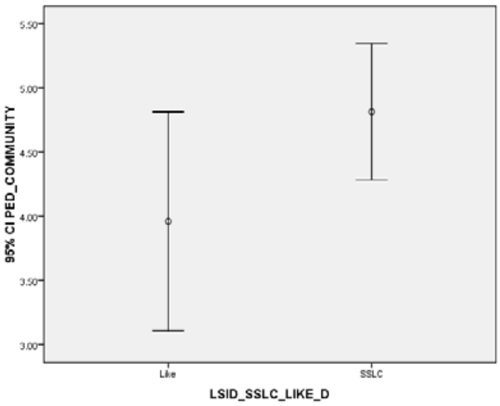


Figure 3.99 **Pedagogy: Community/Indigenous 95% Error Bar Chart**

The box plot (Figure 3.98) and the 95% error bar chart (Figure 3.99) indicate a slight difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Approximately 60% of the SSLC schools are above the median value of the non-SSLC schools with a tighter distribution around the mean.

On average leaders exposed to an SSLC environment reported higher levels of Pedagogy: Community by almost a point (M=4.81, SD=1.77) in their schools compared to those leaders not exposed to an SSLC environment (M=3.96, SD=2.07). This difference was trending towards significance t (68) =1.822, p>0.05; the effect size approached medium d=0.44.

Pedagogy: School Subjects

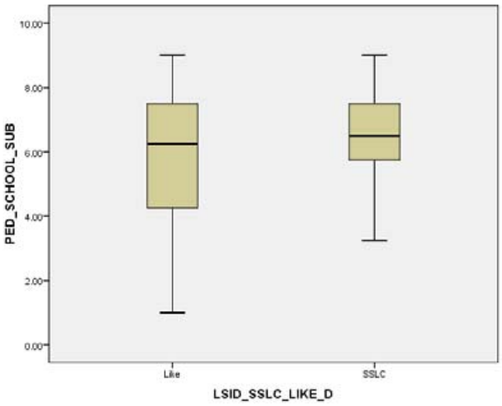


Figure 3.100 Pedagogy: School Subjects Box Plot

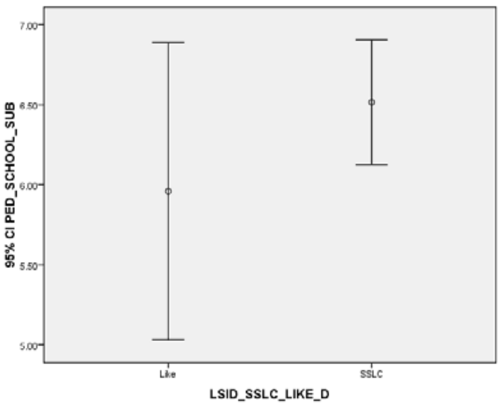


Figure 3.101 Pedagogy; School Subjects 95% Error Bar Charts

The medians for SSLC and non-SSLC schools are almost identical, while the distribution for SSLC schools is closer to the mean than for non-SSLC schools. In addition, 95% of responses from SSLC school leaders are above the mean reported for non SSLC s school principals. (see Figures 3.100 and 3.101).

On average leaders exposed to an SSLC environment reported higher levels of Pedagogy: School Subjects by just over half a point (M=6.52, SD=1.31) in their schools compared to those leaders not exposed to an SSLC environment (M=5.96, SD=2.25). However, this difference was not statistically significant t (33.097) =1.135, p>0.05; and represented a small effect size d=0.30.

Pedagogy: Canonical/ Discipline

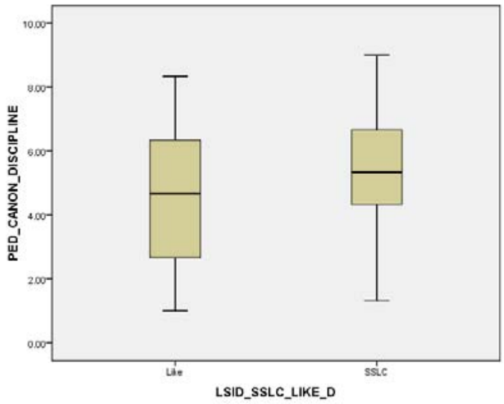


Figure 3.102 Pedagogy: Canonical/Discipline Box Plot

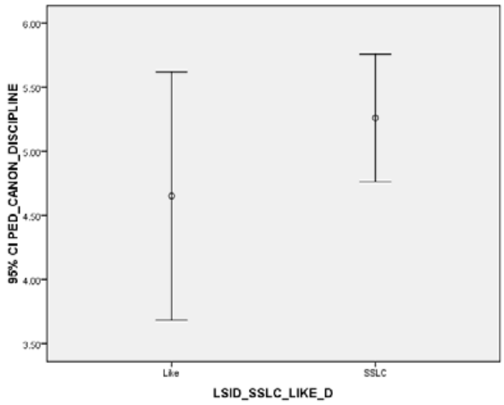


Figure 3.103 Pedagogy: Canonical/Discipline 95% Error Bar Chart

The box plot(Figure 3.103) and the 95% error bar chart (Figure 3.103) indicate a slight difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Approximately 70% of the SSLC schools are above the median value of the non-SSLC schools with a tighter distribution around the mean.

On average leaders exposed to an SSLC environment reported higher levels of Pedagogy: Canonical/ Discipline by over half a point (M=5.26, SD=1.68) in their schools compared to those leaders not exposed to an SSLC environment (M=4.65, SD=2.35). However, this difference was not statistically significant t (37.619) =1.145, p>0.05; and represented a small effect size d=0.30.

Pedagogy: Language

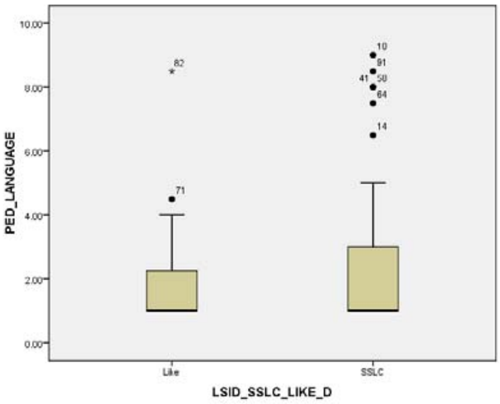


Figure 3.104 Pedagogy: Language Box Plot

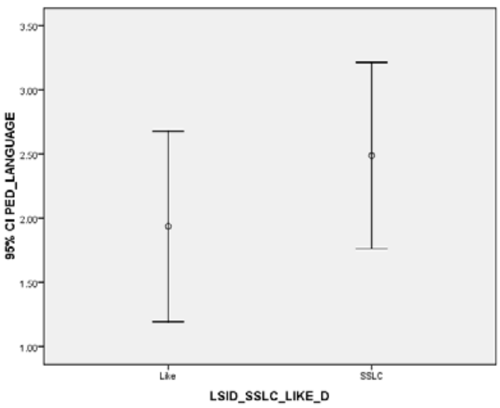


Figure 3.105 Pedagogy: Language 95% Error Bar Chart

The box plot (Figure 3.104) and the 95% error bar chart (Figure 3.105) indicate identical medians for SSLC and non-SSLC Like schools, however there are more outliers in the upper portion of the scale for SSLC school leaders. Likewise, the distributions for SSLC and non-SSLC school leader responses were similar, although the mean for SSLC schools was higher.

On average leaders exposed to an SSLC environment reported higher levels of Pedagogy: Language by over half a point (M=2.49, SD=2.42) in their schools compared to those leaders not exposed to an SSLC environment (M=1.94, SD=1.76). However, this difference was not statistically significant t (67) =0.985, p>0.05; and represented a small effect size d=0.26.

Pedagogy: Vocation

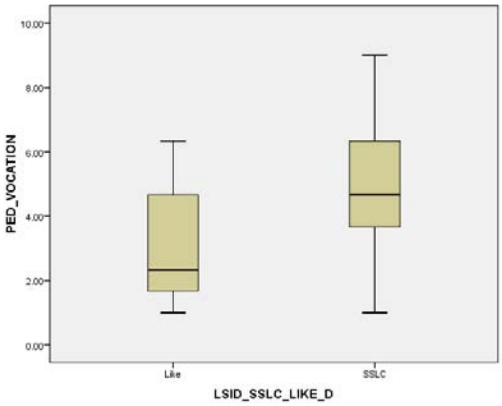


Figure 3.106 Pedagogy: Vocation Box Plot

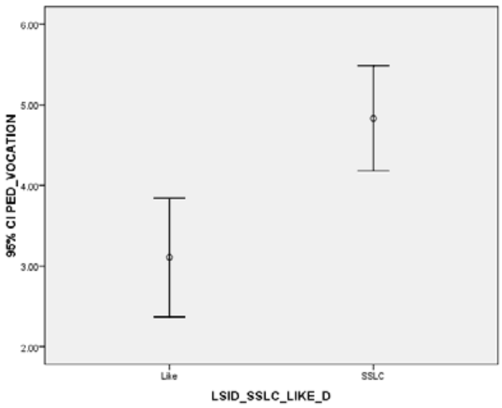


Figure 3.107 Pedagogy: Vocation 95% Error Bar Chart

The box plot (Figure 3.106) and the 95% error bar chart (Figure 3.107) indicate a slight difference in level and distribution of the construct values between those leaders' observations in a school with an SSLC influence and those schools who do not have an SSLC influence. Nearly 90% of the SSLC schools are above the median value of the non-SSLC schools with a slightly tighter distribution around the mean.

On average leaders exposed to an SSLC environment reported higher levels of Pedagogy: Vocation by almost 2 points (M=4.83, SD=2.15) in their schools compared to those leaders not exposed to an SSLC environment (M=3.11, SD=1.78). Further, this difference was statistically significant t (67) =3.401, p<0.05; and represented a large effect size d=0.87.

Finding 36: SSLC school leaders reported higher levels of vocational pedagogy than non-SSLC school leaders.

3.8.4 Analysis of Covariance (ANCOVA)

To plumb the possible effect of other determiners on the level of the pedagogy component and to adjust for possible confounding effects a factorial ANCOVA was also employed. The model consisted of the construct as the dependent variable with the categorical variables SSLC exposure (yes, no), location (metropolitan vs provincial or remote/very remote), and school type (primary, secondary) being entered as fixed factors. The continuous variable of percentage of Indigenous students enrolled was entered as a covariate.

The ANCOVA models reinforced the results of the independent sample T-tests with the following comments.

Pedagogy: Conventional: Pedagogy: Conventional was found to be related to % Indigenous $p<.05$; partial $\eta^2= 0.096$), in that a higher % of Indigenous students was related to greater use of these strategies. A medium effect was also noted for school level, in that leaders from primary schools (M=5.63) reported higher scores on this construct than leaders from secondary schools (M=3.92), $p<.05$; partial $\eta2= 0.084$.

Finding 37: Leaders of schools with higher % of Indigenous students reported higher levels of conventional pedagogies.

Finding 38: Leaders of primary schools reported higher levels of conventional pedagogies than leaders of secondary schools.

Pedagogy: Progressive: Location ($p<.05$; partial $\eta^2= 0.073$) had statistically significant medium effects on leaders' perceptions of the use of progressive pedagogy strategies within their schools. Leaders from metropolitan schools were less likely to report the use of progressive strategies in their schools (M=2.96), compared to leaders from non-metropolitan schools (M=4.30). The difference between primary and secondary schools was trending towards significance ($p=.09$); effect size approaches medium (partial $\eta^2= 0.050$). Specifically, leaders from secondary schools were less likely to report the use of progressive strategies (M=2.81) compared to leaders from primary (M=4.09) schools.

Finding 39: Leaders from metropolitan schools reported higher use of progressive strategies in their schools compared to leaders from non metropolitan schools.

Finding 40: Leaders of primary schools were more likely to report higher levels of progressive pedagogies than leaders of secondary schools.

Pedagogy: Community/ Indigenous: Both % Indigenous and school level had medium effects on leader perceptions of Pedagogy: Community/ Indigenous (% Indigenous $p<.05$; partial $\eta^2= 0.084$; School Level $p<.05$; partial $\eta^2= 0.075$). Primary leaders reported higher (M=4.92) scores on the Pedagogy: Community component than secondary school leader scores (M=3.46). The difference between SSLC and non-SSLC schools was trending towards significance ($p=.09$); effect size approaches medium (partial $\eta^2= 0.049$).

Finding 41: Leaders of schools with higher percentages of Indigenous students reported higher levels of community/ Indigenous pedagogies.

Finding 42: Leaders of primary schools reported higher levels of community/ Indigenous pedagogies than leaders of secondary schools.

Finding 43: Leaders of SSLC schools were more likely to report higher levels of community/Indigenous pedagogies than leaders of non-SSLC schools.

Pedagogy: School Subjects: School level had a large effect on leader perceptions of Pedagogy: School Subjects ($p<.05$; partial $\eta^2= 0.229$). Leaders from primary schools reported greater prominence of school subjects in pedagogy (M=6.95) compared to secondary schools (M=5.01). The difference between SSLC and non-SSLC schools was trending towards significance ($p=.06$); effect size approaches medium (partial $\eta^2= 0.059$). The difference between metro (M=5.77) and non-metro schools (M=6.82) was trending towards significance ($p=.08$); effect size approaches medium (partial $\eta^2= 0.053$).

Finding 44: Leaders of primary schools reported higher levels of school subject pedagogies than leaders of secondary schools.

Finding 45: Leaders of SSLC schools were more likely to report higher levels of school subject pedagogies than leaders of non-SSLC schools.

Finding 46: Leaders of non metro schools were more likely to report higher levels of school subjects pedagogies than leaders of metro schools.

Pedagogy: Language: The teaching and speaking of Indigenous languages was more likely to occur in schools with a high % of Indigenous students, which was evidenced by a large effect size ($p<.05$; partial $\eta^2= 0.491$).

Finding 47: Leaders of schools with a higher percentage of Indigenous students reported higher levels of Indigenous language pedagogies, but the overall levels are low.

Pedagogy: Vocational: The ANCOVA results demonstrated a significant effect of SSLC status (p<.05; partial η^2= 0.107) and % Indigenous (p<.05; partial η^2= 0.067) with medium effect sizes. School level had a large effect on leader perceptions of Pedagogy: Vocational (p<.05; partial η^2= 0.144). Leaders from secondary schools reported greater focus on vocational content in pedagogy (M=4.79) than primary schools (M=3.51).

Finding 48: Leaders of secondary schools reported higher levels of vocational pedagogies than leaders of primary schools.

Finding 49: Leaders of SSLC schools reported higher levels of vocational pedagogies than leaders of non-SSLC schools.

Finding 50: Leaders of schools with a higher percentage of Indigenous students reported higher levels of vocational pedagogies.

3.9 Analysis of Student Outcomes: Attendance and Achievement

3.9.1 Introduction

Below we present out our analysis of student outcomes for schools in the SSLC, inclusive of their Hub and Affiliate schools. The outcomes analysed here were publicly reported levels of school attendance and student achievement on NAPLAN tests in reading, numeracy and writing.

The school sample

The initial school sample used in both these analyses was composed of all SSLC Hubs and Affiliates from 2009 and 2010, and the evaluations ‘Like’ school matching sample. The Like school sample allows the evaluation to benchmark Stronger Smarter school performance against comparable schools. Like schools were chosen to match Stronger Smarter counterparts from the ACARA ‘similar school’ lists (available from the MySchool website). The total number of Like schools was designed to be larger than the SSLC sample, in at 2:1 ratio (Like: Strong Smart), to provide a more stable ‘Like’ school estimate of matched schools in the variables of interest to the evaluation. Like schools were selected from the MySchool ‘similar school’ lists with specific interest in matching (as closely as possible) the following characteristics: regional location, jurisdiction, school type (primary /secondary), school size and the percentage of Indigenous students within the schools. Direct consultation with state departments was used to identify specific schools where several optional comparative schools existed, based on the ACARA similar listing. Minor differences between the attendance and achievement samples resulted from differences in data availability.

The data

Data for these outcomes were taken from two sources. Attendance data was drawn directly from the public MySchool website for Hub, Affiliate and Like Schools. Achievement data was obtained directly from ACARA, where available, for the schools from our full Hub, Affiliate and Like schools. Details of each sample are presented separately below.

In the reporting of systemic data the acronym “ATSI” is used in figures; the term is used by the Australian Bureau of Statistics (ABS) and other government departments in the reporting of population and sample data. We acknowledge that this term has been critiqued by Indigenous Elders and Indigenous researchers. We have therefore elected to use the term Indigenous in the analysis and discussion, consistent with this report and its approach.

Methods

For attendance, since nearly all schools in the sample reported three years of data on the MySchool site, from 2008 to 2010, we were able to analyse changes over time for attendance across those years. This allows the evaluation to analyse attendance both before and after schools officially joined SSLC in 2009. The analysis of changes in attendance employed longitudinal multilevel analyses of variance. This procedure allows us the analyses of effects of membership in SSLC over time, above and beyond well known demographic factors that impact on school attendance.

For achievement, NAPLAN gains scores provide the most apparent measure of student achievement that would relate to school effects (as compared with raw achievement scores). Gain trends in student achievement are publicly reported on the MySchool website without explicit statistics (in graphic form only).

In order to statistically test whether or not there have been any significant gains within Strong Smarter Schools, as compared to our Like school comparison group, exact gain scores were calculated for the ‘gain score cohorts’ obtained from ACARA. These gain scores were available for students who sat NAPLAN tests in both 2008 and 2010, for one of three possible gain comparisons (from Year 3 to 5, Year 5 to 7, or Year 7 to 9) in each of the three main domains tested: Reading, Numeracy and Writing. Factorial analysis of variance was used to analyse cohort gain scores of Hub, Affiliate and Like school performance above and beyond differences between year level gains.

Findings

For attendance, the vast majority of between school differences in attendance rates (roughly 78%) is related to between school demographic differences. Over time, while individual schools differences are notable, rates of attendance do not vary significantly from year to year. Taking these general patterns into account, we found:

Finding 51: As of 2010 there is no evidence that SSLC membership has any effect on school attendance.

Finding 52: As of 2010 there is no evidence that SSLC membership leads to greater increases in the rate of improvement in school attendance over time.

For achievement, the vast majority of between cohort differences in achievement gain related to differences between test domain and year level. Taking these differences into account we found:

Finding 53: As of 2010 there is no evidence that SSLC membership leads to improved student achievement in reading, numeracy or writing.

3.9.2 Analysis of Attendance

The Data and Sample

The sample used in our analyses of attendance is composed of all SSLC Hubs and Affiliates from 2009 and 2010, and our ‘Like’ school matching sample for which sufficient data was available. Like schools were chosen to match SSLC counterparts from the ACARA ‘similar school’ lists (available from the MySchool website). As planned, the total number of Like schools is larger than the SSLC sample, in at 2:1 ratio (Like: Strong Smart), to provide a more stable ‘Like’ school estimate of matched schools in the variables of interest to the evaluation. Like schools were selected from the MySchool ‘similar school’ lists with specific interest in matching (as closely as possible) the following characteristics: regional location, jurisdiction, school type (primary /secondary), school size and the percentage of Indigenous students within the schools.

Due to the restricted number of Very Remote matching schools, it was not always possible to match SSLC schools with two ‘like’ schools within the very remote category; thus, the ‘Like’ sample contains fewer than an exact 2:1 ratio, and in some instances these schools were matched with ‘Remote’ area schools (as of 2010 there were no ‘Remote’ schools among SSLC schools). Thus, the overall sample for the analysis below is 287, with 186 Like schools and 101 Strong Smarter schools. Table 3.83, below, shows the distribution of Hub, Affiliate and Like schools across the four categories of ACARA’s location variable.

Table 3.83 **2010 HAL status by Location**

		Location				Total
		Metro	**Provincial**	**Remote**	**Very Remote**	
Affiliate	Count	35	27	0	13	75
	% within Affiliate	47%	36%	0%	17%	100%
	% within Remote	26%	24%	0%	41%	26%
Hub	Count	11	11	0	4	26
	% within Hub	42%	42%	0%	15%	100%
	% within Remote	8%	10%	0%	13%	9%
Like	Count	88	77	6	15	186
	% within Like	47%	41%	3%	8%	100%
	% within Remote	66%	66%	100%	47%	65%
Total	Count	134	115	6	32	287
	% within HAL2010	47%	40%	2%	11%	100%
	% within Remote	100%	100%	100%	100%	100%

For each of the schools in the sample, demographic and attendance data were taken from the publicly accessible MySchool website for each of the available years (since 2008). This data allows us to track these schools from one year prior to the inception of SSLC until 2010, and thus allows analyses of change over time at a school level – for those three years. For each school in SSLC, membership in the network is recorded per year (as schools join and leave the network, we are able to record that per year).

Table 3.84 below shows the distribution of the total numbers of observations. Here, each school per year is an observation (total observation n = 861, 287 * 3) according to SSLC category (Hub, Affiliate, Like, hereafter HAL) and location. The overall percentage of observations per HAL category is the same as that per school in this analysis (despite the fact no schools were members of SSLC in 2008). This is due simply to the fact that SSLC increased membership from 2009 to 2010.

Table 3.84 **Number of Observations by Location**

		Location				Total
		Metro	Provincial	Remote	Very Remote	
Affiliate	Count	105	83	0	39	225
	% within Affiliate	47%	36%	0%	17%	100%
	% within Location	26%	24%	0%	41%	26%
Hub	Count	33	33	0	12	78
	% within Hub	42%	42%	0%	15%	100%
	% within Location	8%	10%	0%	13%	9%
Like	Count	264	231	18	45	558
	% within Like	47%	41%	3%	8%	100%
	% within Location	66%	67%	100%	47%	65%
Total	Count	402	345	18	96	861
	% within HAL2010	47%	40%	2%	11%	100%
	% within Location	100%	100%	100%	100%	100%

Table 3.85 below, shows membership in SSLC by HAL Category as of 2010, and the Year each school joined the network. This table shows the total number of SSLC schools for which there was MySchool l data increased from 43 to 58 between 2009 and 2010. The table also shows that 12 Like schools in this sample have since joined the SSLC in 2011 (as Hub schools). For the following analysis, SSLC membership is Hub and Affiliate status as of 2010 (since 2010 is the last date of attendance outcome currently available).

Table 3.85 **2010 HAL status by Year Joining the SSLC**

	YEAR JOINED			Total
	2009	2010	2011	
Affiliate	32	43	0	75
Hub	11	15	0	26
Like	0	0	12	12
Total	43	58	12	113

From this data two key research questions were analysed in relation to school attendance performance:

1. Is there evidence that membership in the SSLC leads to *higher levels of school attendances*? and
2. Is there evidence that membership in the SSLC leads to greater increases in the *rate of improvement in school attendance over time*?

3.9.3 Does the SSLC lead to *higher levels of school attendances*?

Background: taking school demographics into account

In order to analyse the impact of SSLC on *levels* of school attendance, it is first important to understand two things: a) levels of school attendance are significantly related to both the demographic characteristics of the student population per school and the geographic location of a school, and b) that levels of school attendance are generally stable within schools over time.

For the current sample, differences in attendance levels between schools are very significantly impacted by the schools' location. As Table 3.86, below, demonstrates, mean attendance rates in 'remote' and 'very remote' schools are quite apparently different from their Metropolitan and Provincial counterparts. These differences in means attendance are both statistically significant (ANOVA: F (3, 283) = 90.205, p<.000), and substantial (the differences between group means are approximately 1 standard deviation for 'Remote' schools and 2 standard deviation units for 'Very Remote' – variance accounted for, eta^2 = .49).

Table 3.86 Mean Attendance by Location

Location	Mean Attendance	N	Std. Deviation
Metro	89.89	134	3.49
Provincial	89.57	115	4.32
Remote	80.39	6	14.90
Very Remote	72.79	32	11.37
Total	87.66	287	7.79

Likewise, the demographic background of a schools population significantly relates to the schools attendance rates. Most notable for this analysis are the schools percentage of Indigenous students (identified by ACARA's 'percent Indigenous' measure), and the average socio-economic background of students within schools (here, we use ACARA's ICSEA measure – noting that ICSEA also includes indicators of remoteness and Indigeneity as well as socio-economic indicators). Table 3.87, below reports the correlations between school ICSEA, percent Indigenous and Attendance rates for this overall sample.

Table 3.87 **Pearson correlations of ICSEA, Percent Indigenous and Attendance, n = 288 schools**

	Attendance	ICSEA	Percent Indigenous
Attendance	1		
ICSEA	.72**	1	
Percent Indigenous	-.71**	-.96**	1

**. Correlation is significant at the 0.01 level (2-tailed).

It is important to note that the relationships between ICSEA, the percent of Indigenous students and Attendance are not strictly linear, each facing threshold effects as schools attendance rates reach saturation points. Figure 3.108 below demonstrates this clearly for ICSEA, in which the quadratic fit line $r^2 = .574$, $r = .76$ is a slight improvement on the Pearson R of .72 reported in Table 3.87 above. In addition to noting the 'bunching up' of schools as they reach attendance levels around 90% and higher levels of ICSEA, also note the increase variation between schools at lower ICSEA ranges.

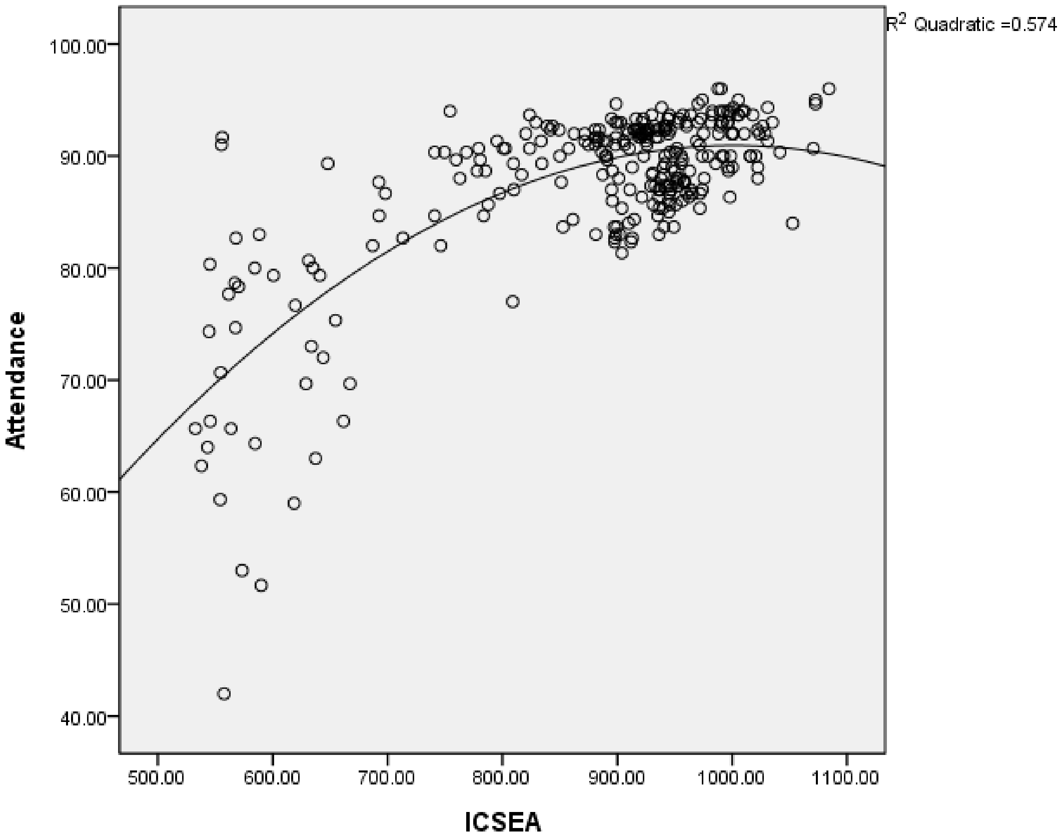
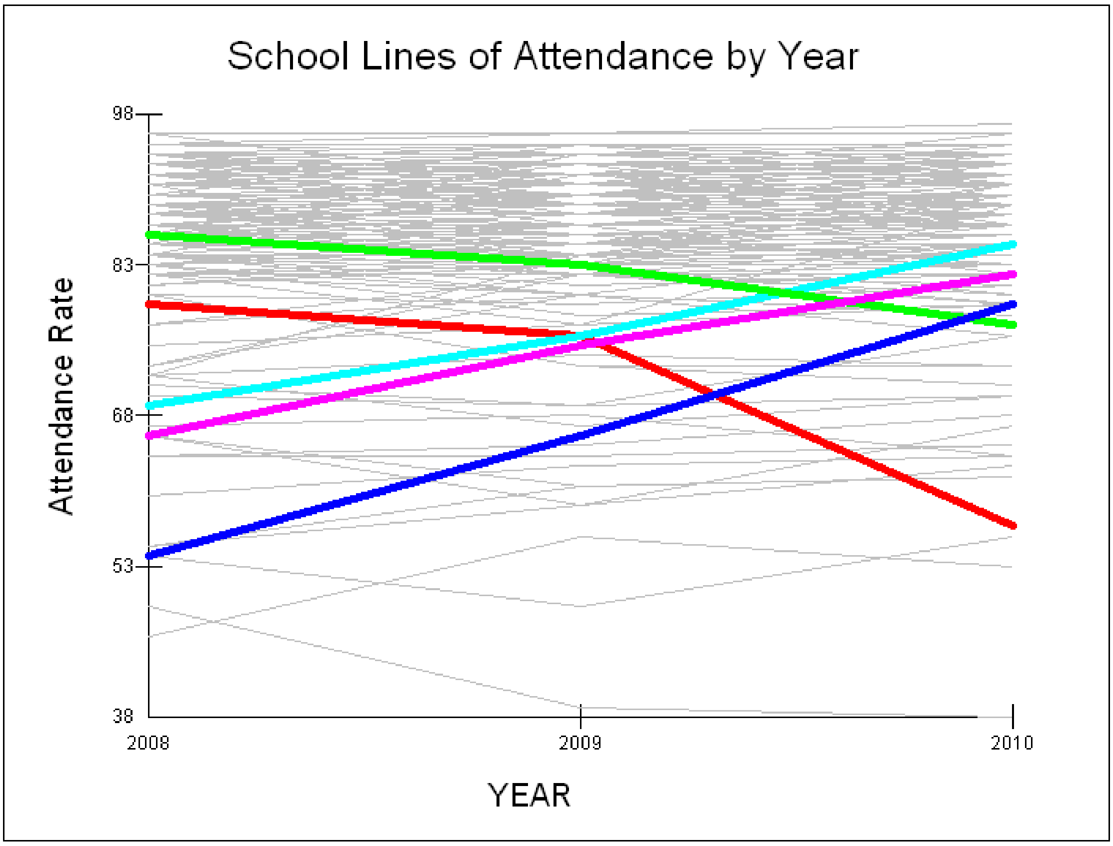


Figure 3.108 **Scatter plot of Attendance by ICSEA**

Background: taking time fluctuations into account

Beyond the demographic factors that influence of attendance rates, it is also important to note that attendance rates do fluctuate over time, as is evident in the year by year data reported on the MySchool website. The important issue here, for the analysis of the influence of the SSLC, is that some of this time fluctuation is not part of any longer term trend upward or downward. Thus, it is crucial to take that 'natural' fluctuation over time into any accounting of school performance on attendance.

To give a sense of what these variations look like, Figure 3.109 below presents a set of line graphs of attendance over the three years 2008-2010. Each school in our full sample is represented in Figure 3.109 as a line, the height of the line is the attendance rate on the 'y' axis, and the year is on the 'x' axis. In Figure 3.109, the degree to which school attendance rates are mostly in the upper ranges (of percentages) is evident by the very large number of school lines in the upper half of the graph (illustrating again the threshold shown earlier in relation to ICSEA and Attendance rates).



Red = Like School (declining)
Blue = Like School (increase)
Green = SSLC School joined 2009 (decreasing)
Cyan = SSLC School joined 2009 (increase)
Magenta = SSLC School as of 2011 (increase prior to being SSLC)

Figure 3.109 School line graphs of Attendance by Year (2008-2010)

To illustrate the nature of time fluctuations and how it has to be considered for this analysis, five illustrative schools have been highlighted in Figure 3.109, with bold coloured lines. The school represented by the bold red line is a Like school with a steadily declining attendance rate from 2008-2010. The bold blue line represents another Like school, but in this case with a steep increasing attendance rate. The green line is an SSLC school which joined in 2009 and has a declining rate of attendance from 2008-2010 (at the mid point, when the school joined the SSLC, there is no shift in trend). The Cyan line is another SSLC school which joined the SSLC in 2009, but has an increasing attendance rate (again with no shift in the rate of increase in 2009), and the Magenta line was a Like school but is now a SSLC school that joined after the dates of this graph, in 2011.

Finally, before addressing the question of the effect of being in the SSLC on the level of attendance rates directly, it is also important to note that the amount of variance in attendance rates over time is not equally spread across the school population. Above we noted that the differences in attendance rates between schools decreased with higher average levels of the student population's socio-economic background (ICSEA being the proxy measure here). That relationship does not only hold in relation to *between school* differences, but also in relation to *within school* differences.

Figure 3.110 below, plots school attendance rates for each school and each year of data in our analysis. The same schools whose trend lines were highlighted above are again highlighted, to illustrate the degree to which within school variation (over time) decreases as the level of ICSEA increases. Note, in Figure 3.110, even without identifying schools in the upper ends of the ICSEA scale, it is clear the variation they might have from year to year can not be the same of those evident by comparing the placement of the three points for our highlighted illustrative schools. (The spread for each of these illustrative school cases is greater than the total spread of schools in the top range of ICSEA.)

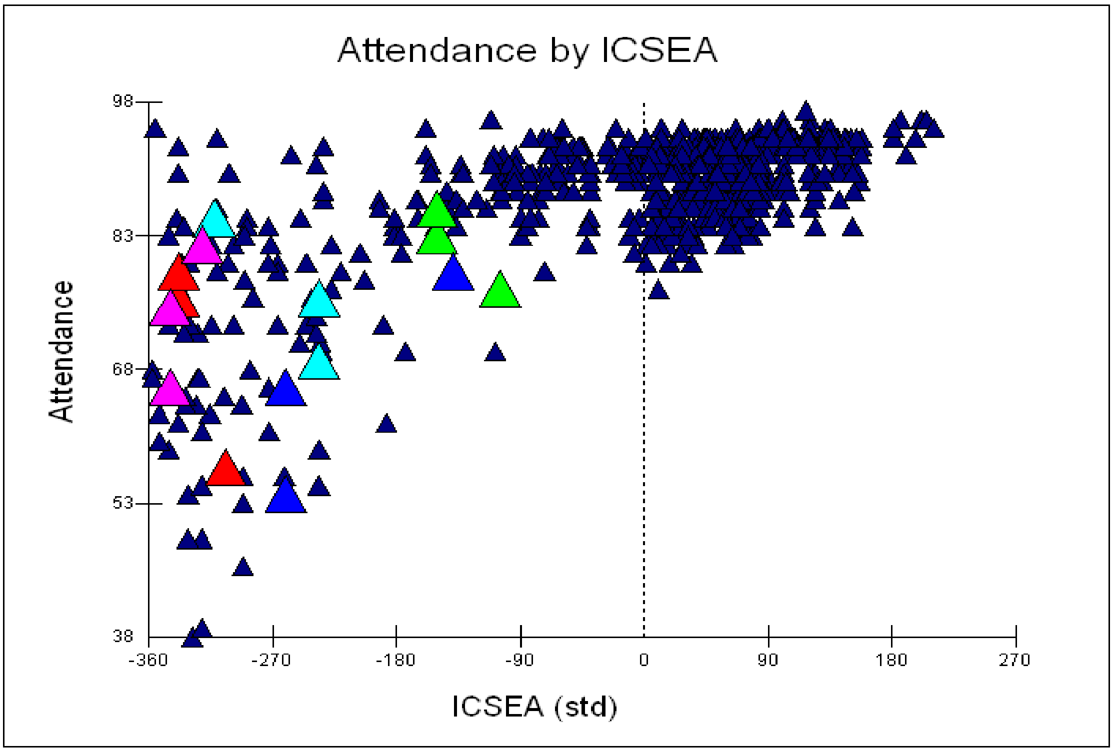


Figure 3.110 Variance in Attendance by ICSEA

Figure 3.111 below presents the same set of schools lines as presented above, but this time broken into the four location categories: Metropolitan, Provincial, Remote and Very Remote. This set of graphs demonstrates both how the level of attendance rates differ by demographic backgrounds (in this case geographic location) and how schools which are not in Metropolitan areas (where ICSEA is also higher) tend to have greater levels of over time variance in attendance rates. (Our highlighted schools fall into the Provincial and Very Remote categories).

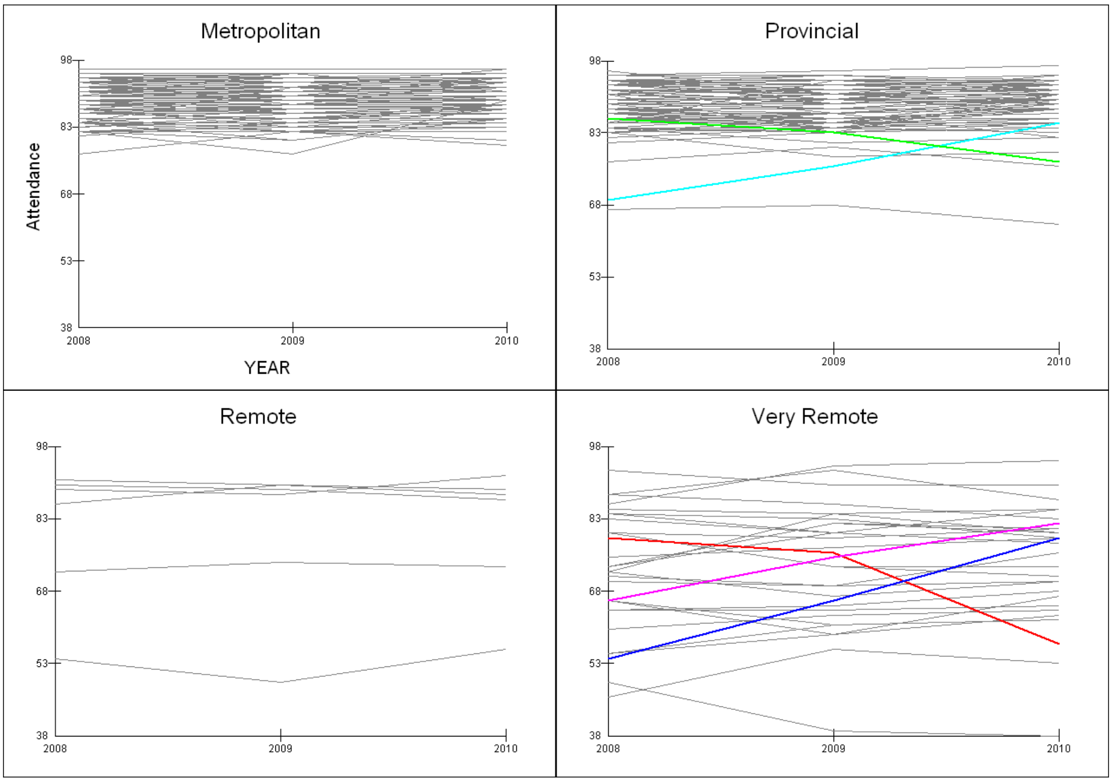


Figure 3.111 School Attendance Rate Lines over time, by Location category

Given these background conditions, to address the first research question about attendance rates, 'is there evidence that membership in the SSLC leads to *higher levels of school attendances*?', the data taken from MySchool for this total sample of schools and each available year, attendance rates were analysed using a multilevel analysis of variance (where 'year' at level 1 lies within 'school' at level 2). This analysis allows us to partition out the variance between schools from the within school over time variance, and to control for the effects of the main background characteristics of interest (percent Indigenous, ICSEA and location).

The general distribution of the background variables used in this analysis is presented below in Table 3.88 (location distributions were noted above, see Table 3.84). While some differences between HAL categories on these variables can be noted, (e.g. the percent Indigenous for Hub schools is higher, and ICSEA for Like schools is higher – and these differences are statistically significant due to sample size), none of these differences are substantive (raw explained variances are below 3% in each case).

Table 3.88 Descriptive Statistics for Indigenous, Attendance and ICSEA.

		Percent Indigenous	Attendance	ICSEA
Affiliate	Mean	29.29	86.15	865.19
$Eta^2 = .020$	N	225	225	225
	Std. Deviation	33.315	10.15	144.72
Hub	Mean	35.29	84.97	848.10
$Eta^2 = .025$	N	78	78	78
	Std. Deviation	36.40	8.91	143.95
Like	Mean	22.32	88.56	892.79
$Eta^2 = .014$	N	558	558	558
	Std. Deviation	28.62	6.72	124.25
Total	Mean	25.35	87.65	881.60
	N	861	861	861
	Std. Deviation	31.06	7.98	132.53

Table 3.89, below, presents the results of seven sequential multilevel analyses of attendance, designed to first demonstrate the impact and relationships among background variables and then to assess the possible impact of SSLC membership. In all of these analyses, 'Year' is at Level 1, and lies within 'School' at level 2. The seven models are: A) the null model (used as a baseline variance decomposition), B) a model with Percent Indigenous added on its own, C) a model with ICSEA added on its own using the grand sample mean (since ICSEA has no meaningful zero value) and with varying slopes and intercepts (to account for the pattern of variance across the range of ICSEA noted above), D) a model with three dummy variables accounting for geographic location ('Remote' in which Metropolitan is taken as the reference category), E) a model with both Remote and ICSEA included – to demonstrate the relative independent effects of each, F) a model with all demographic variables, and finally G) a model with SSLC membership included to assess its effect above and beyond all demographic characteristics. Membership in SSLC is a dummy variable ('0' = not, '1' = member) coded for each year a school was in the network.

Each model is presented in two columns, which report variances (**$\sigma^{2)}$** and effect (**β**) estimates first, followed by the standard errors (**se**) of each. . Below the variance component row reports (for each model), the percentage of variance at each level is reported. Fixed effect estimates are reported in the next rows with standard errors, followed by a calculation of the proportion of variance explained by the added background variables (relative to the null model). Intercept estimates (and standard errors) are reported in the first row of the fixed effects portion, followed by the estimated variance components. The random parameter estimates follow the fixed effects (all of which relate to ICSEA). In the final rows of the table, the deviance statistic, -2loglikelihood estimates, is reported for each model, as the differences in these (between the null model and subsequent models) allows for an assessment of model improvement.

There are three key results from this analysis that should be kept in mind before considering the possible effect of membership in the SSLC. First, a very large amount of the variance between schools is accounted for by each of the three available demographic measures (see Model B, C and D). The percent of Indigenous accounts for 51.78% of level 2 variance, ICSEA (with random slope and intercept) accounts for 73.67% and geographic location (Remote) accounts for 50.19%. There is a very significant amount of co-linearity among these variables, and ICSEA itself actually incorporates the other two along with an estimate of socio-economic class. Therefore, the question for this analysis is how best to take the combination into account.

Second, allowing the models to include the degree to which ICSEA varies both between and within schools (over time changes occur in the ACARA data) provides a much better fit than constraining it to a fixed effect (thus, ICSEA also accounts for 49.53% of the over time within school variance in attendance)[1]. However, the largest effects related to demographic indicators can be seen in Model D, where 'Remote' and 'Very Remote' schools have quite substantial negative effects (essentially indicating a difference in the mean level of attendance relative to the reference category (Metropolitan) of -9.50 and -17.10 respectively.

Third, once geographic location (Remote) is included in the model, sequentially adding the other demographic variables (Model E and F) allows us to come to a model that includes all three important demographic variables, noting each provides improvement model fit (differences in the deviance statistics from preceding models are 612 with three added parameters of ICSEA (fixed and two random effects) to Remote, Model E, while adding Indigenous to these two results in a difference in the -2loglikelihood of 11.5 with that one additional parameter, Model F). The inclusion of ICSEA and Indigenous does not just improve model fit, however; they also demonstrate that much of the differences noted in relation to geographic location are substantially reduced as these two factors are taking into account. Model F (that accounts for 76.73% of between school variance, and 52.48% of level 1 between years - within school variance) gives us a comparison from which to judge the effect of membership in SSLC. This allows us to simply add an indicator of SSLC membership to directly address with our first question about the effects of SSLC on school attendance: Is there evidence that membership in SSLC leads to *higher levels of school attendances*?

Model G in Table 3.89 reports the results of adding SSLC membership to our demographic background model of attendance. Note that there is no notable change in any other parameter estimate between Model F and G and that the effect of being in SSLC is both very small (.01) and statistically not significant (se =. 16, i.e., more than the effect measure). Additionally, note that the model fit does not change at all (the deviance statistics for both model F and G

[1] It is also possible to model the interaction of ICSEA, Remote and ATSI by including interaction effect parameters into the model. Doing so essentially lowers the level of effect of the Remote categories while increasing the overall effects of the others two – with some overall improvement in the model fit statistics; however, this also adds another seven parameters to the model (ICSEA x P; ICSEA x R; ICSEA x VR; ICSEA x ATSI; ATSI x P; ATSI x R; ATSI x VR). For parsimony these interactions have not been included here.

are identical). Thus, we have to conclude that as of 2010 there is no evidence that SSLC has had any network effect on school attendance.

Table 3.89 **Multilevel Analysis of Attendance, N = 861 (3 observations per 287 schools)**

		MODEL A		MODEL B		MODEL C		MODEL D		MODEL E		MODEL F		MODEL G	
		null model		Indigenous		ICSEA *		Remote (M)		Remote & ICSEA		All Demographic		SSLC	
Variance components															
		σ2	**se**	**σ2**	**se**	**σ2**	**se**	**σ2**	**se**	**σ2**	**se**	**σ2**	**se**	**σ2**	**se**
Level 2 - School		58.84	5.04	28.38	2.50	15.49	1.66	29.31	2.58	13.02	1.43	13.70	1.45	13.68	1.44
Level 1 - Year		4.72	0.28	4.77	0.28	2.38	0.20	4.72	0.28	2.31	0.19	2.24	0.19	2.24	0.19
	Level 2	92.57%		85.61%		86.67%		86.12%		84.92%		85.92%		85.92%	
Proportion of **σ2**	Level 1	7.43%		14.39%		13.33%		13.88%		15.08%		14.08%		14.08%	
Fixed Effects				**β**	**se**	**β**	**se**	**β**	**se**	**β**	**se**	**β**	**se**	**β**	**se**
Intercept		87.66	0.46	92.00	0.41	88.65	0.27	89.89	0.48	89.21	0.33	90.16	0.43	90.16	0.43
SSLC														.01	.16
Indigenous %				-0.17	0.01							-0.06	0.02	-0.06	0.02
ICSEA						0.02	0.00			0.01	0.00	0.01	0.00	0.01	0.00
Provincial								-0.32	0.71	0.41	0.42	0.73	0.43	0.74	0.43
Remote								-9.50	2.32	-2.26	2.24	-1.03	2.28	-1.02	2.28
Very Remote								-17.10	1.09	-12.39	1.52	-9.15	1.79	-9.14	1.79

Random parameters (ICSEA)											
slope variance	Level 2	**σ2u1**	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
slope / intercept covariance		**σu01**	-0.07	0.01		-0.05	0.01	-0.04	0.01	-0.04	0.01
slope variance	Level 1	**σ2e1**	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00
slope / intercept covariance		**σ2e01**	-0.02	0.00		-0.02	0.00	-0.02	0.00	-0.02	0.00
Proportion of **σ2** explained	Level 2	51.78%	73.67%		50.19%	77.87%		76.73%		76.75%	
	Level 1	-0.97%	49.53%		0.00%	51.04%		52.48%		52.52%	
-2loglikelihood	4826.81	4631.09	4083.75		4634.21	4021.80		4010.29		4010.29	
	Difference from null model	195.72	743.07		192.60	805.02		816.52		816.53	
	Difference from preceding model					612.42		11.51		0.00	

Effects on rate of change in attendance?

While our first question asked what effect SSLC might have on levels of attendance, it is important to realise that the network effects could not relate to overall initial levels of attendance, but could relate to over time rates of change. These are very different phenomenon that must be distinguished and analysed separately. To understand the difference, consider the school line graphs shown above in Figure 3.109. If SSLC had an effect on levels of attendance, that would be seen in a gap in the overall level (up or down at a given point) at or near the point (in time) of entering the network. The models above essentially tested that hypothesis. However, it is possible that initial entry into the network could have no effect, but SSLC membership could be related to a change in the slope of a school line, relative to comparable schools.

In multilevel longitudinal analyses, this is modelled by developing an indicator of the length of time an independent effect obtains, in this case an indicator of how long a school is in the network. For the current analysis, this is simply done by including a variable indicating the number of years a school is a member of SSLC, for each year. We have named this variable 'TENURE', and the values of this variable change with each year of membership. For schools that joined the network in 2009 (and stayed in), the value of TENURE was 1 in 2009 and 2 in 2010, and so on.

Table 3.90, below, reports the results of this final multilevel analysis, this time with the inclusion of the measure of length of time in the network into the previous model of background demographic effects and network members (Model H). For comparison, results from the preceding model (G) are also repeated in Table 3.90.

Table 3.90 Multilevel Analysis of Rate of Change in Attendance, N = 861 (3 observations per 287 schools)

		MODEL A		MODEL G		MODEL H	
		null model		Background plus SSLC		SSLC plus TENURE	
Variance components							
		σ2	**se**	**σ2**	**se**	**σ2**	**Se**
Level 2 – School		58.84	5.04	13.68	1.44	13.58	1.43
Level 1 – Year		4.72	0.28	2.24	0.19	2.23	.19
	Level 2	92.57%		85.92%		85.87%	
Proportion of **σ2**	Level 1	7.43%		14.08%		14.13%	
Fixed Effects				**β**	**se**	**B**	**Se**
Intercept		87.66	0.46	90.16	0.43	90.14	0.43
SSLC				.01	.16	-.056	.36
TENURE						.47	.27
Indigenous %				-0.06	0.02	-0.06	0.02

ICSEA			0.01	0.00	0.01	0.00
Provincial			0.74	0.43	0.74	0.43
Remote			-1.02	2.28	-.95	2.23
Very Remote			-9.14	1.179	-9.11	1.79
Random parameters (ICSEA)						
slope variance	Level 2	**σ2u1**	0.00	0.00	0.00	0.00
slope / intercept covariance		**σu01**	-0.04	0.01	-0.04	0.01
slope variance	Level 1	**σ2e1**	0.00	0.00	0.00	0.00
slope / intercept covariance		**σ2e01**	-0.02	0.00	-0.02	0.00
Proportion of **σ2** explained	Level 2		76.75%		52.16%	
	Level 1		52.52%		53.17%	
-2loglikelihood	4826.81		4010.29		4007.319	
	Difference from null model		816.53		819.49	
	Difference from preceding model				2.97	

There are four main things to note in the results of Model H. First, neither the effect of being in the network (SSLC), nor the amount of time in the network (TENURE) carries significant effect.

That is, neither effect measure is greater than the 1.96*se required to reach the 95% confidence interval. Although the effect estimate of Tenure is positive (indicating a slight increase in the rate of attendance level change), the fact that it is not statistically significant means that we cannot rule out the possibility this is simply due to chance. Second, the inclusion of Tenure has had little to no effect on any other parameter (there are very minor decreases in the 'remote' and 'very remote' effects sizes, but these are not significant). Third, including this parameter does actually decrease the amount of variance explained at level two (between schools), indicating that the overall pattern of increasing attendance rates overshadows any plausible effect of the length of time in SSLC. And fourth, adding this parameter does not significantly improve model fit estimates (the difference of 2.97 in the -2loglikelihood from Model G falls below the 95% significance level X^2 for one degree of freedom).

Thus, although it is plausible that membership in SSLC could lead to increases in the rate of improvement in attendance, this analysis suggests that as of 2010 there is no evidence that membership in SSLC leads to greater increases in the rate of improvement in school attendance over time based on the publically reported attendance rates of MySchool.

3.9.4 Findings from Analysis of Attendance Data

Based on our analyses of publically reported attendance rates of the MySchool data, there are two main findings in relation to school attendance rates: As of 2010 there is no evidence that SSLC has had any network effect on school attendance, or that SSLC membership leads to greater increases in the rate of improvement in school attendance over time.

3.10 Gains Score Analysis

Since the central tenet of the Strong Smarter approach is to have positive effect on students' achievement, the central question addressed in the analysis below is simply: *'Is there evidence that membership in SSLC has led to improved student achievement*?'

To examine whether membership in SSLC is linked to improvements in student outcomes on NAPLAN results, gain score data for relevant age cohorts were obtained for all Stronger Smarter and Like Schools available from ACARA. This gain score data consisted of the mean scores per test domain per gain cohort for Hub, Affiliate and Like schools. ACARA also provided gain score data of their 'Similar' schools for each of the identified Like, Affiliate and Hubs schools.

Since SSLC is intended to strengthen school impact on student outcomes over time, NAPLAN gains scores provide the most apparent measure of student achievement that would relate to school effects (as compared with raw achievement scores). Gain trends in student achievement are publicly reported on the MySchool website without explicit statistics (in graphic form only). In order to statistically test whether or not there have been any significant gains within SSLC Schools, as compared to our Like school comparison group, exact gain scores were calculated for the 'gain score cohorts' obtained from ACARA. These gain scores were available for students who sat NAPLAN tests in both 2008 and 2010, for one of three possible gain comparisons (from Year 3 to 5, Year 5 to 7, or Year 7 to 9) in each of the three main domains tested: Reading, Numeracy and Writing.

Thus, cohort gains scores could be calculated as at 2010 for each SSLC school, their Like school counterparts as well as for the MySchool 'Similar' School population. It should be noted that secondary schools which do not include either Year 7 or Year 9 are excluded from this analysis, since school level identified gains are not available from ACARA for these schools. Likewise, any gain cohorts of less than five students are not available as per ACARA protocol.

School and Gain Cohort sample

Schools for this analysis were selected in the same manner as that reported for analysis of attendance rates. The resulting sample, based on available ACARA gain cohort data, included 27 Hub schools, 58 Affiliate schools and 130 matched like schools (a 2:3 ratio of SSLC schools to like schools), giving a total school sample of 215.

From these schools a total of 321 gain cohort scores were calculated. As Table 3.91 below reports, these gain cohorts were distributed across the Hub, Affiliate and Like groups in a roughly equivalent proportion as were schools themselves.

Table 3.91 Gain Score Cohort by HAL School Category

	Frequency	Percent
Hub	47	14.6
Affiliate	88	27.4
Like	186	57.9
Total	321	100.0

The average number of gain cohorts per schools in this analysis is approximately 1.5

Gains by Age Cohort

Before determining whether or not gain score differences between SSLC Schools, their Like school counterparts or the MySchool 'Similar Schools' are noteworthy, it is first important to keep in mind the well known patterns of gain scores over time, through the year levels of schooling. That is, within any one test construct, gains scores will generally decline over time, as students get older and move through year levels of schooling. For NAPLAN data, this change is evident when comparing the three available 'Gain Cohorts.' That is, students who took the Year 3 NAPLAN test in 2008 and the Year 5 test in 2010 are the Gain Cohort 3-5 (for 2010), and so on.[2] This gives three gain cohorts: 3-5, 5-7, 7-9.

The distribution of Gain Cohort across year levels reflects the overall school sample, taking into account the unavailable secondary cohort scores. Table 3.91 reports the breakdown of cohort according to each year level.

Table 3.91 Gain Cohort by Year Level

		Frequency	Percent
Year level	3-5	167	52.0
	5-7	91	28.3
	7-9	63	19.6
	Total	321	100.0

The changes in gain scores over time is clearly presented below in Figure 3.112 which presents this pattern as a bar graph of the mean gain scores in Reading, Numeracy and

[2] Data from ACARA were only available for gain cohorts within one school, consequently schools which do not cover either end of the gain cohort year range are not included (e.g. all high schools in Queensland do not include Year 7, and thus do not have ACARA gain scores by school).

Writing across the three available Gain Cohorts in the MySchool 'Similar Schools' for all schools in our sample. Note that while the overall amount of gain differs by test domain in every year level, and the amount of change over time in gain scores differs in each test domain, the general pattern of declining gains over time is clear, expected and incorporated into the test construct modelling on which NAPLAN is based.

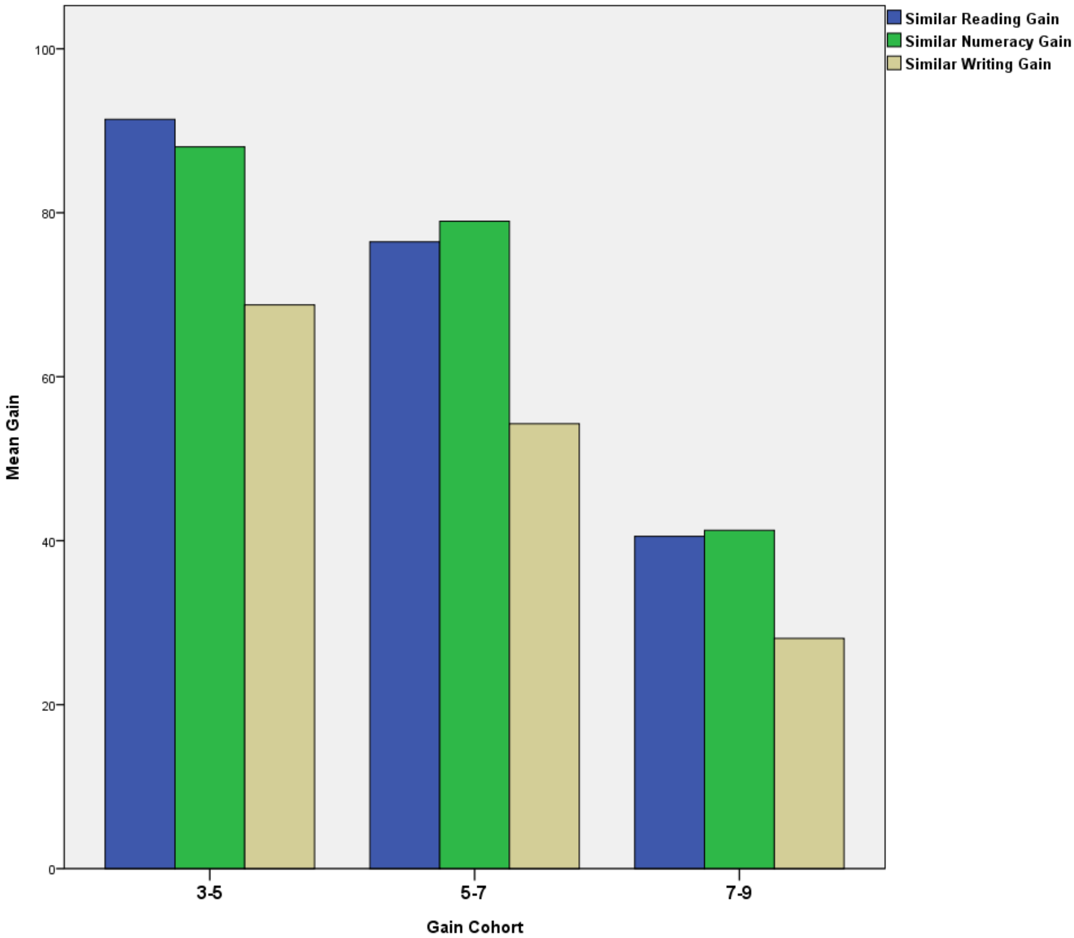


Figure 3.112 Gains in NAPLAN scores by Gain Cohort (My School 'Similar Schools')

Given this change over time, when examining whether or not gain scores in SSLC schools are importantly different from a comparable population of schools, it is essential that differences in age cohorts are disaggregated and comparisons are made only between relevant cohorts.

Comparing Gain Cohort Scores

Cohort gain scores are nested within schools, and ultimately a multilevel analysis that accounts for this data structure will be conducted. However, since many schools in the current sample have an insufficient number of cohorts per test domain per school to conduct a multilevel analysis, the analysis below will treat each gain cohort as the unit of analysis. The process allows a robust comparison of the cohorts across the Hub, Affiliate, Like school categories, in which we are able to test whether or not SSLC membership has led (by 2010) to improvements in student achievement (as measured by NAPLAN) above and beyond what would be expected from the general population of schools. Below compare the gain scores of schools accounting to HAL categories, allowing a direct comparison with our Like sample. It should be noted that this process directly analyses the effects of SSLC members, but does not address school level effects directly. Later multilevel analysis of school effects will be possible once more gain cohorts complete NAPLAN (in future years) and once individual student data is available for analysis.

For all the analyses below, comparisons take into account Year level differences using an ANOVA factorial design (which allows tests of statistical difference to account for differences between Year level) and are disaggregated by test domain. That is, Reading, Numeracy and Writing are all analysed independently. These analyses will be presented in turn.

Table 3.92, below, reports the basic descriptive statistics of these gain scores - taken by subtracting prior year cohort scores (2008) from later years (2010). From these basic statistics the general pattern of declining scores within domain is evident within each column (indicative of the age related changes noted above), and a general pattern of similarity holds across each row, indicating similarity in gains between HAL categories. Exceptions to these general patterns, however, are also evident, thus closer analysis is warranted.

Table 3.92: Mean Cohort Gain Scores by Gain Cohort and HAL Category

Cohort / Test Doman		Hub			Affiliate			Like		
		Mean	sd	N	Mean	sd	N	Mean	sd	N
3-5	Reading	95.15	59.79	21	92.17	52.78	46	92.17	24.30	100
	Numeracy	76.20	22.35	21	84.11	26.21	46	89.88	23.65	100
	Writing	68.33	41.71	21	65.35	26.35	46	68.67	24.54	100
5-7	Reading	74.15	53.10	14	76.26	19.65	25	76.73	23.06	52
	Numeracy	76.92	39.60	14	77.87	25.80	25	81.63	22.48	52
	Writing	55.29	42.66	14	51.88	25.63	25	58.00	25.18	52
7-9	Reading	36.09	12.09	12	48.19	42.17	17	36.21	16.36	34
	Numeracy	37.36	18.03	12	44.06	15.68	17	38.35	14.29	34
	Writing	27.17	27.18	12	21.25	31.75	17	25.15	17.07	34

Below we present Univariate factorial analysis of variance for each test domain.

Reading

Table 3.93 presents mean reading gain scores for Hub, Affiliates and Like cohorts disaggregate into Year level comparison groups. The patterns of these mean scores shows that Hub cohorts had a slightly higher mean than their counterparts in year 5, and Affiliates had a comparable positive difference at Year 9.

Table 3.93 Descriptive statistics for Reading Gains by HAL and Year level

Year Level	Hub Affiliate Like	Mean	Std. Deviation	N
5	Hub	95.15	59.793	20
	Affiliate	92.17	52.776	46
	Like	92.17	24.304	100
	Total	92.53	39.072	166
7	Hub	74.15	53.097	13
	Affiliate	76.26	19.650	23
	Like	76.73	23.060	51
	Total	76.22	28.322	87
9	Hub	36.09	12.087	11
	Affiliate	48.19	42.171	16
	Like	36.21	16.357	34
	Total	39.33	25.387	61
Total	Hub	74.18	54.554	44
	Affiliate	79.59	46.780	85
	Like	77.63	30.700	185
	Total	77.68	39.407	314

Figure 3.113 demonstrates this pattern with a graph of the estimated margin means resulting from the factorial ANOVA analysis.

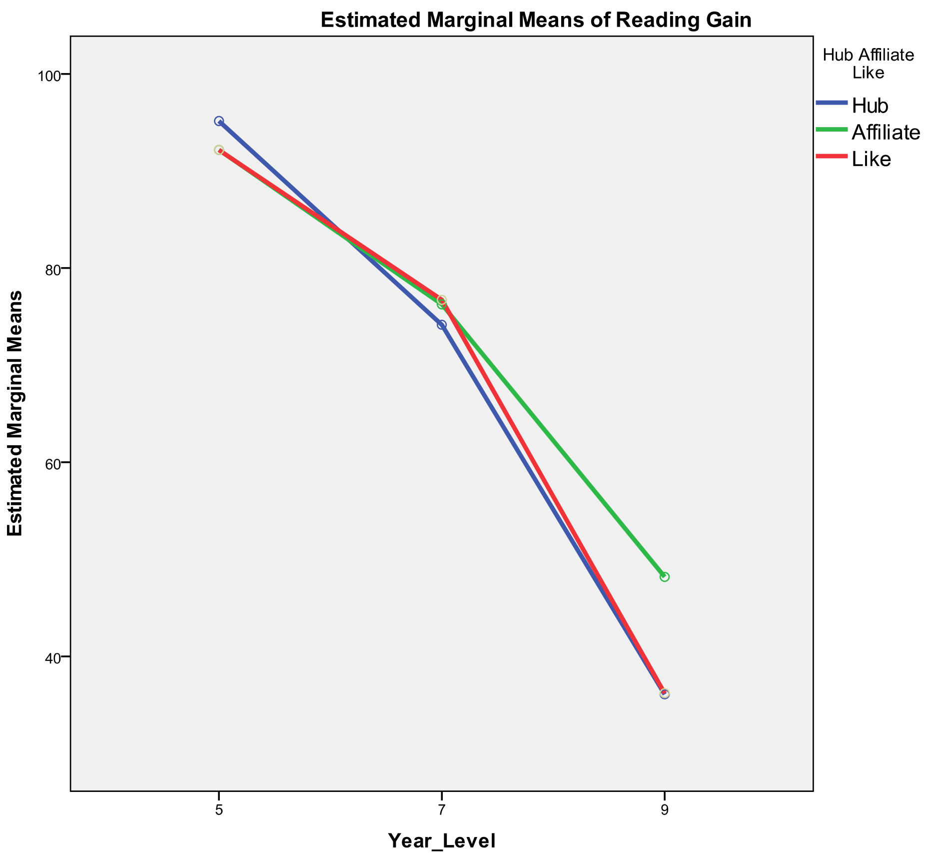


Figure 3.113 Estimated Marginal Means in Reading Gain by Year Level and HAL category

Table 3.94 below presents the effect estimates of the analysis of variance for Reading Gains.

Table 3.94 Between gain cohort effects of HAL and Year level (ANOVA) for Reading

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	128444.408[a]	8	16055.551	13.693	.000	.264
Intercept	972089.652	1	972089.652	829.051	.000	.731
Year Level	95623.188	2	47811.594	40.776	.000	.211
HAL Cat	754.203	2	377.101	.322	.725	.002
Year Level * HAL Cat	1663.965	4	415.991	.355	.841	.005
Error	357622.458	305	1172.533			
Total	2380564.000	314				
Corrected Total	486066.866	313				

a. R Squared = .264 (Adjusted R Squared = .245)

From this analysis it is clear that while Year level differences in gains are statistically significant, HAL membership is neither statistically significant nor of any substantive effect, $F (2, 305) = .322$, $p = .725$, with a partial $\eta^2 = .002$). Likewise, the interaction between HAL and Year level is not significant nor of any substantive effect, $F (4, 305) = .355$, $p = .841$, with a partial $\eta^2 = .005$. Thus for Reading, SSLC membership shows no benefit for 2010 Reading Gains.

Numeracy

Table 3.95 presents mean numeracy gain scores for Hub, Affiliates and Like cohorts disaggregate into Year level comparison groups. The patterns of these mean scores shows that Like cohorts had a higher mean than their counterparts in year 5, and Affiliates had a slight positive difference at Year 9.

Table 3.95 Descriptive statistics for Numeracy Gains by HAL and Year level

Year Level	Hub Affiliate Like	Mean	Std. Deviation	N
5	Hub	76.20	22.353	20
	Affiliate	84.11	26.215	46
	Like	89.88	23.649	100
	Total	86.63	24.533	166
7	Hub	76.92	39.599	12
	Affiliate	77.87	25.800	23
	Like	81.63	22.484	51
	Total	79.97	26.014	86
9	Hub	37.36	18.029	11
	Affiliate	44.06	15.678	16
	Like	38.35	14.289	34
	Total	39.67	15.330	61
Total	Hub	66.47	31.816	43
	Affiliate	74.88	28.572	85
	Like	78.14	29.081	185
	Total	75.65	29.500	313

Figure 3.114 demonstrates this pattern in Numeracy gains with a graph of the estimated margin means resulting from the factorial ANOVA analysis.

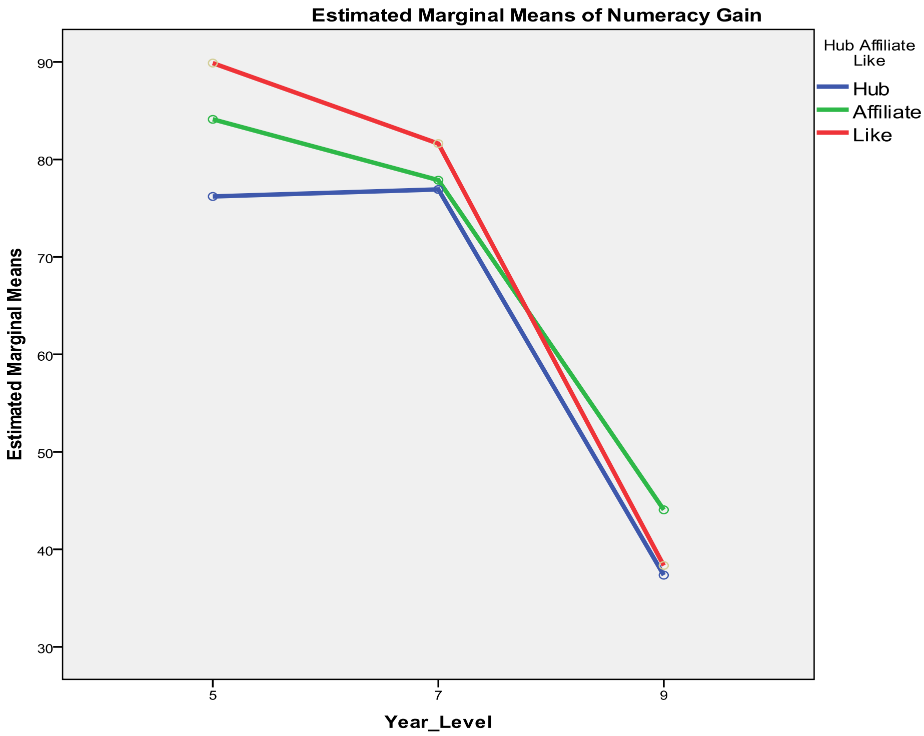


Figure 3.114 Estimated Marginal Means in Numeracy Gain by Year Level and HAL category

Table 3.96 below presents the effect estimates of the analysis of variance for Numeracy Gains.

Table 3.96 Between gain cohort effects of HAL and Year level (ANOVA) for Numeracy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	104886.431[a]	8	13110.804	23.919	.000	.386
Intercept	894688.272	1	894688.272	1632.262	.000	.843
Year Level	67748.194	2	33874.097	61.800	.000	.289
HAL Cat	1326.211	2	663.106	1.210	.300	.008
Year Level * HAL Cat	1768.855	4	442.214	.807	.522	.011
Error	166630.911	304	548.128			
Total	2062724.000	313				
Corrected Total	271517.342	312				

a. R Squared = .386 (Adjusted R Squared = .370)

From this analysis it is clear that while Year level differences in gains are statistically significant, HAL membership is neither statistically significant nor of any substantive effect, F (2, 304) = 1.21, p = . 300, with a partial $\eta^2 = .008$). Likewise, the interaction between HAL and Year level is not significant nor of any substantive effect, F (4, 304) = .807, p = .522, with a partial η^2 = .011. Thus for Numeracy, membership in SSLC shows no benefit for 2010 Reading Gains.

Writing

Table 3.97 presents mean numeracy gain scores for Hub, Affiliates and Like cohorts disaggregate into Year level comparison groups. The patterns of these mean scores shows that Like cohorts had a higher mean than their counterparts in year 7, and H
Hubs had a slight positive difference at Year 9.

Table 3.97 Descriptive statistics for Writing Gains by HAL and Year level

Year_Level	Hub Affiliate Like	Mean	Std. Deviation	N
5	Hub	68.33	41.705	21
	Affiliate	65.35	26.347	46
	Like	68.67	24.543	100
	Total	67.71	27.552	167
7	Hub	55.29	42.662	14
	Affiliate	51.88	25.632	24
	Like	58.00	25.175	51
	Total	55.92	28.421	89
9	Hub	27.17	27.179	12
	Affiliate	21.25	31.746	16
	Like	25.15	17.069	34
	Total	24.53	23.303	62
Total	Hub	53.94	41.586	47
	Affiliate	53.38	31.553	86
	Like	57.73	28.457	185
	Total	55.99	31.499	318

Figure 3.115 demonstrates this pattern in Numeracy gains with a graph of the estimated margin means resulting from the factorial ANOVA analysis.

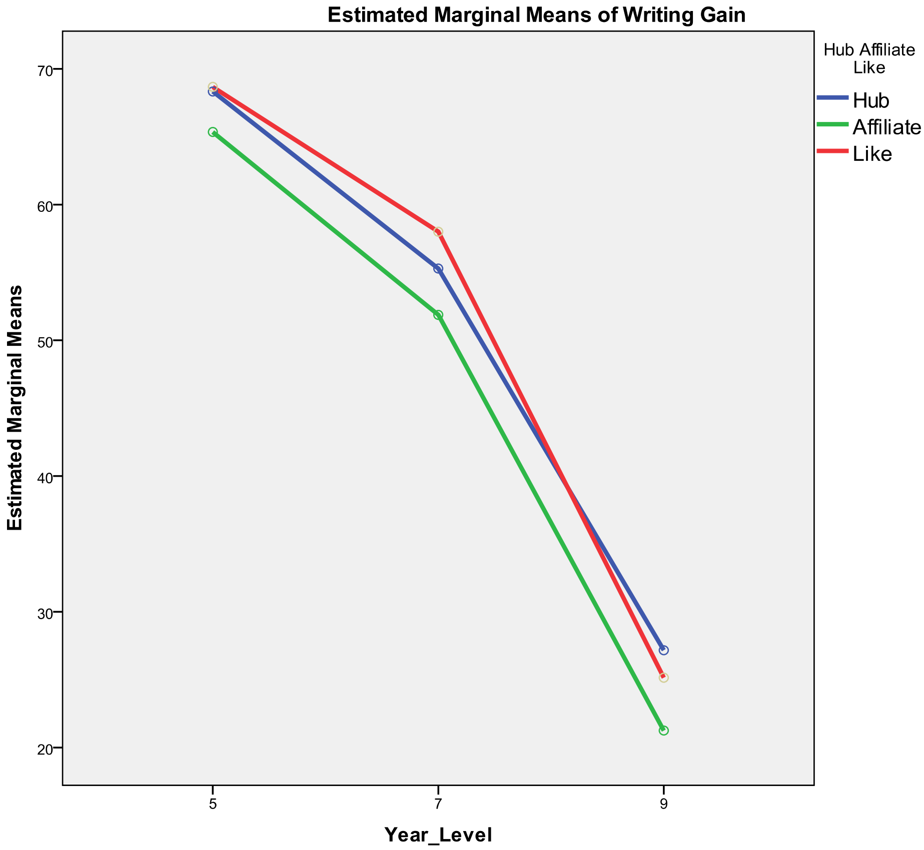


Figure 3.115 Estimated Marginal Means in Writing Gain by Year Level and HAL category

Table 3.98 below presents the effect estimates of the analysis of variance for Writing Gains

Table 3.98 Between gain cohort effects of HAL and Year level (ANOVA) for Writing

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	85548.362[a]	8	10693.545	14.431	.000	.272
Intercept	502309.556	1	502309.556	677.861	.000	.687
Year_Level	65191.797	2	32595.899	43.988	.000	.222
HAL_Cat	1005.866	2	502.933	.679	.508	.004
Year_Level * HAL_Cat	172.764	4	43.191	.058	.994	.001
Error	228975.625	309	741.021			
Total	1311548.000	318				
Corrected Total	314523.987	317				

a. R Squared = .272 (Adjusted R Squared = .253)

From this analysis it is clear that while Year level differences in gains are statistically significant, HAL membership is neither statistically significant nor of any substantive effect,

F (2, 309) = .679, p = .508, with a partial η^2 = .004). Likewise, the interaction between HAL and Year level is not significant nor of any substantive effect, F (4, 309) = .058, p = .994, with a partial η^2 = .001. Thus for Numeracy, membership in SSLC shows no benefit for 2010 Writing Gains.

Summary of Gain Cohort analysis

Analysing differences in Gain cohorts from Hub, Affiliate and Like schools is or most direct way of assessing the degree to which membership in SSLC has is associated with any improved student achievement. **As of 2010, SSLC membership has no demonstrable improvement in student achievement gains on any of the NAPLAN tested outcomes in reading, numeracy and writing.**

It should be noted that further analyses were conducted to detect whether or not the date of joining SSLC, but no significant overall differences were found between intake groups. As additional years of achievement data become available, differences at school level, and over time will be more deeply analysed.

3.11 Findings From Analysis of NAPLAN Gain Data

Based on our analyses of NAPLAN gain scores obtained from ACARA, there is one main finding in relation to student achievement: As of 2010 there is no evidence that SSLC membership leads to improved student achievement in reading, numeracy or writing.

Differences by school

Although insufficient data exists to analyses school level differences, we have compiled the following list (see Table 3.99) of individual cohort gain scores within Hub schools, with an associated effect size measure, relative to the gain of comparable Like schools. From this, it is apparent that there are individual Hub schools with substantial positive gains across many cohorts and test domains. While the analysis above demonstrates that these individual school positive performances are not generalisable across SSLC, they are of potential significant utility for the Stronger Smarter initiative in that they identify specific schools and cohort that are of potential interest for the purposes of shared learning among the network.

Table 3.99 Hub School Gain Score Effect Size by Cohort

- *Effect Sizes have been estimated relative to the pooled standard deviations of gain scores for SSLC and their 'Like' counterparts*
- *Cells are colour coded to indicate strength of positive effect sizes according to conventional rules of thumb: light blue indicates a small effect (d >.2 but < .5), cyan indicated moderate effect (d > .5 but <.8), and green indicates a large effect (d>.8).*

School	Gain Cohort	Reading Gain Difference	Numeracy Gain Difference	Writing Gain Difference	*Reading Effect Size*	*Numeracy Effect Size*	*Writing Effect Size*
3300	7-9	-8.00	-2.00	-10.00	-0.33	-0.17	-0.47
2200	3-5	-40.00	-18.00	52.00	-1.00	-1.00	***2.30***
	5-7	-38.00	.	-66.00	-1.45		-2.74
	7-9	-37.00	5.00	62.00	-1.50	**0.42**	***2.93***
2700	3-5	20.00	1.00	-11.00	*0.50*	0.06	-0.49
	5-7	7.00	-6.00	17.00	**0.27**	-0.27	*0.70*
1300	3-5	7.00	-14.00	-24.00	0.18	-0.78	-1.06
	5-7	-27.00	-31.00	58.00	-1.03	-1.40	***2.41***
	7-9	9.00	-23.00	-23.00	**0.37**	-1.95	-1.09
1600	7-9	-9.00	-4.00	-9.00	-0.37	-0.34	-0.43

School	Gain Cohort	Reading Gain Difference	Numeracy Gain Difference	Writing Gain Difference	***Reading Effect Size***	***Numeracy Effect Size***	***Writing Effect Size***
2300	3-5	-13.00	-8.00	23.00	-0.33	-0.44	***1.02***
900	3-5	-12.00	7.00	-9.00	-0.30	**0.39**	-0.40
	5-7	.00	.00	4.00	0.00	0.00	0.17
	7-9	11.00	12.00	25.00	**0.45**	***1.02***	***1.18***
1000	3-5	-70.00	.	-80.00	-1.75		-3.54
	5-7	-106.00	-105.00	-42.00	-4.03	-4.73	-1.74
2400	3-5	-29.00	-30.00	52.00	-0.73	-1.66	***2.30***
	5-7	-12.00	9.00	5.00	-0.46	**0.41**	**0.21**
	7-9	-27.00	-47.00	-5.00	-1.10	-3.98	-0.24
2500	3-5	-41.00	-38.00	34.00	-1.03	-2.11	***1.51***
3600	3-5	-14.00	1.00	-41.00	-0.35	0.06	-1.82

School	Gain Cohort	Reading Gain Difference	Numeracy Gain Difference	Writing Gain Difference	***Reading Effect Size***	***Numeracy Effect Size***	***Writing Effect Size***
	5-7	-12.00	1.00	-11.00	-0.46	0.05	-0.46
1700	3-5	-8.00	-16.00	59.00	-0.20	-0.89	***2.61***
1800	7-9	10.00	.00	5.00	**0.41**	0.00	**0.24**
3800	3-5	-22.00	-10.00	-2.00	-0.55	-0.55	-0.09
	5-7	-10.00	6.00	13.00	-0.38	**0.27**	*0.54*
2800	3-5	198.00	-58.00	-41.00	***4.96***	-3.22	-1.82
	5-7	-67.00	26.00	-35.00	-2.55	***1.17***	-1.45
1900	7-9	-6.00	3.00	-32.00	-0.24	**0.25**	-1.51
2600	3-5	-2.00	-28.00	13.00	-0.05	-1.55	*0.58*
	5-7	-30.00	5.00	20.00	-1.14	**0.23**	***0.83***

School	Gain Cohort	Reading Gain Difference	Numeracy Gain Difference	Writing Gain Difference	***Reading Effect Size***	***Numeracy Effect Size***	***Writing Effect Size***
4000	3-5	-14.00	-7.00	-15.00	-0.35	-0.39	-0.66
3900	3-5	-12.00	6.00	-11.00	-0.30	**0.33**	-0.49
2000	7-9	-5.00	-6.00	-25.00	-0.20	-0.51	-1.18
2900	3-5	27.00	30.00	-33.00	*0.68*	***1.66***	-1.46
	5-7	54.00	28.00	11.00	***2.05***	***1.26***	**0.46**
	7-9	-6.00	23.00	41.00	-0.24	***1.95***	***1.94***
3500	3-5	-17.00	21.00	23.00	-0.43	***1.17***	***1.02***
2100	7-9	4.00	-4.00	6.00	0.16	-0.34	**0.28**
3400	3-5	-22.00	-24.00	-16.00	-0.55	-1.33	-0.71
600	3-5	18.00	8.00	-5.00	**0.45**	**0.44**	-0.22

School	Gain Cohort	Reading Gain Difference	Numeracy Gain Difference	Writing Gain Difference	***Reading Effect Size***	***Numeracy Effect Size***	***Writing Effect Size***
	5-7	20.00	35.00	52.00	*0.76*	***1.58***	***2.16***
800	3-5	-43.00	-7.00	-29.00	-1.08	-0.39	-1.28
	5-7	.	.	13.00			*0.54*
3000	3-5	.	-9.00	104.00		-0.50	***4.61***
	5-7	98.00	45.00	66.00	***3.73***	***2.03***	***2.74***
	7-9	.	.	-19.00			-0.90

Section 4 Conclusion

4.1. Findings

The findings from Part 3, Quantitative Analysis are listed below:

Finding 1: There are generally high levels of experience and adequate levels of credentials for principals of schools in Indigenous contexts.

Finding 2: While the transfer system is affecting continuity of tenure, approximately a third of SSLC principals have sufficient duration of tenure as principals to generate the conditions for reform.

Finding 3: The levels of overall experience in Indigenous education contexts of the teaching workforce sampled are relatively high.

Finding 4: A majority of teachers sampled reported a lack of sufficient pre and in-service training preparation in Indigenous education.

Finding 5: SSLC teachers reported higher levels of Indigenous school ethos in their schools than non-SSLC teachers.

Finding 6: The percentage of Indigenous students enrolled influences the level of Indigenous involvement in school and community.

Finding 7: SSLC teachers reported higher levels of school community engagement than non-SSLC teachers.

Finding 8: SSLC teachers reported higher levels of promoting high expectations leadership than non-SSLC teachers.

Finding 9: SSLC teachers reported higher levels of high expectation leadership enactment than non-SSLC teachers

Finding 10: Those schools with a higher percentage of Indigenous students were more likely to report including the Indigenous community in leadership roles in the school.

Finding 11: There were no significant differences between SSLC and non-SSLC teacher self-reported levels of Indigenous cultural knowledge.

Finding 12: Primary school teachers rated their schools higher on Indigenous school ethos than secondary school teachers - but SSLC appears to have a similar impact in primary and secondary schools.

Finding 13: Schools with a higher percentage of Indigenous students were more likely to report that they involved members of the Indigenous community in school governance.

Finding 14: Primary school teachers rated their schools higher on promoting high expectations leadership than secondary school teachers - but SSLC appeared to have a similar impact in primary and secondary schools.

Finding 15: SSLC leaders reported higher levels of school governance and community than non-SSLC leaders.

Finding 16: SSLC leaders were more likely to report higher levels of school community engagement than non-SSLC leaders.

Finding 17: SSLC leaders were more likely to report higher levels of Indigenous leadership (teaching) than non-SSLC leaders.

Finding 18: SSLC leaders were more likely to report higher levels of Indigenous leadership (roles) than non-SSLC leaders.

Finding 19: SSLC leaders reported higher levels of innovative school modelling compared to non-SSLC leaders.

Finding 20: Primary school leaders reported higher levels of Indigenous school ethos than secondary school leaders.

Finding 21: Schools with a higher percentage of Indigenous students reported higher levels of school governance and community.

Finding 22: While there was no effect for SSLC, primary school leaders reported higher levels of high expectations promotion than secondary school leaders.

Finding 23: While there was no effect for SSLC, primary school leaders reported higher levels of high expectations enactment than secondary school leaders.

Finding 24: While there was no effect for SSLC, leaders of schools with higher percentages of Indigenous students enrolled reported higher levels of Indigenous leadership (teaching).

Finding 25: While there was no effect for SSLC, leaders of schools with higher percentages of Indigenous students enrolled reported higher levels of Indigenous leadership (roles).

Finding 26: While there was no effect for SSLC, leaders of schools with higher percentages of Indigenous students enrolled reported higher levels of innovative school staffing recruitment.

Finding 27: While there was no effect for SSLC, leaders of schools with higher percentages of Indigenous students enrolled reported higher levels of innovative school staffing.

Finding 28: In addition to the SSLC effect, leaders of schools with higher percentages of Indigenous students enrolled reported higher levels of innovative school modelling.

Finding 29: While there was no effect for SSLC, primary school leaders felt that teacher capacity was less of a constraint on sustainability than secondary school leaders.

Finding 30: There were no differences in reported pedagogy/curriculum practices between SSLC and non-SSLC schools, except higher levels of critical literacy in non-SSLC secondary schools.

Finding 31: Non-SSLC secondary teachers reported higher levels of critical literacy than SSLC secondary teachers.

Finding 32: Non-SSLC secondary teachers reported higher levels of focus on classroom management than SSLC secondary teachers.

Finding 33: Percentage of Indigenous students had a significant impact on community/Indigenous, and classroom management.

Finding 34: There were no differences between SSLC and non-SSLC leaders' reports on pedagogical approaches, except in the areas of vocational education, with trending differences in community/ Indigenous.

Finding 35: The overall mean on language was low in both SSLC and non-SSLC schools, indicating that the use and teaching of Indigenous languages

Finding 36: SSLC school leaders reported higher levels of vocational pedagogy than non-SSLC school leaders.

Finding 37: Leaders of schools with higher % of Indigenous students reported higher levels of conventional pedagogies.

Finding 38: Leaders of primary schools reported higher levels of conventional pedagogies than leaders of secondary schools.

Finding 39: Leaders from metropolitan schools reported higher use of progressive strategies in their schools compared to leaders from non metropolitan schools.

Finding 40: Leaders of primary schools were more likely to report higher levels of progressive pedagogies than leaders of secondary schools.

Finding 41: Leaders of schools with higher percentages of Indigenous students reported higher levels of community/ Indigenous pedagogies.

Finding 42: Leaders of primary schools reported higher levels of community/ Indigenous pedagogies than leaders of secondary schools.

Finding 43: Leaders of SSLC schools were more likely to report higher levels of community/Indigenous pedagogies than leaders of non-SSLC schools.

Finding 44: Leaders of primary schools reported higher levels of school subject pedagogies than leaders of secondary schools.

Finding 45: Leaders of SSLC schools were more likely to report higher levels of school subject pedagogies than leaders of non-SSLC schools.

Finding 46: Leaders of non metro schools were more likely to report higher levels of school subjects pedagogies than leaders of metro schools.

Finding 47: Leaders of secondary schools reported higher levels of vocational pedagogies than leaders of primary schools.

Finding 48: Leaders of secondary schools reported higher levels of vocational pedagogies than leaders of primary schools.

Finding 49: Leaders of SSLC schools reported higher levels of vocational pedagogies than leaders of non-SSLC schools.

Finding 50: Leaders of schools with a higher percentage of Indigenous students reported higher levels of vocational pedagogies.

Finding 51: As of 2010 there is no evidence that SSLC membership has any effect on school attendance.

Finding 52: As of 2010 there is no evidence that SSLC membership leads to greater increases in the rate of improvement in school attendance over time.

Finding 53: As of 2010 there is no evidence that SSLC membership leads to improved student achievement in reading, numeracy or writing.

4.2 Analysis and Discussion

In an analysis of Ontario's successful reforms of the last decade, Ben Levin, former Ontario Deputy Minister of Education and leading policy researcher, observes:

> Just creating learning communities … is not enough. Structures are also needed to make these communities real and to ensure they do the intended work of instructional improvement. The main danger to learning communities is that they fail to focus on working steadily to improve daily teaching practices. It's very easy for a "learning community" to pay attention to everything but the real work of looking at an improving everyone's daily instructional practices. … Real improvement through learning communities means spending time on things like student assessment practices, organization of lessons, common reviews of student work, and other real practices. (Levin, 2008, p. 127).

School reform is a means to an end: the overarching question of this evaluation report is the degree to which SSLC addresses the goals of the *National Aboriginal and Torres Strait Islander Policy*. These are, specifically, a closure of the gap in attendance and achievement between Indigenous and non-Indigenous cohorts of students, and improved pathway participation and outcomes for Indigenous students.

The research found no effects of SSLC on the improvement of school-level student outcomes at this stage in its development. We acknowledge that SSLC is at an early stage in its development – 21 months since its inception - to yield evidence of such effects. But the research also found no evidence of SSLC effects on systematic change or alteration of what Levin above refers to as “daily instructional practices”.

To analyse its progress to date and to recommend particular directions for its further development requires that we return to the SSLC program ‘logic’. We then can examine closely where it has made gains, where it has run into structural and systemic impediments, and possible forward directions to address the issues around student outcomes.

SSLC begins from a base treatment, a training program (SSLP) that focuses on changing individual school leaders’ dispositions and beliefs. SSLP is a catalyst for leaders to step up and take responsibility for improved outcomes for Indigenous students. The “tool box” or “dilly bag” provided to SSLP participants provides strategies to support these interactional and relational shifts after school leaders return to their schools and communities. It provides no programmatic advice for systematic reform of curriculum and pedagogy. The Stronger Smarter Institute makes these elements the domain of SSLC. Accordingly, the qualitative case studies presented in Part 2 here demonstrate that a common first step for SSLC Hubs is an attempt to change the general school climate or ethos: to change the discourses and culture of the school and its relations to Indigenous students and communities.

These initial moves raise several important questions for further analysis:

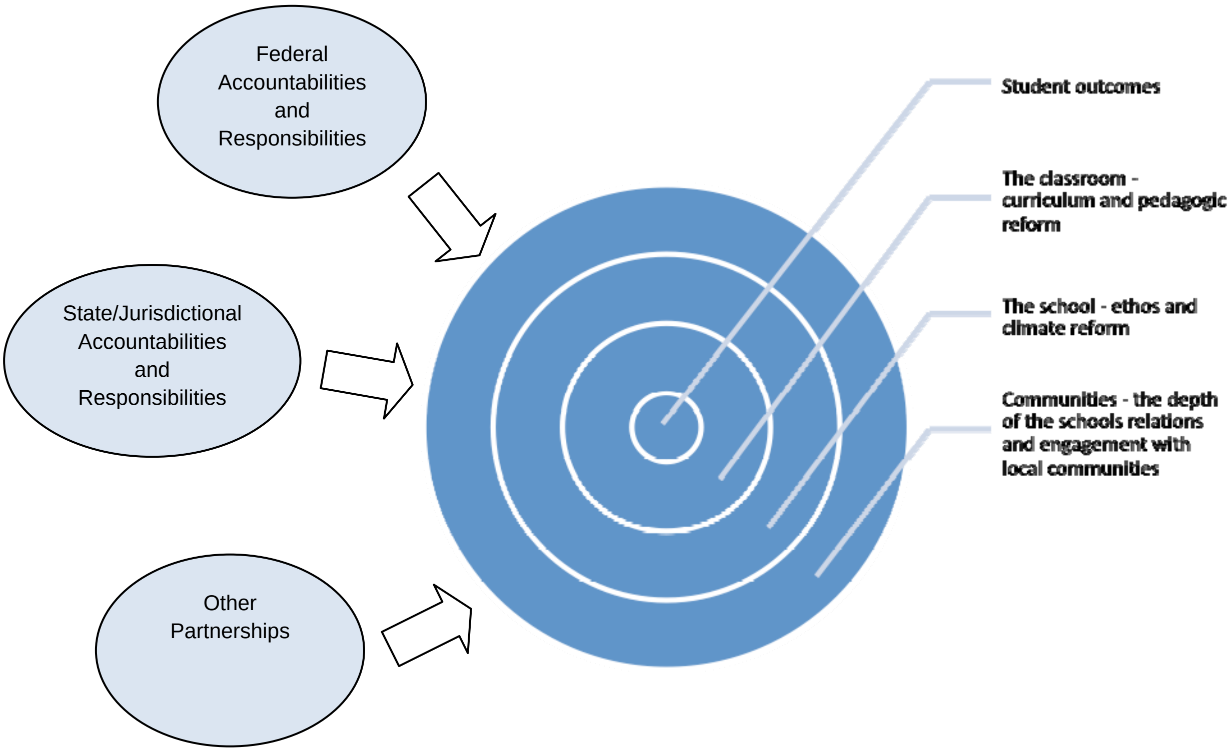
- First, do changes in school ethos lead to systematic efforts to develop or improve classroom curriculum and instruction, teaching and learning?

- Second, does community engagement lead to substantive Indigenous input into the governance of the school?

Both of these questions are about the depth of reform. That is, they are about the extent to which a reframing or rebadging of the school’s official discourse leads to substantive changes in the core businesses of classroom teaching and learning.

Figure 2 below represents these questions diagrammatically. It is based on the Wisconsin CORS model of school reform (Newmann & Associates, 1996):

Figure 2: Reform of Hub and Affiliate Schools



The concentric circles on the right of the model are a nested model of reform, with community relations providing the context for changed school ethos/climate. This in turn provides the context for changing the enacted curriculum in classrooms which, empirically, can be demonstrated as a necessary condition for improved student outcomes. To the left of the diagram are the specific external networks and institutional accountabilities that enable and constrain, steer and influence the school's efforts.

We began this report by asking overall research questions about the utility, efficacy, durability and sustainability of SSLC – and, by affiliation, Stronger Smarter messages communicated through SSLP – on school reform aiming for the improvement of student outcomes. We used qualitative and quantitative instrumentation to document how school leaders and teachers in SSLC Hub and Affiliate schools interpret and utilize the key Stronger Smarter messages, and to begin documenting both observed and self-reported changes in operational practice at the school and classroom that teachers and leaders reported were underway.

The qualitative field work on seven Phase 1 Hubs provides an overview of the diversity of uptake of Stronger Smarter messages, and the specific contextual challenges, constraints, impediments and enabling circumstances. We used case study narrative to study the range of reform underway in SSLC: from those schools where there is little impact of Stronger Smarter messages; to those schools who are in the early stages of changes in school philosophy, operations and administration; to schools that have used the Stronger Smarter messages as an umbrella for unifying and integrating strategies that have generated improved student outcomes.

The composite case analysis offered two further hypotheses about the reform process. First, reform is likely to require an extended tenure of an effective reforming principal – in the range of 4-6 years - to generate substantive change in student outcomes that have any possibility of sustainability. By this account, the current principal transfer system is a deterrent to scalable and sustainable reform.

Second, the analysis also suggests that any substantive change in conventionally measured student outcomes requires that "high expectations leadership" be translated into systematic, scaffolded reform of classroom pedagogy and curriculum. Simply, this is corroborated in every major study of school reform in the last two decades in the US, UK, Canada, New Zealand and Australia.

The current state of SSLC reform was detailed further in the survey data. The leaders and teachers at work in SSLC schools do not differ substantively in age, experience, qualification or training from non-SSLC schools. The leaders are, generally speaking, highly experienced. Clearly, the transfer system seems be an impediment to continuity of leadership required for reform, with only a third of principals in schools for five years and most moving to at least two positions over a five year period.

However, the teacher sample here is more experienced, less mobile and transient than anecdotal reports about those teaching in Indigenous contexts suggests. Specifically, only a quarter of the respondents in SSLC and non-SSLC schools were new or recent graduates with less than 3 years experience, with the vast majority having extensive prior experience in schools with Indigenous students.

At the same time, they report a general lack of sufficient in-service training – with less than a third of the teaching workforce having specifically targeted programs or training on elements of Indigenous education. Here, SSLC appears to be making a difference, with almost 80% of those who said they had received recent training coming from Hub or Affiliate schools. At the same time, a majority of this sample (71%) viewed their teacher preparation as inadequate for teaching in Indigenous education contexts.

In terms of the uptake of Stronger Smarter messages – there were several positive trends. Teachers in SSLC schools reported higher levels of Indigenous School Ethos, School Community Engagement, High Expectations Leadership, High Expectations Leadership Enactment in their schools than non-SSLC teachers. SSLC leaders reported higher levels of School Governance and Community, School Community Engagement, Indigenous Leadership (Roles) and Innovative School Modelling in their schools than non-SSLC leaders.

Differences were also explained by overall percentage of Indigenous students enrolled in the school. That is, it appears that key messages about School Governance and Community, Indigenous Leadership (Teaching), Indigenous Leadership (Roles), Innovative School Staffing and Innovative School Modelling had greater traction in schools with high percentages of Indigenous students. This is an altogether intuitive finding. There were as well Primary and Secondary School differences in the uptake of key messages (e.g., High Expectations Leadership, Indigenous School Ethos) and, as could be expected, in self-reports of current pedagogy/curriculum approaches.

These differences between school types and populations may have implications for how SSLC prioritizes and targets future school support, in-service and reform messages. Differentiated forums and in-service for primary and secondary, for schools with lower and higher percentages of Indigenous students may enhance the effectiveness of SSLC, especially if it turns to address the challenge of improving “daily instructional practice”.

In summary, the survey data offers a contrasting picture of SSLC and non-SSLC schools, where core messages from SSLP and SSLC are leading to self-reported changes in school governance and school ethos. By this account, SSLC schools are attempting to institute reform in areas identified in Stronger Smarter messages.

However, in the key area of pedagogy and curriculum, we found few substantive differences between SSLC and non-SSLC principals' and teachers' self-reports of practice. The self-reported differences were minor: with non-SSLC secondary teachers reporting a stronger emphasis on critical literacy and a stronger focus on classroom management than SSLC secondary teachers. Perhaps the only key finding, illustrated in the qualitative cases, was that SSLC school leaders reported a stronger emphasis on Vocational education and moves to engage with community/Indigenous practices in classrooms. These areas will be investigated further in 2012 – as the research team focuses on documenting and tracking change in classroom practices.

The overall picture of teaching is interesting: SSLC and non-SSLC teachers and leaders reported strong orientations towards conventional instruction, basic skills and the KLAs. Overall engagement with Indigenous language issues as instructional medium and curriculum content is low for both SSLC and non-SSLC schools.

There were, then, some significant, but isolated differences in teachers' and leaders' reports of SSLC and non-SSLC classroom practices (e.g., critical literacy in secondary schools, vocational education, community/Indigenous approaches).

However, on balance, we surmise that there were, at this juncture of SSLC development, no major or consistent patterns of differences in pedagogy and curriculum between SSLC and non-SSLC schools.

The systemic data analysis, further, shows that at the school level there are no statistically significant gain-score differences between SSLC and their ACARA like-school counterparts in achievement and attendance at this stage in the research.

Some SSLC schools are generating achievement gains, but these are outliers in the quantitative analysis. Further, on the basis of the qualitative case descriptions, it would appear that this is affiliated with the adoption of a systematic reform of curriculum and pedagogy. We will be exploring this further in 2012. While this reform is being undertaken under the Stronger Smarter umbrella, it is not based on SSLC content, or a mandate or requirement. In effect, any achievement or attendance gains attributable to changes in classroom practice in the SSLC network are arbitrary effects; that is, they are idiosyncratic, often educationally sound, choices of practice by quality school leaders. They are not effects of SSLC membership or SSLP messages.

It is, of course, early days in the story of the Stronger Smarter reforms. Contrary to policies that demand test score gains in short periods of time – school reform requires time. At this stage, we have posited a 4-6 year cycle as necessary for durable and sustainable reforms. By the 2012 report, some Hubs will be completing their third year under the SSLC banner.

Stronger Smarter reforms are reportedly succeeding in changing the ethos of many SSLC schools. Community engagement, development of school cultures built around discourses of high expectations, increased Indigenous staffing, and an exploration of innovative school operations and staffing is occurring in many of the case study schools visited. But at this point, there is little evidence that this version of "high expectations leadership" (Sarra, 2005) is systematically translating into classroom reform. In 2012, the research team will be empirically studying the relations of necessity and sufficiency between changes in school ethos, altered Indigenous community/school relations, changes in curriculum/pedagogy, and improved student outcomes. These relations will be key to answering research question (4), and offering summative evaluation of the scalability and sustainability of SSLC.

When queried about curriculum and pedagogy, SSLC and SSLP staff have repeatedly stated that "one size doesn't fit all", referring to the diversity of local contexts of Stronger Smarter schools. Therefore they do not advocate, recommend or mandate any specific curricular or pedagogy approach. Certainly, the case studies here demonstrated the diversity of educational contexts and their various impediments and enabling conditions for reform. But to date, they suggest that *only* when and where Stronger Smarter is linked to specific and well-founded curriculum change, can improved outcomes occur. Hence to say "one size doesn't fit all" does not mean that some specific models of curriculum/pedagogy cannot be linked to improved outcomes. It does not mean that "no size fits anything" or that "high expectations leadership" will generate improvement regardless of teaching/learning practices in classrooms. Further, we note that there is a burgeoning literature on teaching and learning in Indigenous contexts available (e.g., Purdie, Milgate & Bell, 2011) and an extensive literature on building school networks that articulate into the reform of classroom practice (Stoll, Bolam, McMahon, Thomas, Wallace, Greenwood & Hawkey, 2006).

There are a range of issues for SSLC raised by established criteria for effective inter and intra-school professional learning communities (e.g., Stoll, Bolam, McMahon, Wallace & Thomas, 2006). To date, there is evidence that SSLP and SSLC have met several key criteria, including: generating individuals' positive orientation to change, and developing relations of trust and common focus amongst SSLC leaders. But the challenges include: generating a range of activities where SSLC teachers can meet and learn from each other;

interacting with and drawing upon external relations; and, as the quote from Levin (2008) suggested, setting the programmatic and on-the-ground conditions for change in classroom practice.

The challenge for SSLC is to identify models of curriculum/pedagogy that can be empirically demonstrated to improve student outcomes and to encourage the generalization and adoption of these models in similar or comparable school contexts. This is, in fact, the core of network models used by the Ontario Literacy and Numeracy Secretariat (Levin, 2008) and other systems that, similarly, understand the problems and collateral damage that can be caused by universal curriculum/pedagogy mandates, particularly in Indigenous education.

Undertaken for the New Zealand government, Robinson, Hohepa and Lloyd's (2009) "best evidence synthesis" analysis of effective school leadership set the international benchmark for analysis of the role of the principal in improving student outcomes. In a meta-analysis of peer refereed studies, Robinson et al. concluded that there was no evidence that "transformational leadership" enabled or generated improved student outcomes. Their finding was that outcomes effects were yielded by "instructional leadership" which focused upon and set enabling conditions for the systematic improvement of teaching and learning. In major US school reform studies over the past two decades, Newmann and Associates (1996), Elmore, Peterson and McCarthy (1996), and, most recently, Bryke, Sebring, Allensworth, Luppescu and Easton (2010) came to a similar conclusion: that changes in managerial structure, school ethos were insufficient to improve student outcomes for marginalized and at risk students. The Australian school reform literature makes similar claims (Angus, 2003; Ladwig, 2004). The consensus of the research on school reform is that what is required was systematic change in everyday classroom relations. Finally, it is worth noting that the prototypical study of how heightened teacher expectations can generate improved student achievement was entitled "Pygmalion in the *classroom*" [emphasis added] (Rosenthal & Jacobson, 1968/2003). To generate improved student outcomes, the research literature tells us, "High expectations leadership" needs to translate into high expectations curriculum and pedagogy (Rist, 1970). This is the key challenge for the Stronger Smarter reform agenda.

4.3. Research Questions and Overall Findings

We return to address each of our original research questions in turn:

How influential is school leaders' participation in the SSLP in generating and sustaining school reforms and community engagement in the SSLC hubs, and improved outcomes for Indigenous students?

> **SSLP messages are reportedly gaining traction in SSLC schools in the areas of high expectations leadership, Indigenous school ethos, community engagement, and innovative staffing and school reform. There is no school-level evidence of any systematic effects on pedagogy and curriculum or on student achievement and attendance.**

Do SSLC hubs across the national network have value-adding influence and impacts on their affiliated schools?

> **At this stage of SSLC development, Hubs are having no value-adding effects in attendance and achievement and there are no generalisable patterns of Hub to Affiliate effects.**

Do SSLC hubs and their affiliated schools function as learning communities with sustainable kinds and levels of community engagement?

> **SSLC Hubs reported higher levels of Indigenous community engagement across several domains than non-SSLC schools. These were not empirically affiliated to improved outcomes.**

What other systemic, community, cultural and linguistic, school, teacher, and classroom factors impact on school renewal and reform, community engagement and improved Indigenous student outcomes?

SSLC messages around Indigenous identity, culture and community engagement is reported to have stronger traction in schools with higher percentages of Indigenous students.

The limited duration of principals' tenures in the school appears to be a systemic impediment to sustainable reform and improved student outcomes.

Teachers sampled in SSLC and non-SSLC schools report that their training and preparation for Indigenous education is inadequate.

How scalable and sustainable is the Stronger Smarter approach to school renewal and reform in Indigenous education?

Because SSLC has only been in operation since September 2009, the research team will offer further data on this question in 2012 and 2013 reports.

To address these questions in 2012, the Research Team will augment current analyses and data sets with:

- a longitudinal and student/cohort level analysis of value-adding effects in attendance and achievement;

- a detailed, case-based analysis of Indigenous student, community member and teacher response to the reform initiative and issues around Indigenous education; and

- a detailed, qualitative description of curriculum/pedagogy in purposively selected SSLC hub schools and successful non-SSLC schools.

4.4. Recommendations

The research report concludes with specific recommendations for SSLC operations in 2011-2012.

- SSLC work with the Research Team to identify models of curriculum/pedagogy that are linked to evidence of improved student outcomes.
- SSLC prioritise focused activities, resources and strategies of regional support, professional development and exchange for schools, emphasizing the dispersion of models of curriculum/pedagogy that are linked to evidence on improved student outcomes.
- SSLC consider the development of differentiated network and school development strategies for schools with low and high % of Indigenous students.
- SSLC consider the development of differentiated primary, combined and secondary school reform strategies.
- SSLP reconsider the addition of components on curriculum-focused school leadership and on classroom teaching and learning.

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A FORMATIVE EVALUATION

OF

THE STRONGER SMARTER LEARNING COMMUNITIES PROJECT

2011 REPORT- APPENDICES

Prepared by the Core Research Team,

Faculty of Education

Queensland University of Technology

Submitted to

SSLC Project Committee, Queensland University of Technology, and
Department of Education, Employment and Workplace Relations, Canberra, ACT

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Appendix 2.2 Systemic Data Requested From Jurisdictions

The research design it is operationalised within the context of an overall mixed model, mixed method approach. The mixed model component allows complementary explanatory analysis of the data collected. The mixed method component allows quantitative non experimental relationships to be framed in the context of plausible hypotheses.

Variable framework, type, scope and depth of analysis were informed by the following research questions:

1) How influential is school leaders' participation in the SSSLP in generating and sustaining school reforms and community engagement in the SSLC hubs, and improved outcomes for Indigenous students?
2) Do SSLC hubs across the national network have value-adding influence and impacts on their affiliated schools?
3) Do SSLC hubs and their affiliated schools function as learning communities with sustainable kinds and levels of community engagement?
4) What other systemic, community, cultural and linguistic, school, teacher, and classroom factors impact on school renewal and reform, community engagement and improved Indigenous student outcomes?
5) How scalable and sustainable is the Stronger Smarter approach to school renewal and reform in Indigenous education?

Systemic data held in centralised repositories relevant to formulating answers to these questions was requested from the jurisdictions involved in hosting SSLC schools plus other Australian Government agencies. The jurisdictions contacted included Queensland (Qld), New South Wales (NSW), Victoria (Vic), Tasmania (Tas), South Australia (SA), Western Australia (WA) and the Northern Territory (NT). The Australian Capital Territory (ACT) was not contacted in this round of data collection as no SSLC schools were sited in that jurisdiction at that time. Federal agencies contacted included the Australian Curriculum, Assessment and Reporting Authority (ACARA) and Department of Education, Employment and Workplace Relations (DEEWR). Data was collected at two time points: 2009 and 2010.

All jurisdictions were able supply the data sets listed with the exception of NSW that declined on privacy issues.

Data requested

The hierarchical format of the data requested reflects the nature of the multi-level analysis to be conducted. Information was collected for SSLC and non-SSLC schools to be used in the comparative study.

Individual student level:

- Unique student identifier
- Gender
- Date of birth (or age)
- Indigenous (ATSI) status

- School attended
    - Centre ID
    - School name
    - Year level
    - Class ID (It was recognized class ID is problematic in secondary schools)
- Attendance data - (total days attended/total days possible * 100)
- Student disciplinary absences (SDA) over year – count (long, short suspensions, expulsion)
- Mobility – across 12 month period
- A-E data – semester 1 and semester 2 by subject
- NAPLAN –individual student report (individual score, national average, school average, bands, range of achievement for middle 60% students)
    - Reading
    - Writing
    - Spelling
    - Grammar
    - Punctuation
    - Numeracy

School level data:

- Centre ID
- School name
- District name or equivalent
- Region name or equivalent
- IRSED
- Attendance data at school level average
- Student disciplinary absences (SDA) – (long, short suspensions, expulsion) – aggregated at school level

The collection and aggregation of NAPLAN data was straight forward due to national standardisation of the storage and reporting format. There was less standardisation of storage and reporting protocols across jurisdictions with respect to other data types. In particular, this was the case for individual student attendance, mobility, disciplinary absences and A-E data. This data also displayed varying precision. Consequently aggregation of the data was done very carefully with consultation with representatives of the host collection agency.

School level data was also supplemented with information sourced from the My School website hosted and maintained by ACARA. Data included school sector, school type, year range, total enrolments, ICSEA value, total enrolments, % of Indigenous students enrolled, and student attendance rate. This data was used to generate demographic descriptive and fine tune the selection of matched non-SSLC schools for comparative studies.

A request (granted) was also made to ACARA to supply school level gain scores for NAPLAN Reading, Writing and Numeracy results as illustrated in the Student Gain graphs displayed on the My School web site. Data supplied included specifically the numeric mean, standard deviation, standard errors and number of matched students taking the NAPLAN tests.

Appendix 2.3 Ethics Process

Ethical clearances and permission to research in government sector schools has been granted by the University Human Research Ethics Committee (HREC) and the relevant systems in all States and Territories. Table 1 below provides a summary of all clearances awarded to date. As non-government schools take up positions in SSLC the appropriate clearances will be negotiated in order to enable research to occur in those sites.

Table 1: Summary of Ethical Clearances and Permissions awarded for the Evaluation Project to date.

Clearance	Date received	Date expiry	Comments
QUT HREC	19th March 2010	19th March 2014	The application is updated for variations as necessary Newcastle University Administrative Approval also submitted.
Queensland	19th April 2010	30th June 2013	
Victoria	29th May 2010	30th December 2013	
Northern Territory	17th June 2010	31st July 2013	
NSW	5th July 2010	5th July 2011	Extension granted to 31st July 2013
Western Australia	7th July 2010	31st July 2013	
Tasmania	11th August 2010	July 2013	
South Australia	11th August 2010	July 2013	
ACT	9 August 2010	July 2013	Provisional clearance granted in 2010. Full clearance granted on 1st July 2011
Northern Land Council	5 September 2011	9 September 2011	Research/Survey Permit as per protocols for visiting researchers Return visit may be required in 2012

Variations to the design of the Evaluation project, along with the addition of Evaluation team members have all been submitted to the appropriate authorities. As a result of each SSLC application round, new schools – Hub, Affiliate and Like - have also been added to the appropriate applications and approved by relevant authorities.

The approach to researching with Indigenous peoples taken in this report calls on the *Guidelines for Ethical Research in Indigenous Studies* put forward by the Australian Institute for Aboriginal and Torres Strait Islander Studies (AIATSIS) (available at http://www.aiatsis.gov.au/research/grants/grants.html) for guidance. The AIATSIS guidelines suggest that principles of ethical research with Indigenous peoples should consider the following key foundation concepts:

- Consultation, negotiation and mutual understanding;
- Respect, recognition and involvement; and
- Benefits, outcomes and agreement.

(AIATSIS, pp. 3-5)

Our approach is organised around these foundation concepts. Consideration is also given to the widely used National Health and Medical Research Council guidelines (available at http://www.nhmrc.gov.au/publications/synopses/e52syn.htm). Where applicable these will be related to the AIATSIS guidelines (See Appendix 1.3 for details of the Statement of Ethical Conduct for Researching with Indigenous community members, the parents or caregivers of Indigenous students and Indigenous students).

Consent processes

All individuals involved as participants in the Evaluation have provided informed and voluntary consent. All participants have received information about the project in the form of a Participant Information Sheet (provided online for survey participants). For those participants (teachers and leaders in schools) asked to complete surveys, completion of the survey instrument has been taken to be individual consent. This is clearly explicated for participants at the online survey site. In the case of data collected through interviews and other qualitative methods, participants have provided signed consent. Where language has had the potential to have implications for a participant's capacity to give informed consent when provided with English text, local liaison people have been used to ensure that the participants understand the consent process. While children under the age of eighteen have provided their consent to the researchers, permission from their parents has also been sought.

Appendix 2.4 2012 Complementary Study

Community Members' and Students' Views of Selected SSLC Hubs

Background: In the SSLC Project Implementation Plan, specific 'sub-studies' were listed as possible future components of the design. To date, the Core Research Design has deferred the collection of data on community members' views and Indigenous students' views of Stronger Smarter Learning Communities Hub Schools and Stronger Smarter messages beyond that collected via interviews at a small number of Hub school sites and as part of school leader and teacher surveys sent to Hub, Affiliate, and Like Schools. The IERG 2011 meeting called for a more extensive and more representative sampling of community and student views than that currently undertaken by the Research Team on short-duration (5-day), school-mediated field visits. It also stressed the need for Indigenous researchers to undertake the fieldwork with Indigenous Elders, parents and caregivers, students and teachers.

At this stage in the research – rather than proposing numerous 'sub-studies' – the Research Team, with the support of the Indigenous Education Reference Group (IERG) and the International Reference Group, proposes what we will provisionally refer to as a major "complementary study" to be conducted by a research team of IERG members and Research Evaluation Team members – principally Indigenous in composition.

Rationale for the Proposed Study: Following discussions with IERG and the International Reference Group in March 2011, several issues were tabled:

(1) The need for richer qualitative data on the impacts of SSLC on Indigenous community – specifically, through interviews and focus groups with Indigenous Elders, community members, parents and students; and
(2) The imperative that this data be gathered by and analysed through the perspectives of Indigenous researchers.

The proposed study would not be a 'sub-study' but a key study of medium scale, which would link into the Hub School Case Studies undertaken by the Research Evaluation Team in 2012. Following IERG and International Reference Group advice, these 2012 cases would concentrate on 'pockets of success' and 'excellence' (see Research Design Modifications, 2011). The findings will be part of the main Research Evaluation Report presented to the Project Committee.

Aims: The proposed study would have these general aims, to be negotiated and clarified by the Complementary Study Research team:
(1) To document and report on Indigenous community Elders' and parents' views on the Stronger Smarter Learning Communities Hub (or Like) school's engagement with the community;
(2) To document and report on the school's variable impacts on the community;
(3) To document and report on Indigenous students' educational experiences and relationships with the school, its operations and messages;
(4) To document and report on Indigenous students' aspirations, outcomes and pathways through and from the school;
(5) To document and report on Indigenous teachers' experiences and relationships inside the school and with community engagement initiatives

Complementary Study Research Team: Professor John Lester (University of Newcastle/Chair), Dr. Jean Phillips (Queensland University of Technology/Coordinator), Professor Allan Luke (Queensland University of Technology), Mr. Max Lenoy (James Cook University/IERG) and Ms. Lyn Nichols (James Cook University).

Time Line and Commencement Date: Complementary Study Research Team members are coordinating their research teams in September 2011 with the goal of carrying out the major data collection activities beginning in February 2012. Data analysis will begin in April 2012 with the goal of presenting preliminary analyses to the full Complementary Study Research Team in July 2012. These timelines are currently being negotiated, therefore may shift as agreement is reached around meeting obligations to the community through the research, and appropriate timing for site visits.

Sample: The proposed study would focus on eight of 10 SSLC Hub schools identified by the Research Evaluation Team for intensive case study research, plus two non-SSLC schools that have been selected for intensive case study between 2012-2013 by the Research Evaluation Team and Complementary Study Team from three schools nominated by IERG members (n=10). The eight SSLC Hub schools, include:

1) 100, QLD (2012)
2) 500, QLD (2012)
3) 1600, NSW (2012)
4) 1700, NSW (2012)
5) 3900, TAS (2013)
6) 3600, SA (2013)
7) 2400, WA (2013)
8) 2900, NT (2013)

The non-SSLC schools are:

9) 4200, QLD (2012)
10) 4300, NSW (2012)

With research capacity issues a concern, it was decided that since there are three New South Wales and three Queensland schools identified in the 10 SSLC Hub school group, the Complementary Study would only select two from each of these states.

The non-SSLC schools had to demonstrate both commitment to Aboriginal and Torres Strait Islander education and achievement gains while drawing upon programs and approaches other than SSLC/SSLP (e.g., Dare to Lead). After reviewing ACARA My School profiles on nominated schools and discussing each school's demonstrated commitment and evidence of gains, two schools were selected as promising candidates: School 4200 in Queensland and school 4300 in NSW. The principal of school 4200 has a background in Aboriginal Studies and an expressed commitment to community involvement; the school also has a significant Indigenous student population (31% in 2010) and is located in a working class, suburban area making it an interesting case. School 4300 has showed gains from 2008-2010 compared to similar/like schools and participants in the Dare to Lead program.

Instruments and Procedures: All instruments will be developed by the proposed Complementary Study Research Team following cultural, linguistic and community protocols. An initial set of interview and focus group questions has been developed by the Complementary Study Research Team after reviewing existing Research Evaluation Team case research proforma, soliciting input from senior Indigenous researchers, and reflecting on the goals of the Complementary Study. While a few questions ask participants to share their perspectives on SSLC, most ask participants to share their perspectives on schooling, educational success, and their experiences with school reform.

Procedures/Ethics: The Research Evaluation Team has submitted an ethics variation to Queensland University of Technology to ensure the Complementary Study research will be covered under the existing university and state approvals. Complementary Study Research Team members from each participating institution (e.g., James Cook University and the University of Newcastle) will secure internal university ethics approval at their institutions as required. All field work will be conducted by Indigenous research assistants and/or community researchers in a manner appropriate to community linguistic and cultural protocols.

Budget: Funding would be allocated in 2012 to be disbursed to regional universities to employ and/or buy out release time of Indigenous researchers and support travel and data analysis. A subsequent allocation would be negotiated for 2012/2013.

Appendix 2.5 Summary of Case Protocols Jan 2010-March 2011

Purpose: To discern the value of the SSLC project in the development of functioning learning communities across contexts.

Case Design

The case approach will enable the use of all qualitative and quantitative data at the hub level.

This design is structured to discern the value of the SSLC project at specific local sites in relation to the development of functioning learning communities over time. This process will enable the research to inform the development of the SSLC project from 2009 -2013.

The use of cases as sites for the research has several advantages and can serve a number of purposes. It allows the project team to:

- Study the SSLC project in context to provide an understanding of the range of factors which contribute to the project in the development of functioning learning communities;
- Understand of the uniqueness of each hub studied;
- Study changes and developments in the project within the cases. This allows for some notion of durability and sustainability within the project to be investigated.

Each case will include the following data sets:

Desk Collection of Data Related to:

Systemic Data: e.g., Student outcomes data

Context Data: e.g., Location; State, Region/ District; Sector: State/ Independent/ Catholic; Type of school: e.g., primary/ middle/ secondary; Size: staff, specialist staff, students etc; SSLP: Who?, Why?, When?, Future Plans?, What?

Background Data: e.g., Descriptions school and school environment; school vision, values, mission, priorities; historical account of relations with the affiliated schools; community and cultural protocols in relation to school business e.g. communication and procedures to liaise with community; region/district level relations, processes and procedures

Demographic Data e.g., ABS Data; school demographic data eg SES, Indigenous population, ethnic/race, language/dialect, retention, transience, mobility, special needs categories, behaviour/ exclusion, short term suspensions, attendance (including cultural protocols eg attendance at funerals), truancy; funding data; school profile in relation to systemic programs; staffing profile; community engagement.

School-based Data Collection of Field-Visit Set:

Interviews / Focus groups (see protocols below)

- Principals' and School Leaders' Interviews

- Staff involved in teaching Interviews (e.g. teachers, teacher aides, IEWs)
- Community Members Focus Group / Interview
- Student Focus Group / Interview

Documents (see list below)

e.g., School annual reports; school curriculum programmes; school policy on Indigenous Education; school policies and practices manuals e.g. the welfare policy; teacher programmes of work; examples of teacher pedagogy and classroom assessment practices; P & F annual reports; staff, student, parent approval survey (a full list will be negotiated at the time of the visit)

Documents to be collected during field visits:

- Details of staffing, class lists and timetabling, non contact time and playground duty rosters;
- School annual reports (current and one year previous) and Annual Operational Plan;
- Documents related to National Partnerships Scheme as appropriate (Annual Planning);
- School curriculum programmes/ whole school programmes/syllabus;
- School policies related to Indigenous Education eg welfare, achievement targets, attendance, discipline, suspension; presence and membership of an ATSI Education committee; etc.
- School policies and practices manuals relevant to Indigenous priorities;
- Parent enrolment packs;
- P & F current annual reports;
- Results from staff, student, parent approval surveys (this may already be within Annual Reports);
- Newsletters (past 12 months) and other relevant communication/documents with parents and community;
- Any other documents that you believe represent the school’s approach to Indigenous education and community engagement.

During field visits the collection of other documents such as the following may also be negotiated:

- Teacher programmes of work;
- Examples of teacher pedagogy and classroom assessment practices;
- Photographs of learning spaces and school environment in particular we would be interested in any Indigenous welcome signs, art work, murals, posters.

Interview Protocols (for Phase 1)

Principals' and School Leaders' Interviews

When talking with Indigenous people the substitution of the term 'Indigenous' with a local group name, or with Aboriginal or Torres Strait Islander as appropriate should occur.

Language should be adjusted to be locally appropriate. Where appropriate a local, known person who can help to ensure the participant understands the questions will be enlisted.

Content of Interviews:

Interview 1

Content will include:

<u>Demographic data</u>

- Details of your training/background particularly Indigenous qualifications and programs
- Details of history of teaching/ educational leadership
- Details of experience of working with Indigenous communities/students
- How long have you been leader/principal of this school?
- How did you come to be leader/principal of this school?
- What would you describe as the most positive aspect of being at this school?
- What are the key challenges of being at this school and working in this community?
- How long do you anticipate staying at this school?
- Have you/How long have you worked in schools with a significant Indigenous student population?

<u>Involvement in SSI, SSLP & SSLC</u>

- When and where did you connect with SSI?
- What has been your continuing involvement with the SSI?
- What do you think are the outcomes for your school and the community from your links with SSI?

<u>Details of your participation in SSLP?</u>

- When did you attend SSLP?
- What has been your continuing involvement with the other participants in your SSLP?
- What influence did participating in the SSLP have on you as a leader in your school?
- Describe how your participation in SSLP has articulated to other members of the school and the community.
- What do you think were the outcomes for you personally and professionally from attending SSLP?

- Have others from the school and/or the community attended SSLP?
- Describe the influence or your participation in SSLP on your school and the community.
- What changes and new priorities have been introduced in relation to: school development and reform; community engagement; and improved outcomes for Indigenous students as a result of your participation in SSLP?

Details of your school becoming involved in SSLC?

- Describe the process of how you became involved in SSLC.
- What were the priorities that formed the basis of your SSLC application?
- What evidence did you call on when making decisions about the priorities of your SSLC reform process?
- Describe how you came to decide on these priorities
- Describe your SSLC network.
- What was it that interested you about the SSLC project?
- What do you anticipate will be the benefits from participating in the SSLC project?
- What do you anticipate will be the road blocks to the success of the SSLC project for your school and network?
- What are the major supports for the implementation of these changes and priorities?
- What are the major constraints to the implementation of these changes and priorities?
- What succession plans do you have in place for the SSLC renewal and reform initiatives?
- What do you use Stronger Smarter (your engagement/involvement in SSLC) for? What does it do for your school?

Current school context (these questions will be shaped based on our analysis of the documents collected)

Describe the current context of your school in terms of:

- Location;
- community engagement;
- staffing and related issues;
- Indigenous students and their background;
- Indigenous students and their community;
- Indigenous student outcomes;
- Teaching and learning in the school;
- Teaching and learning of Indigenous students in the school;
- Involvement of Indigenous parents and care givers in school and student activities;
- Prior relations with affiliated schools;
- Relations with other schools within other networks;

- Descriptions of programs that the school is involved with and relevant funding relationships;
- Changes in curriculum focus; and
- Commitment levels of staff to SSLC program.

Interview 2

Promoting, Supporting and Acknowledging Strong Indigenous Identity

<u>How would you define or understand Indigenous identity?</u>

- Is it important for Indigenous students to develop a strong Indigenous identity? If so, why so?
- Do you have a role in promoting, supporting and acknowledging Indigenous identity at your school? If so how would you describe this role?
- What actions do you take to support strong Indigenous identity in student/s,? In staff? In community?
- How do you support your teaching staff in their attempts to promote strong Indigenous identity within your school?
- What helps you to support strong Indigenous identity amongst staff, students, and community members at your school?
- What are the roadblocks to supporting strong Indigenous identity?
- What is the relationship between your SSLC priorities and activities and the support and acknowledgment of a strong Indigenous identity?

Indigenous Leadership

- How do you define or understand Indigenous leadership in your context?
- Is Indigenous leadership an important part of Indigenous education? If so, why so?
- Do you have a role in promoting Indigenous leadership within your school? If so, how would you describe this role?
- What actions do you take to support Indigenous leadership in student/s? In staff? In community?
- What is your role in supporting/ promoting strong Indigenous leadership amongst the staff at your school?
- What is your role in promoting strong Indigenous leadership in community?
- What actions do you take to promote strong Indigenous leadership in student/s, in staff and in community?
- What helps you to promote Indigenous leadership?
- What are the roadblocks to promoting Indigenous leadership?
- What is the relationship between your SSLC priorities and activities and the promotion of a strong Indigenous leadership?

High Expectations

- How do you define or understand High Expectations for Indigenous students?
- Are High Expectations important for Indigenous education? If so, why so?

- Do you have a role in promoting high expectations for Indigenous students? If so, how would you describe this role?
- What actions do you take to communicate high expectations for Indigenous students to students themselves? Amongst staff? And within the community?
- What helps you to promote High Expectations for Indigenous students?
- What are the roadblocks to promoting High Expectations for Indigenous students?
- What is the relationship between your SSLC priorities and activities and the promotion of High Expectations for Indigenous students?
- Where do students go when they leave/transition from your school?

Dynamic Models of Staffing

- Describe your understanding of the concept of Dynamic Models of Staffing.
- Are dynamic models of staffing important for Indigenous education? If so, why so?
- Do you have a vision of an innovative model of staffing that would support improved outcomes for Indigenous students in a community such as this?
- What is the relationship between your SSLC priorities and activities and the promotion and implementation of Dynamic Models of Staffing?
- What actions have you taken to promote Dynamic Models of Staffing in your school and the SSLC network?
- What actions have you taken to implement Dynamic Models of Staffing in your school and the SSLC network?
- How do these actions relate to Indigenous staff at your school?
- What helps to promote and implement Dynamic Models of Staffing in your school?
- What are the roadblocks to implementing dynamic models of staffing at this school?
- If you had a magic wand how would you change the staffing model at this school to improve outcomes for Indigenous students in a community such as this?

Dynamic Models of Schooling

- Describe your understanding of the concept of Dynamic Models of Schooling.
- Are Dynamic Models of Schooling important for Indigenous education? If so, why so?
- Do you have a vision of a model of schooling that would support improved outcomes for Indigenous students in a community such as this?
- What is the relationship between your SSLC priorities and activities and the promotion and implementation of Dynamic Models of Schooling?
- What actions have you taken to promote Dynamic Models of Schooling in your school and the SSLC network?
- What actions have you taken to implement Dynamic Models of Schooling in your school and the SSLC network?
- What helps to promote and implement Dynamic Models of Schooling in this community?

- What are the roadblocks to promoting and implementing Dynamic Models of Schooling in this community?
- If you had a magic wand how would you change the staffing model at this school to improve outcomes for Indigenous students in a community such as this?

General

- What do you consider when looking for evidence of improved outcomes for Indigenous students?
- What are your targets for improving outcomes for Indigenous students?
- How do these relate to your targets generally? Why?
- What works well at this school in your pursuit to improve outcomes for Indigenous students?
- If you had a magic wand what would you change in the school and/or its environments?
- Do you have other comments that you would like to add?

Interviews of Staff involved in Teaching at the school (i.e. teachers, Aboriginal Education Workers, teacher aides, specialist teachers etc.)
When talking with Indigenous people the substitution of the term 'Indigenous' with a local group name, or with Aboriginal or Torres Strait Islander as appropriate should occur.

Language should be adjusted to be locally appropriate. Where appropriate a local, known person who can help to ensure the participant understands the questions will be enlisted.

Documents

We may request examples of the following documents if this is appropriate and agreeable to the individual participant:

- Teacher programmes of work;
- Examples of teacher pedagogy and classroom assessment practices (eg student work samples); and
- Photographs of learning spaces and classroom environment.

Content of Interviews

Demographic data

Details of your training/background such as specific qualifications or training in Indigenous education outside SSI eg Diploma Indigenous Ed as well as other quals/training:

- Details of history of teaching
- Details of experience of working with Indigenous communities/students
- How long have you been involved in teaching at this school?
- How did you come to be teaching at this school?
- What would you describe as the most positive aspect of being at this school?

- What are the key challenges of being at this school and working in this community?
- How long do you anticipate staying at this school?

<u>Involvement in SSI, SSLP & SSLC</u>

Have you been a participant in SSLP or other SSI programs/events and describe this involvement?

- What do you think the outcomes for you personally and professionally have been as a result of your participation in these activities?
- What do you think the outcomes for you personally and professionally have been as a result of your participation in other SSI programs/events?
- Describe your understanding of the Stronger Smarter messages?
- What do you think are the outcomes for your teaching and for your school and the community from the school's links with SSI?
- Describe the uptake of SSLC in your school and the community.
- Describe your SSLC network.
- What influence has the SSLC had on you as a teacher in your school?
- What changes and new priorities have been introduced in relation to:
- school development including curriculum and teaching practice
- community engagement; and
- improved outcomes for Indigenous students
- as a result of participation in SSLC?
- Have there been any recent developments in your school related to supporting a strong Indigenous identity?
- What do you anticipate will be the benefits from the SSLC project?
- What do you anticipate will be the road blocks to the success of the SSLC project for your school and network?

<u>Current school context</u>

Describe the current context of your school in terms of:

- Location;
- community engagement;
- Indigenous students and their background;
- Indigenous students and their community;
- Indigenous student outcomes;
- teaching and learning in the school;
- Teaching and learning of Indigenous students in the school;
- Involvement of Indigenous parents and care givers in school and student activities
- relations with affiliated schools;
- relations with other schools within other networks; and
- Commitment of staff to SSLC?

Interview 2

Pedagogy

- How would you describe your pedagogical approach for improving Indigenous student educational outcomes?
- How would you describe pedagogical practice that enhances Indigenous student educational outcomes?
- Have you made changes to your pedagogy to improve Indigenous student educational outcomes?
- Are there certain emphases in your repertoire of pedagogical practices that you think are more aligned to the goal of improved outcomes for Indigenous student educational outcomes?
- Are there particular pedagogical practices that you see as more relevant for teaching Indigenous students to improve their educational outcomes?
- How do you think you could improve your pedagogy to achieve improved educational outcomes for Indigenous students?
- What are the major constraints to developing your pedagogical teaching practice for improved outcomes for Indigenous students?
- What support do you think would help you develop and enhance your pedagogical practice to improve outcomes for Indigenous students?
- What kinds of knowledge, supports, and resources inform your work with Indigenous students?
- In thinking about your work with Indigenous students, what kinds of roles are you preparing them for?

Networking

- Who do you seek advice from in relation to improving Indigenous student educational outcomes?
- If you have a concern or issue related to Indigenous education, who do you go to for advice?
- Who do you give advice to in relation to improving Indigenous student educational outcomes?
- Are there colleagues who come to you for advice about Issues related to Indigenous education?
- Who else do you talk to other than those you seek advice from or give advice to about improving Indigenous student outcomes?
- What do you see as your strengths in developing and maintaining the networks involved in the SSLC?
- Who are the key players in your school driving reform in relation to improving Indigenous student educational outcomes?
- Could you describe the level of contact made with Indigenous community and their role in school decision making?

Promoting, Supporting and Acknowledging Strong Indigenous Identity

- How do you define or understand Indigenous identity?
- Is it important for Indigenous students to develop a strong Indigenous identity? If so, why so?

- Do you have a role in promoting, supporting and acknowledging Indigenous identity? If so how would you describe this role?

- What actions do you take to support strong Indigenous identity in student/s,?In staff? In community?
- How do you support staff in promoting strong Indigenous identity within your school?
- What is the relationship between your school's SSLC priorities and activities and the promotion, support and acknowledgement of a strong Indigenous identity?

Indigenous Leadership

- How do you define or understand Indigenous leadership?
- Is Indigenous leadership an important part of Indigenous education? If so, why so?

- Do you have a role in promoting Indigenous leadership? If so how would you describe this role?

- What actions do you take to promote Indigenous leadership in student/s,?In staff? In community?
- What helps you to promote strong Indigenous leadership?
- What are the roadblocks to promoting strong Indigenous leadership?
- What is the relationship between your school's SSLC priorities and activities and the promotion of a strong Indigenous leadership?

High Expectations

- How do you define or understand High Expectations for Indigenous students?
- Are High Expectations important for Indigenous education? If so, why so?
- Do you have a role in promoting high expectations for Indigenous students? If so, how would you describe this role?
- What actions do you take to communicate high expectations for Indigenous students to students themselves? Amongst staff? And within the community?
- What helps you to promote High Expectations for Indigenous students?
- What are the roadblocks to promoting High Expectations for Indigenous students?
- What is the relationship between the SSLC priorities and activities and the promotion of High Expectations for Indigenous students?
- Where do students go when they leave/transition from this school?

Dynamic Models of Staffing

- In this school are there examples of innovative ways of using staffing to improve outcomes for Indigenous students?
- Do you have any ideas of ways of using innovative staffing models that would support improved outcomes for Indigenous students in a community such as this?
- If you had a magic wand how would you change the staffing model to improve outcomes for Indigenous students in a community such as this?

Dynamic Models of Schooling

- Do you have any ideas of ways of using dynamic models of schooling that would support improved outcomes for Indigenous students in a community such as this?

Student Focus Groups

When talking with Indigenous people the substitution of the term 'Indigenous' with a local group name, or with Aboriginal or Torres Strait Islander as appropriate should occur.

Language should be adjusted to be locally appropriate. Where appropriate a local, known person who can help to ensure the participant understands the questions will be enlisted.

Documents

- Examples of student work.

Recruitment of respondents

- Initial interviewees to be nominated by the principal or school leader, AEW, community liaison worker, Elder, teacher on the basis of their participation in the school.

- Should aim to get a variety of students. As an example students could thus be selected in terms of their level of engagement in the school: chronic non-attenders; regular attenders; and high achieving students.

Interviews to be conducted preferably by/in the presence of someone who is familiar to the students.

Content of Interviews – (adjustment to language and names used to make relevant to school level as well as context and location will be required)

Content of Interviews

- What kind of school is this?
- What is this school about?

<u>Changes to the school priorities, curriculum, teaching, assessment</u>

- Have you seen any changes at the school in the last few years? (eg subjects offered),
- What is important to you and the teachers about this school?
- What is important to you and your parents about this school?

<u>How do you see the school in terms of the relationships with the community?</u>

- How does the school get on with people in the community? With your parents/caregivers?
- Does the school do anything special to make you and your family welcome?

- How would your mum/dad/carer react/feel if a teacher rang up or visited your house?

Students' views on what is functioning well within their community?

- What is really good about living here?
- If you had to tell a close friend about the best things about the community you live in what would they be?

Demographic data

- How long have you been a student at this school? Do/Did other members of your family and friends come to this school?
- Why are you at this school?
- What do you want to do when you finish school?
- What is the best thing about coming to this school?
- What happens at school that makes you feel good?
- What is good about being an Indigenous kid in this school?
- Is there anything else that you'd like to tell us about your school?
- What would a visitor to your classroom see when your teacher is teaching you?
- Do you get homework from school? If you do where and when do you do it?
- How often do you take time off school? Why do you take time off school?
- If you need to use a computer where do you go to use one?
- Do you like to read? What do you read? Do you have particular places where you like to read?
- If you had a magic wand what would you change about school to make it better for you?

High expectations

- How would you describe good work?
- What helps you do your best work at school?
- What are your favourite subjects at school and why are they your favourite subjects?
- Think of the best teachers you have had and tell me why they were the best for you?
- Is there anything else you'd like to tell us about your school work?

Community engagement

- Do you have any contact with anyone who works at the school outside of school?
- Does the community use the school grounds or facilities after school hours?
- Do your parents (care givers) ever come to school? Why? (eg to drop off and pick up? to talk to teachers? when student is in trouble? school planned activities? to help out?)
- Does anyone from the school visit your home? How often would they come? Why do they come to your home?
- Do things happen outside school hours that the school runs?
- Do things happen at the school outside school hours that the community runs?

Indigenous Outcomes

- What would you like to do once you leave school?
- What does your teacher/school do to help you achieve this?

- What does it mean to you to do good work?
- Why do you go to school?
- What are the best things about school?
- Why do you think Indigenous kids do well at school? At this school?
- What do you think about Indigenous kids who do well at school?

Indigenous Leadership

- If you had something really important that you needed to get advice on, who would you ask for this advice? Why would you go to them?
- If you had a problem at school who would you go and see?
- Who helps you most with your learning?
- Who do you think is an Indigenous leader*? Why?*
- Community Members Interviews and/or Focus Groups

When talking with Indigenous people the substitution of the term 'Indigenous' with a local group name, or with Aboriginal or Torres Strait Islander as appropriate should occur.

Language should be adjusted to be locally appropriate. Where appropriate a local, known person who can help to ensure the participant understands the questions will be enlisted.

Documents

Have you seen any newsletters or other material from the school?

If so,

- What?
- How many/ how often?
- What did you learn about the school from them?
- What did you learn about your kids from them?

Content of Interviews

Demographic data

Details of your background/Details of history of involvement/membership with/of the community.

Are you from around here?

- How long have you been here?
- Is there a local Indigenous group that meets with the school i.e. local consultative group, advisory group?
- Can you tell us about your community?

Details of experience of working with Indigenous communities/students

Have you done any paid or volunteered work with the kids at this school or other schools?

- In what way? [teacher aide, parent helper, tuck shop, maybe community garden, homework centre, also parent groups – P&C, ASSPA, Consultative Group]
- How long have you worked at the school/had children at the school?[children might include own children, grand children or children they are caring for]
- Why did you decide to work here? Or Why did you choose this school for your children?
- What is the best thing about being involved with this school?
- What is the best thing about this school?
- Is there anything else you'd like to tell us about the school?
-

Involvement in SSI, SSLP & SSLC

- Have you heard of the Stronger Smarter Program for Indigenous kids?
- Did you know this school was involved in the program?

Current school context

What do you know about the school: [choose those from the list below that make sense within the interview context?]

- history, background;
- community engagement;
- Indigenous students and their background;
- Indigenous students and their community;
- Indigenous student outcomes;
- teaching and learning in the school;
- teaching and learning of Indigenous students in the school;
- Involvement of Indigenous parents and care givers in school and student activities;
- What do you think a school's place is in supporting or providing a space for a strong Indigenous Identity?
- Is having a strong Indigenous identity important for Indigenous education? If so, why so? What role do you think the school should play in relation to this?
- What do you think having a strong Indigenous Leadership in a school means?
- Is Indigenous leadership in a school important for Indigenous education? If so, why so?
- What does 'educational success' mean for Indigenous students? What does the school do ensure this for students? What should they be doing? How is this different to, or the same as the role of parents and community?
- What's important for you for Indigenous Student Outcomes?
- What do you think it means to have High Expectations for the kids in your community, or at this school?
- Is having high expectations for Indigenous students important for their education? If so, why so?

- What do you think are the important things for schools to do to engage with you as a community member?
- If you had a magic wand what would you change about the school to involve you and other members of the community?

Appendix 2.6: Network Analysis of Hub School Leaders' Communications

Introduction

To describe the SSLC network communities, this report uses social network analysis of selected survey and interview data. By mapping the communication patterns of participants in the network, it demonstrates how collaboration as a potential resource is distributed. The aim is to describe models or patterns of Hub and Affiliate communications. This section maps selected communication flows between actors in the network and across groups in six Hub-Affiliate school clusters. The analysis describes and compares emerging typologies of local SSLC network structures.

Research Design & Research Questions:

The following questions serve as guides to the social network analyses:

> *What is the size of the local Hub+Affiliate network---the actors and their number of connections both actually reported as well as potentially possible?*
>
> *What type of ties, weak or strong, many or few, do actors have in the local network?*
>
> *What is the configuration of Hub and Affiliate connections to one another and to others outside of the local SSLC network?*
>
> *What is the strength of these reported communication ties across individuals and organizations?*

A subsample of SSLC hubs and their affiliate schools were analyzed. Hub school leaders were asked: "Who do you talk to about improving Indigenous student educational outcomes?" The survey asked individuals to nominate the persons they spoke to by role and organization. Other data was collected through follow-up phone calls to school leaders and, where possible, interviews conducted as part of the Hub field observation visits. The aim is to describe the network structure emerging in a subsample of local SSLC Hub networks (See Appendix # for Leaders' Survey Questionnaire).

Sample:

The sample reported here was six Hub+Affiliate school configurations. This represented 21 Hub and Affiliate schools across 25% of the Hub configurations. These schools are a cross-section of SSLC Hubs from various geographic locales, school configurations, and across two time periods, 2009 and 2010. The sites selected had adequate but not comprehensive data, including information from school leaders and from Affiliate schools. All data was collected in 2010. Table 2 lists the characteristics of Hub schools in the sample.

Table 2 Chararacteristics

Hub Schools	*Brief Description*
Hub- A	A secondary school in a satellite city to a State Capital. The school has just over 1000 students and 6% Indigenous students.
Hub - B	A regional secondary school. The school has just under 1000 students with just less than 15% Indigenous students.
Hub - C	A secondary school in a satellite city to a State Capital. The school has just over 700 students and 12% of these are Indigenous.
Hub - D	A primary school in a capital city. The school has over 350 students with 8% of those students identifying as Indigenous.
Hub - E	A secondary school in a satellite city to a State capital. The school has approximately 800 students and 12% of these students identify as Indigenous
Hub - F	A mid-sized primary school in a provincial city. Fifty eight percent of the school's almost two hundred students are Indigenous. There are 45% of the students who have English as a second language.

Research Methods

Basic network properties were analysed using statistical algorithms from the software UCINET (Borgatti, Everett & Freeman, 2002) and visualization graphics available in NetDraw (Borgatti, 2002). This analysis provided an initial view of the size of their local network, its connectedness of participants (i.e., network density), and preliminary measures of the centrality or the structural position of participant in the network. Data were then further analyzed to reveal participants' reports of the strength of these ties (based on number of times contact was initiated). These connection links were then analyzed for subgroup formations based on algorithms developed by UCINET (2002) to determine overlapping subgroup boundaries and specific regions where communication patterns appear to cluster.

In this analysis, egocentric data is used to determine the emerging network. This includes the individual participant's report of their network and data on the people they identify as part of their communication network. Participants are grouped according to the following attributes: their affiliation with a Hub school or Affiliates, their respective roles in those schools as a Principal or as a Teacher, HOD, Indigenous Education Worker, etc. Participants also identified contacts outside of the immediate school network, in regional education offices, community organizations, health and local agencies. In this case, the affiliations were aggregated to the following levels: (1) other schools in the Hub cluster; (2) 'Community', which refers to non-educational, non-school based actors in the network; (3) 'State/Regional' which refers to State Departments of education and their regional level offices; (4) 'SSI' which identifies any Stronger Smarter Institute staff member or other Hub schools. The strength of the ties between actors in the network was determined by calculating a scale based on how often individuals reported communicating with their elected others in a given month period. The range was from none or only 1 time per month to several times per week or even daily.

Patterns revealed differences in the size of various sampled networks and how their connections mapped both inside the local Hub+Affiliate structure as well as to outside structures (such as community and state entities). This also revealed characteristics about actors embedded in these networks, such as identifying key individuals as well as those more isolated in the overall network structure. Further patterns are based on participants' reports of the strength of these ties (i.e., number of times contact was initiated)

Analysing Different Hub Typologies

The following illustrations describe identified features of these local structures.

These typologies highlight differences or similarities in network structures. These include: length of time in the network, the density of the internal (or school-based) network connections including the role of the Affiliates; the reach of those connections to outside entities such as State Departments; SSI contacts in the Hub clusters; and the influence of local context on shaping the local network.

In each diagram presented below, the dots represent individuals in Hub schools (the Hub group is clustered in the center of the diagram), or in Affiliate schools (clustered around the Hub school configuration as satellite entities in the top, right or left of the diagram), or those in State, Community, SSI, or Other Schools (clustered at the bottom of the diagram). The lines connecting the dots represent communication patterns as reported by the participants. The thickness of the line and the size of the dot graphically indicate stronger ties (on the scale of few or no ties to often or daily ties).

THE NETWORK RELATIONS TEND TO EVOLVE IN DENSITY AND COMPLEXITY AS LENGTH OF TIME IN SSLC INCREASES.

- Hub-B in the Figure below has been in SSLC since its inception. This accounts for the more complex patterns of communication developed both within the Hub school (featured in the centre-left in the diagram), between the Hub and its Affiliates (featured in the right and top of the diagram), and beyond to outside entities (featured at the bottom of the diagram). In Hub-B, network ties are dispersed throughout the cluster. The pattern of these links represents a dispersion over the various entities involved in Indigenous education reform without an exclusive clustering or concentration in any one sector.

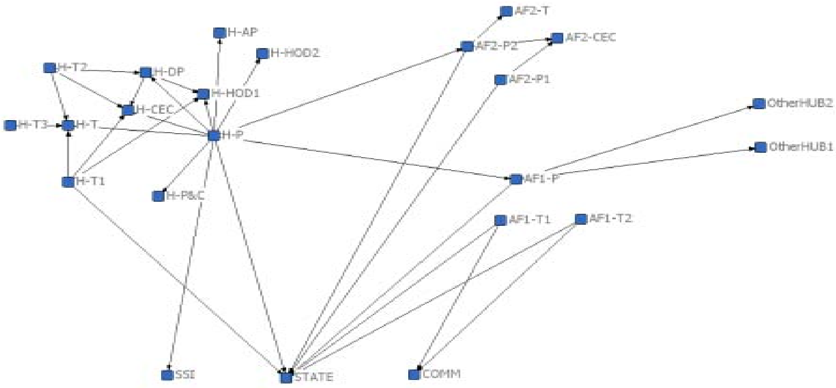


Figure 1 **Hub-B**

By contrast, Hub F (refer Figure 2) below is a 2011 SSLC entry. For new Hub clusters in the initial stages of development, two types of structures are evident and may be attributable to jurisdictional differences. There appears to be a stronger concentration of internal ties, with fewer ties to other external entities and no evidence of ties to their Affiliate schools. Hub F relied heavily on a key staff member in recent transition to a new leadership structure. Further, it is a provincial school with a high percentage of Indigenous students, in a state jurisdiction which does not provide centralised bureaurcratic support or infrastrucure.

In this Hub school, the network communication patterns resemble "star" networks where a few prominent individuals are at the center of information flows. With 18 observations and a total of 103 possible communication ties, this network utilizes 34% (s.d.1.11) of the available ties. They are the center of information and communication surrounding Indigenous student educational outcomes. A key teacher is centrally located in the network, followed by the Community Education Coordinator and the Principal. These three actors form a strong communication sub-group that is linked to other teachers and staff. All three report also speaking with State Department of Education, but they appear to be the only relays of that information back to the local school. While it does not have strong external links, this Hub has a strong internal communication structure spread over several individuals making it less vulnerable to disruption should one actor be removed.

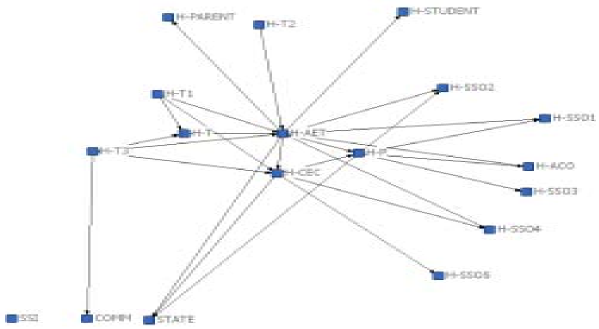


Figure 2 **Hub-F**

Hub D (refer figure 3 below) is also a new Hub. But it relies heavily on ties to outside entities (e.g., State Department) that are utilized by teachers and principals alike within both Hub and Affiliates. In addition, for this new Hub, the Affiliate schools appear to have the bulk of communication activity. These patterns may be attributable to the available of State departmental infrastructure and the ease of access to external links in a capital city metropolitan area, compared to the relative sociodemographic isolation of Hub F above.

This is a relatively "thin" or weak internal network where the majority of actors are not well connected to one another. They appear to be connected through one tie inside the network and one outside of the network to the State directly or indirectly. There are no "central" actors in this network, but several serve as conduits or brokers of information to actors on the periphery of the network structure. Overall, the density of this network is only 12% (s.d. .643) with 28 observations and a 96 possible ties.

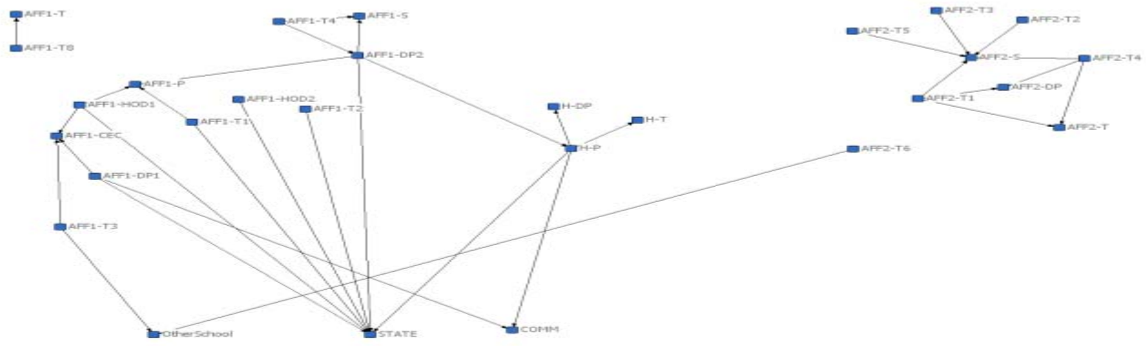


Figure 3 **Hub D**

COMMUNITY AND STATE ORGANISATIONS OUTSIDE OF SSLC ACT AS CENTRAL NODES IN NETWORKS.

In the case of Hub-E (refer Figure 4) a regional support group for Indigenous education is the communication hub for many actors. This has been separated out in the diagram from "State" and listed as IESS. For this Hub network, there are 30 observations with a total of 129 possible ties and a mean tie density of 14% (s.d. .704). 26 of the 30 actors reported that they talk with this regional support group about Indigenous education reform. As in Hub D (refer Figure 3) there is extensive communication to external entities. However, Hub-E has the beginnings of a more integrated network structure. Principals, the Community Education Coordinator, a HOC, a HOD and several teachers emerge as having many ties in this network. This network does not appear to be creating collaborative clusters. There is an Affiliate school that remains isolated from the rest of the Hub cluster. The Hub Principal is a key player for communication. However, the regional support group appears to have the broadest reach across all schools in the cluster.

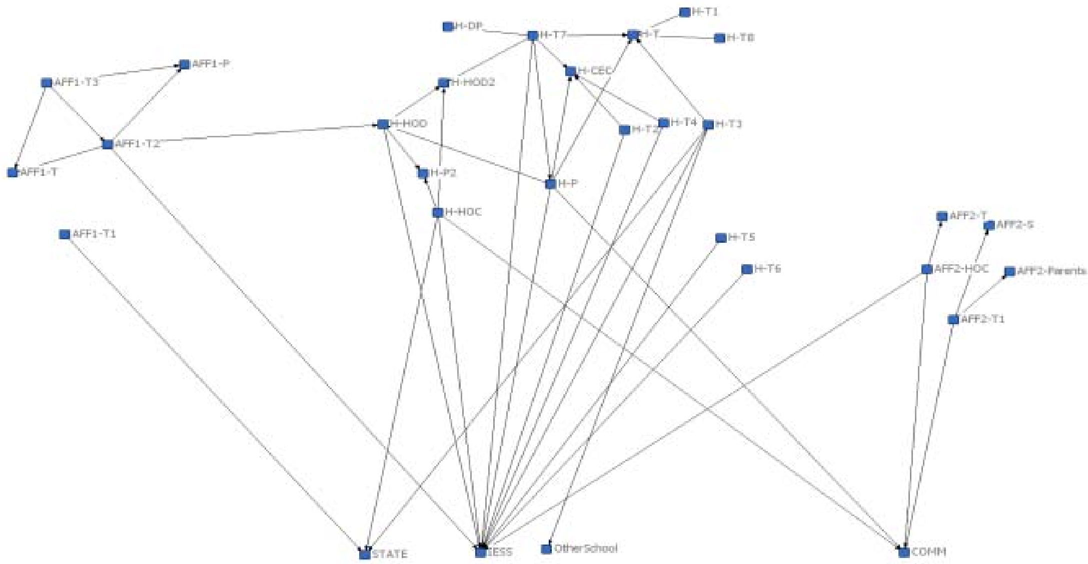


Figure 4 Hub-E

AS HUB CLUSTERS EXPAND, THEIR INTERNAL NETWORKS BECOME MORE DENSE AND AFFILIATES BECOME MORE ACTIVE IN COMMUNICATION FLOWS.

As Hub Clusters develop, there are emerging patterns of denser internal information flows within the Hub and Affiliate individual school communication structures. However, the communication between Hubs and their Affiliate schools is more mixed. Like Hub E above, the network of Hub-C (refer Figure 5) appears to disperse their connections more broadly across their local network with fewer actors having only one tie to the network. However, Hub-C (refer Figure 5) communication flows in the primary Hub show several emerging key actors who exchange information that disperses throughout the network. These key players are also communicating with each other in order to collaborate on this information, potentially providing a more coordinated approach to school reform. This is an example of distributed leadership, where the network is less dependent on a single leader's communications.

It should be noted that like Hub E (refer Figure 4) above, actors in Hub C (refer Figure 5) also reported communication with a regional Indigenous education advisory group. This regional support group received over a quarter of all communications from this network connecting across the full network with ties to each of the main actors in the schools. However, as noted, these actors in Hub-C (refer Figure 5) have begun to develop collaborative communication structures that help coordinate and disperse this information more efficiently across the network. This group has a total of 34 observations with a 120 possible ties and a network density of 11% (s.d. .540).

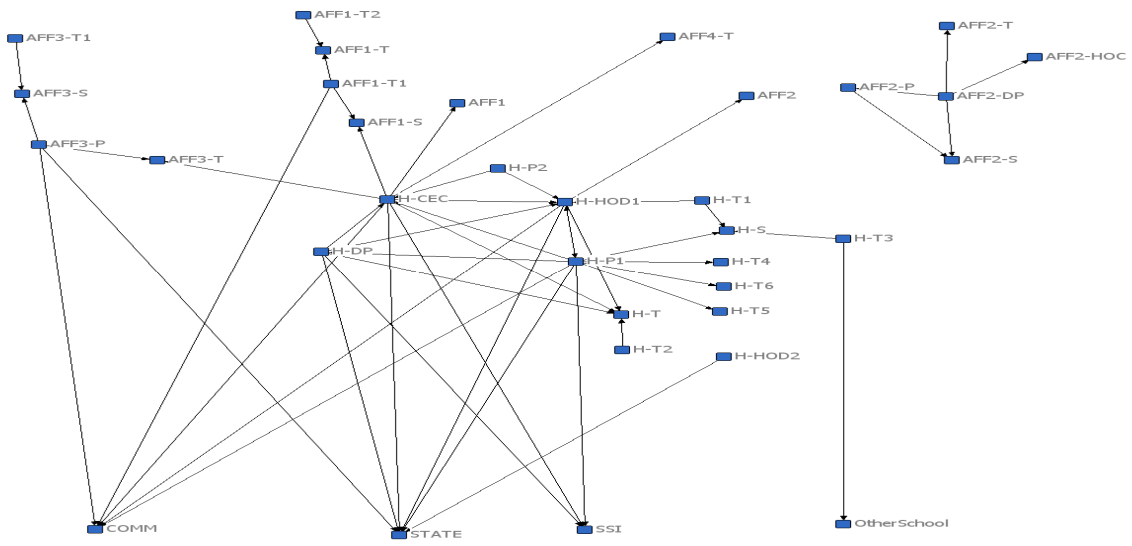


Figure 5 **Hub-C**

In Hub E (refer Figure 4) and Hub C (refer Figure 5), there are isolated Affiliate schools with active subgroup communications around issues related to Indigenous education. Yet, there is no evidence that the Affiliate school is integrated into the larger Hub school network. Notwithstanding, this is also true of older more established Hub clusters as can be seen in Hub A (refer Figure 6). Obviously the Affiliates in Hub A (refer Figure 6) (shown in the right, left and top sections of the diagram) are communicating amount themselves on Indigenous students' educational outcomes. However, several of the Affiliates in this Hub cluster have no reports of communications back to the Hub school. There are 38 observations with a 109 possible ties but only 8% (s.d. .477) overall density in the full matrix, a consequence of the isolation of this subgroups.

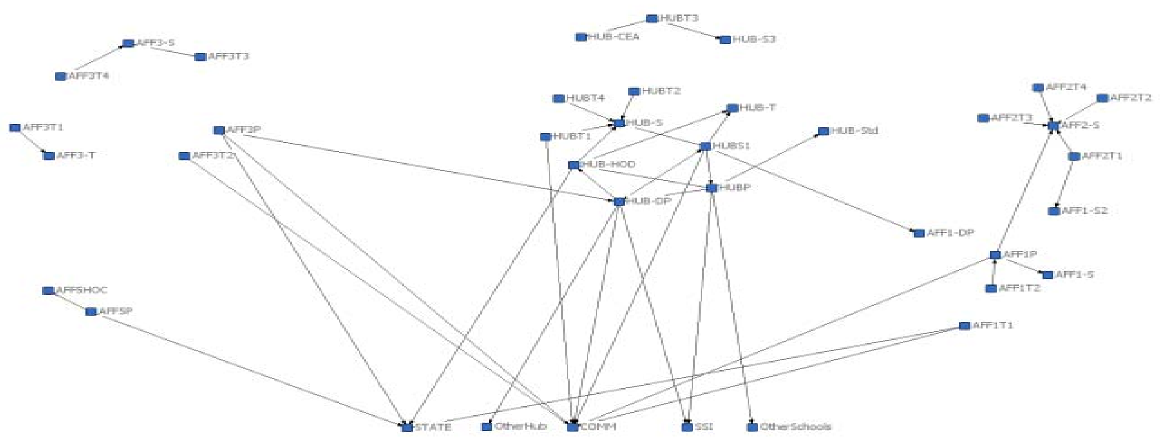


Figure 6 **Hub-A**

AS HUB CLUSTERS BECOME MORE ESTABLISHED, INDIVIDUAL TIES TO EXTERNAL ENTITTIES MAY DIMINSH AS MORE ACTORS COLLABORATE THEIR COMMUNICATION INSIDE THE NETWORK. THIS MAY RESULT IN MORE EFFICIENT FLOWS OF CONTACT TO EXTERNAL TIES AND MORE COORDINATED COMMUNICATION WITH INTERNAL TIES.

The typologies of the newer Hubs show a pattern across the sites being examined. Ties to the outside (state, community, and regional entities) reveal that communication activity is concentrated in this area of the network for newer Hubs and less so for more established Hubs. In newer Hubs, these ties to outside groups are not only more in number, but also are more individualistic than those for more established Hubs. Looking again at Hub-D and Hub-E (refer Figure 7) below, newer members of the SSLC, it is clear that ties to external entities are many and are often made directly from individuals without much coordination or collaboration inside the local school to manage these messages.

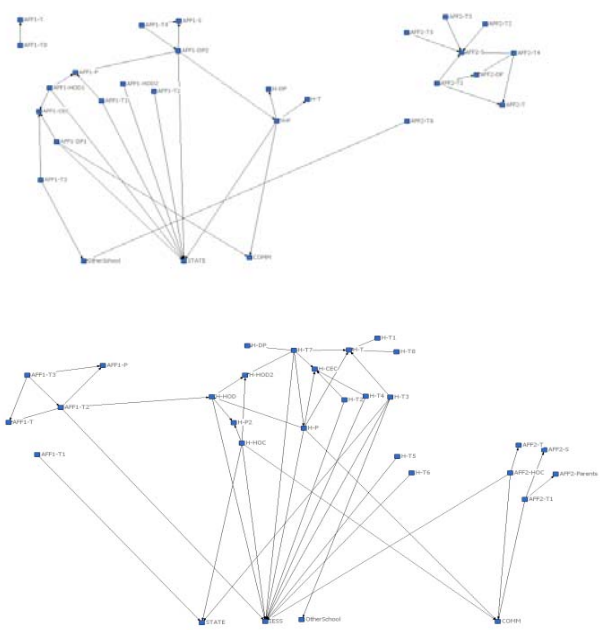
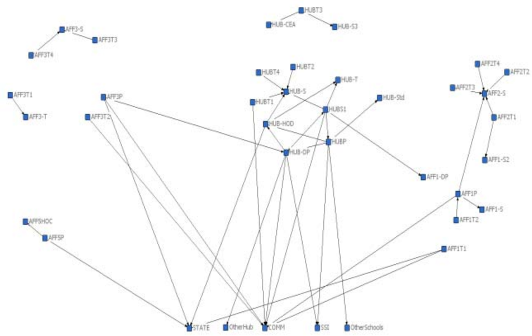


Figure 7 Figure Hub-D + Figure Hub-E

This pattern alters as Hubs become more established, indicted when Hub A and Hub B are compared (refer Figure 8). Ties continue to exist but are mediated through key actors and then dispersed throughout the network to other actors and other schools.



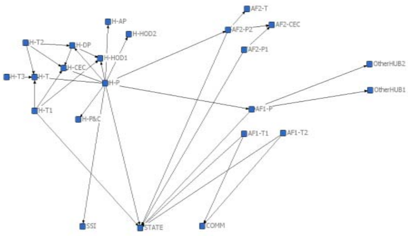


Figure 8 **Hub-A + Hub-B comparison**

Table 3 below shows the pattern of ties as a percentage of the overall ties in the network structure. More established Hubs (A&B) have fewer ties to external entities (12% and 17% versus 23% and 31%). A further pattern also emerges: the longer a school is in the Hub cluster, the more communication they have with Stronger Smarter Institute and with other SSLC Hubs.

Table 3 Information from Hub Clusters to Outside Entities Overtime

	Hub A	Hub B	Hub C	Hub D	Hub E	Hub F
Community, State & Other Schools	12%	17%	14%	23%	31%	8%
SSI & Other HUB Schools	4%	8%	2%	0%	0%	0%

School Teacher Survey

Section 1: Background

(1.1) Date: ___________________________________

(1.2a) Surname:_________________________________ (1.2b) Given Name:

____

(1.3) Current School:

____

(1.4) Current Position: ☐ Teacher ☐ Other (please specify)________________________________

(1.5) Email:____

(1.6) In your current position are you: ☐ Full-time ☐ Part-time

☐ Permanent ☐ Contract

☐ Other (please specify) ____________________________

(1.7) Date of Birth : ____________________________

(1.8) Gender: Female ☐ Male ☐

(1.9) Are you Aboriginal or Torres Strait Islander? Yes ☐ No ☐

(1.10) In what Country were you born? Australia ☐ Other ☐(specify)

____

(1.11) What is the primary language spoken in your home? English ☐ Other ☐

(specify)_____________

Section 2: Education and Work Experience

(2.1) Please provide information on your degrees and credentials. Check the highest degree attained:

- ☐ 3 year Bachelors degree
- ☐ 3 year Bachelors degree + 1 year graduate diploma
- ☐ 3 year Bachelors degree + 2 year graduate diploma or Bachelors Degree
- ☐ Dual Bachelors degree
- ☐ 4 year Bachelors degree
- ☐ Masters degree
- ☐ Doctorate degree
- ☐ Other (please specify)____

Section 2: Education and Work Experience (*continued*)

(2.2) List any specific courses/programs in Indigenous

Education:______________________________________

(2.3) How many years have you worked as a teacher? ____________________(years)

(2.4) How long have you worked at your current school? ___________________(years)

(2.5) What year level(s) do you teach in your current school?

____

(2.4a) If Primary, what is the Class

Name:____

(2.4b) If Secondary, what is the main teaching

area:____

(2.4c) For Secondary, was this subject part of your academic training? Yes ☐ No ☐

(2.6) Have you worked in schools with an Indigenous student population? Yes ☐ No ☐

(2.5a) If yes, how many years have you taught classes with Indigenous students?

________________(years)

(2.7) How many different schools have you worked in since the beginning of 2005? (please check the appropriate number):

1	2	3	4	5	6	7	8	9	10	10+
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Section 3: Pedagogy and Curriculum

We are interested in your perspectives of curriculum **in your school and classroom.**

Please ***Rank*** in order the following from 1-5 by level of importance as goals for curriculum with

(1 = "Most Important" and 5 = "Less Important")

(3.1) Basic skills acquisition	☐
(3.2) Access to the best of traditional content knowledge in the KLA's	☐
(3.3) Building awareness of Australian Indigenous identity, voice, and cultural knowledge	☐
(3.4) Personal growth and development for each individual	☐
(3.5) Critical analysis of society and culture	☐

In your classroom during a typical school week, please estimate what percentage of time you spend on the following,

(3.6) Administrative tasks (e.g., recording attendance, handing out school information/forms)	☐ %
(3.7) Keeping order in the classroom (e.g., keeping students on task)	☐ %
(3.8) Actual teaching and learning activities	☐ %
(3.9) Other (please specify)	☐ %
TOTAL	**100%**

Section 3a: Grouping Practices

Please describe ability grouping practices in your classroom.
(1 = "None of the Time" to 9 = "All of the Time")

3.1a) Is your class streamed by ability levels? Yes ☐ No ☐									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
3.2a) Students in my classroom work in groups organised according to their ability (e.g., reading or math groups)									
3.3a) When marking everyday work from my students with special needs, I modify my expected standards									
3.4a) When marking everyday work from all other students, I modify my expected standards for students with less ability									
3.5a) I simplify my curriculum for low achieving students									
3.6a) I modify the pace of instruction to keep high achievers engaged									
3.7a) If a student is having trouble with an assignment, I adjust it to their level									

Section 4: Classroom Practices Directions:

The next section contains 2 sub-sections.

Please note:

The first section is for ***Primary*** **Teachers**;

The second section is for ***Secondary*** **Teachers**.

Please answer only the section that is applicable to your situation.

The following questions ask that you estimate the time (*in minutes*) you spent on a classroom activity during a typical week in Term 3. The estimates do not need to add up to a total number, but rather are a *best guess* about the amount of time you allot to the various activities. You may want to consult your diary or workplan to help you estimate the time. If you do not engage an activity, please write down “0” minutes.

Section 4: Classroom Practices (For Primary Teachers)

We are interested in your perspectives of classroom practices.

Please estimate the number of minutes spent ***EXPLICITLY FOCUSING ON*** the following activities during a typical one week time period in Term 3. If the item does not apply, please note"0" minutes.

For PRIMARY TEACHERS	Number of Minutes
4.1a) Teacher-directed instruction in basic skills of initial literacy (e.g., alphabet, vocabulary, phonics, writing skills)	*# Minutes*
4.2a) Teacher-directed instruction in the basic skills of numeracy (e.g., number, count, basic functions)	*# Minutes*
4.3a) Lessons where students are completing worksheets with short answers, fill-in-the-blanks, or multiple choice formats	*# Minutes*
4.4a) Preparing students for standardised testing formats and test taking skills	*# Minutes*
4.5a) Teaching a structured, step-by-step curriculum package according to teacher guidebook (e.g., Jolly Phonics, Go-Maths, Multilit, DISTAR)	*# Minutes*
4.6a) Lessons and activities which feature 'hands on' experience and 'learning by doing' (e.g., building and making things, art work, physical activities)	*# Minutes*
4.7a) Play-based activities to generate high levels of student involvement and participation (e.g., developmental drama, group games, creative writing, and acting)	*# Minutes*
4.8a) Administering individual and/or small group developmental diagnostic assessment tasks (e.g., individual language development tasks, individual reading aloud)	*# Minutes*
4.9a) Lessons and activities on local Indigenous content in the curriculum (e.g., local history, cultural practices, Aboriginal and Torres Strait Islander terms and locations)	*# Minutes*
4.10a) Lessons or activities that involve study of local languages, Aboriginal English, and/or Kriol	*# Minutes*
4.11a) Lessons and activities where students work on real world knowledge (e.g., how to deal with institutions, how to access services, using media)	*# Minutes*
4.12a) Individualised instruction following an Individual Educational Program	*# Minutes*
4.13a) Independent small group work on assigned tasks	*# Minutes*
4.14a) Lessons and activities on content that are negotiated with students on the basis of interest	*# Minutes*
4.15a) Lessons that focus on traditional Australian/English literary content (e.g., Mem Fox, Roald Dahl, E.B White)	*# Minutes*
4.16a) Lessons that focus on key facts and concepts for KLA scientific content and knowledge	*# Minutes*
4.17a) Lessons that focus on key facts and concepts of KLA Australian and World history	*# Minutes*
4.18a) Lessons that focus on knowledge of traditional academic value (e.g., essays, laboratory reports, sonnets)	*# Minutes*
4.19a) Lessons and activities that involve the study and use of Indigenous literature (e.g., Sally Morgan, Dianne Lucas, Eva & Pat Pootchemunka)	*# Minutes*
4.20a) Lessons and activities where issues of Indigenous identity are explored and discussed	*# Minutes*
4.21a) Administering tests/quizzes to assess student learning (non-standardised or standardised, e.g., spelling, reading tests)	*# Minutes*
4.22a) Providing written feedback on student work	*# Minutes*

4.23a) Discussing assessment criteria and standards with students on assignments	# *Minutes*
4.24a) Having students evaluate their own or their classmates' work	# *Minutes*
4.25a) Reviewing students' homework they have prepared in class or at home	# *Minutes*
4.26a) Providing summaries of the previous lessons during class	# *Minutes*
4.27a) Time spent explicitly managing classroom behaviour	# *Minutes*
4.28a) Time spent talking about classroom rules	# *Minutes*
4.29a) Time spent on classroom administrative duties related to students (e.g., roll-taking, etc.)	# *Minutes*
4.30a) Meeting with other teachers to compare or moderate individual student progress	# *Minutes*
4.31a) Providing students verbal or written feedback on their progress	# *Minutes*
4.32a) Lessons that focus on the critical analysis of underlying messages in texts	# *Minutes*
4.33a) Lessons that teach students how texts position them as members of society	# *Minutes*
4.34a) Lessons that ask students to consider critical perspectives on an issue	# *Minutes*
4.35a) Lessons that engage students in a critical discussion of television, movies, web pages, music, art, and other means of expression	# *Minutes*

4.36a) As a Primary Teacher, please comment on Classroom Practices in your school and classroom:

4.37a) Please list professional development activities, programs, and events that have had an influence on your classroom practices:

4.38b) What has been the most important influence in shaping your approach to teaching Indigenous students?

Section 4: Classroom Practices (For Secondary Teachers)

We are interested in your perspectives of classroom practices.

Please estimate the number of minutes spent ***EXPLICITLY FOCUSING ON*** the following activities during a typical one week time period in Term 3. If the item does not apply, please note"0" minutes.

For SECONDARY TEACHERS:	Number of Minutes
Please specify your Main Subject and Report for it: *Subject:*____ *Total amount of time you teach this subject per week:*____________________	
4.1b) Teacher-directed instruction in basic literacy skills (e.g., decoding, reading comprehension, genre instruction)	*# Minutes*
4.2b) Teacher-directed instruction in the basic numeracy (e.g., number, count, basic functions)	*# Minutes*
4.3b) Lessons where students are completing worksheets with short answers, fill-in the-blanks, or multiple choice formats	*# Minutes*
4.4b) Preparing students for standardised testing formats and test taking skills	*# Minutes*
4.5b) Teaching a structured, step-by-step curriculum package according to teacher guidebook (e.g., Go-Maths, SRA)	*# Minutes*
4.6b) Lessons and activities which feature 'hands on' experience and 'learning by doing' (e.g., building and making things, art work, physical activities)	*# Minutes*
4.7b) Project-based activities to generate high levels of student involvement and participation	*# Minutes*
4.8b) Administering individual and/or small group developmental diagnostic assessment tasks (e.g., individual development tasks, individual reading, assisted writing)	*# Minutes*
4.9b) Lessons and activities on local Indigenous content in the curriculum (e.g., local history, cultural practices, Aboriginal and Torres Islander Strait terms and locations)	*# Minutes*
4.10b) Lessons or activities that involve study of local languages, Aboriginal English, and/or Kriol	*# Minutes*
4.11b) Lessons and activities where students work on real world knowledge (how to deal with institutions, how to access services, using media)	*# Minutes*
4.12b) Individualised instruction following an Individual Educational Program	*# Minutes*
4.13b) Independent small group work on assigned tasks	*# Minutes*
4.14b) Lessons and activities on content that are negotiated with students on the basis of interest	*# Minutes*
4.15b) Lessons that focus on traditional Australian/English literary content (e.g., Marsden, Shakespeare, Orwell)	*# Minutes*
4.16b) Lessons that focus on key facts and concepts for KLA scientific content and knowledge	*# Minutes*
4.17b) Lessons that focus on key facts and concepts of KLA Australian and World History	*# Minutes*
4.18b) Lessons that focus on knowledge of traditional academic value (e.g., essays, laboratory reports, sonnets)	*# Minutes*
4.19b) Lessons and activities that involve the study and use of Indigenous literature (e.g., Morgan, Ward, Davis, Mudrooroo)	*# Minutes*
4.20b) Lessons and activities where issues of Indigenous identity are explored and discussed	*# Minutes*

4.21b) Administering tests/quizzes to assess student learning (non-standardised or standardised, e.g., spelling, reading tests)	*# Minutes*
4.22b) Providing written feedback on student work	*# Minutes*
4.23b) Discussing assessment criteria and standards with students on assignments	*# Minutes*
4.24b) Having students evaluate their own or their classmates' work	*# Minutes*
4.25b) Reviewing students' homework they have prepared in class or at home	*# Minutes*
4.26b) Providing summaries of the previous lessons during class	*# Minutes*
4.27b) Time spent explicitly managing classroom behaviour	*# Minutes*
4.28b) Time spent talking about classroom rules	*# Minutes*
4.29b) Time spent on classroom administrative duties related to students (e.g., roll-taking, etc.)	*# Minutes*
4.30b) Meeting with other teachers to compare or moderate individual student progress	*# Minutes*
4.31b) Providing students verbal or written feedback on their progress	*# Minutes*
4.32b) Lessons that focus on the critical analysis of underlying messages in texts	*# Minutes*
4.33b) Lessons that teach students how texts position them as members of society	*# Minutes*
4.34b) Lessons that ask students to consider critical perspectives on an issue	*# Minutes*
4.35b) Lessons that engage students in a critical discussion of television, movies, web pages, music, art, and other means of expression	*# Minutes*
4.36b) Lessons and activities that are part of vocational education training modules	*# Minutes*
4.37b) Preparing students for work-based or on-site job activities	*# Minutes*
4.38b) Preparing students for community-based service or volunteer activities	*# Minutes*

4.39b) As a Secondary Teacher, please comment on Classroom Practices in your school and classroom:

____

____

____

4.44.40b) Please list professional development activities, programs, and events that have had an influence on your classroom practices:

____

____

4.41b) What has been the most important influence in shaping your approach to teaching Indigenous students?

____

Section 5: Cultural Knowledge and Engagement

We are interested in your experiences related to Indigenous Cultural Knowledge and Engagement
Please indicate the frequency with which you have participated in the following activities in the last 6 months.

	# of Times in the Last 6 Months
5.1) I have had a conversation with Indigenous community members outside of school in the community where I teach.	#
5.2) I have been invited to Indigenous family or Indigenous community gatherings in the community where I teach.	#
5.3) I have participated in Indigenous community events in the community where I teach (e.g., festivals, celebrations, gatherings).	#
5.4) I have met with the parent or caregiver of an Indigenous student I teach.	#
5.5) I have visited the home of an Indigenous student I teach.	#
5.6) I have had a conversation with the parent or caregiver of an Indigenous student I teach about something other than student achievement or behaviour.	#
5.7) I have visited an Indigenous organisation in the community where I teach (e.g., youth organisation, health or housing organisation, political organisation, community centre).	#
5.8) I have shared a meal or refreshments with Indigenous people in a social environment.	#

Please indicate on the scale below to what degree the statements reflect your participation in or knowledge of the following activities (***1 = "not much" to 9 = "a lot"***)

	Your Current Situation								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
5.9) I have read, watched, or listened to local or national Indigenous media (e.g., radio, television, newspapers, magazines, websites).									
5.10) I have read research on supporting Indigenous student learning (e.g., journal articles, conference papers, policy reports).									
5.11) I have participated in professional development activities focused on supporting Indigenous student learning.									
5.12) I am familiar with the Indigenous histories of the community where I teach.									
5.13) I am familiar with the Indigenous geographies and place names of the community where I teach.									
5.14) My pre-service teacher education program prepared me to support Indigenous student learning.									

5.15) Please name the Indigenous custodians of the land in the community where you teach.

____

5.16) Please name the language(s) spoken by Indigenous peoples in the community where you teach.

____

5.17) Please comment on what you think a new teacher in this school needs to know in order to teach Indigenous students?

Section 6: Networks

In response to the question below please write the role of the person(s) (e.g., classroom teacher, local community member, principal, deputy principal, school staff member, health care worker, Indigenous education advisor etc.) and where that person is located (e.g., Clearwater SHS, Saratoga Primary School, Wilbraham Regional Office, Summerville Local Community, Regional Partner Research Team).

6.1) Who do you ***talk to or consult with,*** *in relation to improving Indigenous student educational outcomes?*
If you do not communicate with others on this topic then leave blank.

Person number	**Role of this person**	**Name of organisation**	**What do you talk about?**	**In the last month, how often have you talked to this person?**	**In the last 3 months, how often have you talked to this person?**
1	e.g., Classroom Teacher	e.g., Clearwater SHS	e.g., Standards, Community Relations, etc)	3	5
2					
3					
4					
5					
6					
7					

6.2) Please comment on any other important relationships you have related to improving Indigenous student educational outcomes:

Section 7a: Indigenous Student Learning

Please provide further comments on the following:

7.1a) In your experience, what are the most important influences on Indigenous student learning?

7.2a) In your experience, what are the problems that Indigenous students face at your school?

7.3a) In your experience, what are the most effective solutions to the problems Indigenous students face at your school?

7.4a) In your experience, what is Indigenous student "success?"

7.5a) In your opinion, what are the goals in the schooling of Indigenous students?

Section 7b: Expectations for Student Outcomes

We are interested in your expectations for Indigenous student **in your school and classroom.**

Given the constraints and resources in your school and classroom, please ***Rank*** in order the following from 1 to 4 by level of priority with

(1 = "Top Priority" and 4 = "Lowest Priority")

(7.1b) Attendance	☐
(7.2b) NAPLAN Achievement Scores	☐
(7.3b) Behaviour	☐
(7.4b) Continuing Education	☐

7.5b) Please comment about expectations for student in your school and classroom:

____

____

Section 8: High Expectations

We are interested in your views of high expectations in your school and classroom.

High Expectations is the capacity of Indigenous students to perform at the same or better level than their peers.

Please indicate on the scale below to what degree the statements reflect the situation in your school or classroom.

(***1 = "not much" to 9 = "a lot"***) If the item doesn't apply, please leave blank.

	Your Current Situation								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
8.1) Indigenous students are challenged to achieve their potential.									
8.2) High expectations for Indigenous student achievement are promoted in school policies.									
8.3) High expectations for Indigenous student learning are promoted in staff meetings.									
8.4) Staff are mentored in the importance of setting high expectations for Indigenous students.									
8.5) The school staff takes **collective** responsibility for unlocking potential in Indigenous students.									
8.6) High expectations for Indigenous student learning are embedded in my classroom context.									
8.7) Parents of Indigenous students are consulted about high expectations for their children.									
8.8) I contact parents/caregivers when students do not reach expected outcomes.									

8.9) Please comment on High Expectations in your school and classroom:

____

____

____

Section 9. Indigenous Identity

We are interested in your views on engagement with Indigenous identity in your school.

Please indicate on the scale below to what degree the statements reflect the situation in your school.

(***1 = "not much" to 9 = "a lot"***) If you do not know, please mark that column.

	I Don't Know	Your Current Situation								
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
9.1) Our curriculum is modified to embed Indigenous knowledges and ways of knowing.										
9.2) Our schools adopts pedagogies that are sensitive to Indigenous students' ways of knowing.										
9.3) Our school promotes communication between Indigenous and non-Indigenous students.										
9.4) Indigenous signs and symbols (e.g., art work, student murals) are displayed in our classrooms.										
9.5) Our classes actively participate in Indigenous events.										
9.6) Indigenous people participate in and/or advise on class events.										
9.7) Indigenous students feel as though they belong in our classes.										

9.8) The use of Indigenous languages is encouraged in our classrooms.										

9.9) Please comment on Indigenous identity in your school:

____

____

____

Section 10. Indigenous Leadership

We are interested in your views of Indigenous leadership at your school.

Please indicate on the scale below to what degree the statements reflect the situation in your school.

(***1 = "not much" to 9 = "a lot"***) If you do not know, please mark that column.

	I Don't Know	**Your Current Situation**								
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
10.1) Indigenous and non-Indigenous staff plan curriculum together.										
10.2) Indigenous community members are involved in curriculum planning.										
10.3) Indigenous community members are professional development leaders for school staff.										
10.4) Indigenous staff hold formally recognised leadership positions in the school (e.g., deputy principal, head of department, head of curriculum, etc.).										
10.5) Indigenous staff hold informal leadership positions in the school (e.g., sports coordinator, before/after school coordinator responsible for Indigenous student initiatives, etc.).										
10.6) Indigenous staff hold committee positions in the school.										
10.7) Indigenous community members hold committee positions on governance boards (e.g., councils and leadership groups).										
10.8) Indigenous community members involved with the school mentor staff.										
10.9) Indigenous students hold formally recognised leadership positions in the school (e.g., class captain, house captain, or prefect).										

10.10) Please comment on Indigenous leadership at your

school:____

____

____

Section 11: Community Engagement

We are interested in your views of community engagement at your school and in your classroom.
Please indicate on the scale below to what degree the statements reflect the situation in your school or classroom.

(***1 = "not much" to 9 = "a lot"***) If you do not know, please mark that column.

	I Don't Know	**Your Current Situation**								
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
11.1) Indigenous community members participate in classroom teaching or student learning.										
11.2) There is a program to encourage Indigenous community members to become actively involved in the school.										
11.3) I involve Indigenous community members in my classroom.										
11.4) An outreach program is maintained to reach out to Indigenous parents/caregivers who do not visit the school.										
11.5) Indigenous community members meet regularly with school governance boards (e.g., councils and leadership groups, P&C/P&F committees).										
11.6) Indigenous community members are consulted on major decisions about the direction of the school.										
11.7) Indigenous community priorities are taken into account as part of the school planning process.										
11.8) Indigenous community members have a voice in the everyday running of the school.										
11.9) School staff have significant roles in meetings and events that involve the Indigenous community.										

11.10) Does the school have a formal partnership agreement with the local Indigenous community it serves?
Yes ☐ No ☐ Don't Know ☐

11.11) Does the school have a specific staff member in charge of Indigenous education?
Yes ☐ No ☐ Don't Know ☐

11.12) If so, how was this person chosen?

____

____

11.13) Please comment on how your school promotes Indigenous community engagement:

____

____

Section 12: SSLC Hub & Affiliate School Links

Please comment on your school's relationships with other Stronger Smarter Learning Communities Schools:
Please indicate on the scale below to what degree the statements reflect the situation in your school.

(1 = "not much" to 9 = "a lot")

12.1) Is your school: A Stronger Smarter Learning Communities *Hub* School? **Yes** ☐ **No** ☐ **Don't Know** ☐ A Stronger Smarter Learning Communities *Affiliate* School? **Yes** ☐ **No** ☐ **Don't Know** ☐ Involved in Stronger Smarter Learning Communities? **Yes** ☐ **No** ☐ **Don't Know** ☐	**Your Current Situation**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
12.2) The Stronger Smarter Learning Communities schools in our network share professional development activities.									
12.3) The Stronger Smarter Learning Communities relationship leads to staff communicating regularly.									
12.4) The Stronger Smarter Learning Communities relationship leads to staff exchanges taking place to share practices.									
12.5) The Stronger Smarter Learning Communities relationship leads to different approaches to staffing and school organisation.									
12.6) The Stronger Smarter Learning Communities relationship leads to improved student outcomes in my school.									
12.7) The Stronger Smarter Learning Communities relationship leads to enhanced curriculum in my school.									
12.8) The Stronger Smarter Learning Communities relationship leads to improved pedagogy in my school.									
12.9) The Stronger Smarter Learning Communities relationship leads to more effective leadership.									
12.10) The Stronger Smarter Learning Communities relationship leads to a more positive approach to Indigenous identity.									
12.11) The Stronger Smarter Learning Communities relationship leads to greater capacity to promote Indigenous students' learning.									

12.12) Please comment on any other effects or influences from these Affiliate and/ or Hub school relationships:

____

____

Appendix 3.1.1 Indigenous School Ethos Measurement Model

Table 4 Indigenous School Ethos Measurement Model

The Items

Item name	Description
TSII1	Our curriculum is modified to embed Indigenous knowledges and ways of knowing.
TSII2	Our schools adopts pedagogies that are sensitive to Indigenous students' ways of knowing.
TSII3	Our school promotes communication between Indigenous and non-Indigenous students.
TSII4	Indigenous signs and symbols (e.g., art work, student murals) are displayed in our classrooms.
TSII5	Our classes actively participate in Indigenous events.
TSII6	Indigenous people participate in and/or advise on class events.
TSII7	Indigenous students feel as though they belong in our classes.
TSII8	The use of Indigenous languages is encouraged in our classrooms.

Descriptives:

Table 5 Statistics

Statistics

	TS111	TS112	TS113	TS114	TS115	TS116	TS117	TS118
N Valid	239	241	238	248	244	239	222	239
Missing	173	171	174	164	168	173	190	173
Mean	5.3640	5.6390	7.2731	5.6855	6.1311	5.6402	7.4099	2.6778
Std. Error	.15527	.15544	.13781	.17544	.16010	.16861	.14317	.15084
sd	2.40039	2.41315	2.12604	2.7628	2.50087	2.60660	2.13323	2.33191
Skewness	-.353	-.345	-1.356	-.440	-.639	-.419	-1.486	1.373
Std. Error	.157	.157	.158	.155	.156	.157	.163	.157
Kurtosis	-.913	-.842	1.119	-1.150	-.638	-1.033	1.400	.819
Std. Error	.314	.312	.314	.308	.310	.314	.325	.314
Minimum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maximum	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00

The minimum and maximum values for each variable lie in the scale range of 1-9 respectively indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 2.68 to 7.41 on a 9 point scale with standard deviations around >2 suggesting range of response is adequate.

Both exploratory and confirmatory factor analysis (refer Tables above) are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms (refer Figures below) would indicate important departures from normality with some variables. To this end only TS111, TS112, TS114, TS115 and TS116 were retained in the initial analysis.

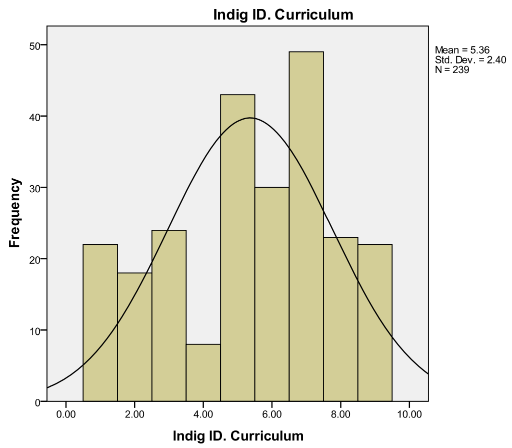


Figure 9 **Histogram - Indigenous ID Curriculum**

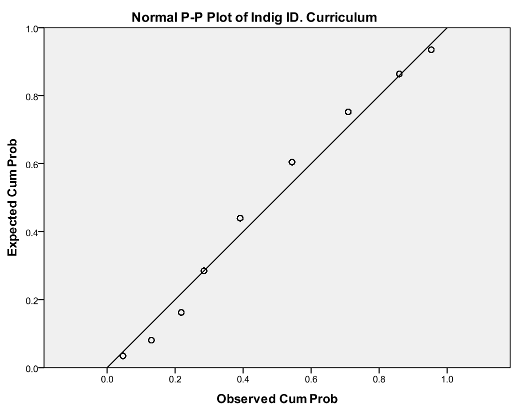


Figure 10 **P-P Plot - Indigenous ID Curriculum**

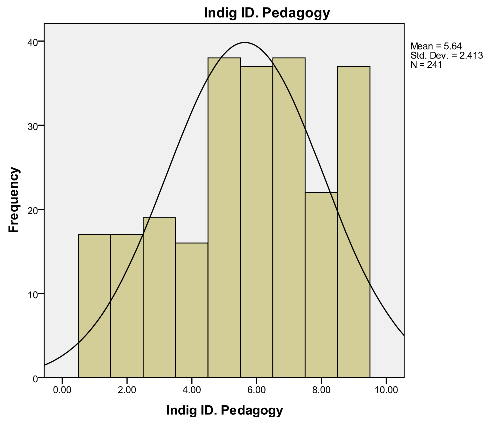


Figure 11 **Histogram - Indigenous ID Pedagogy**

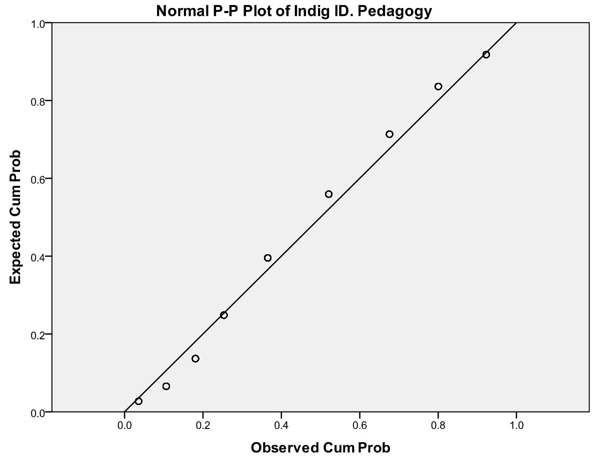


Figure 12 **P-P Plot - Indigenous ID - Pedagogy**

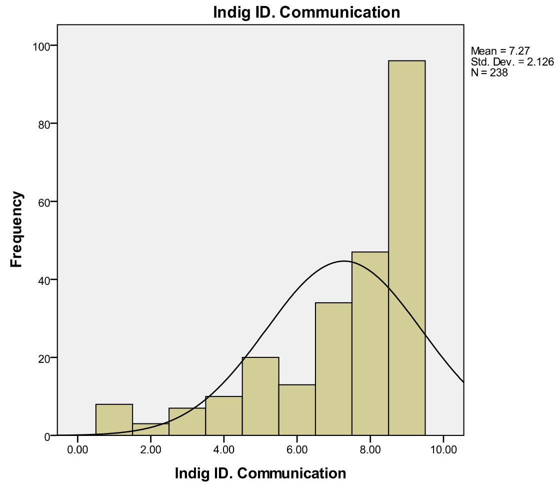


Figure 13 **Histogram - Indigenous ID Communication**

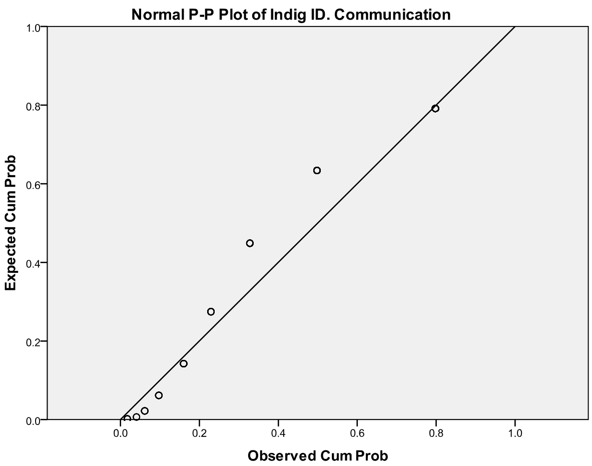


Figure 14 P-P Plot - Indigenous ID Communication

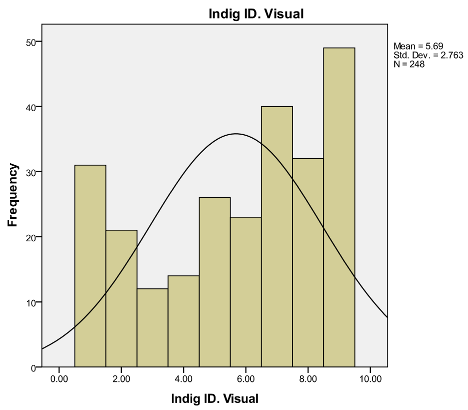


Figure 15 Histogram - Indigenous ID Visual

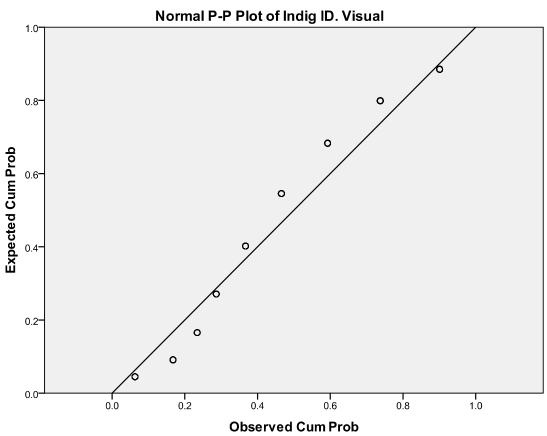


Figure 16 P-P Plot - Indigenous ID Visual

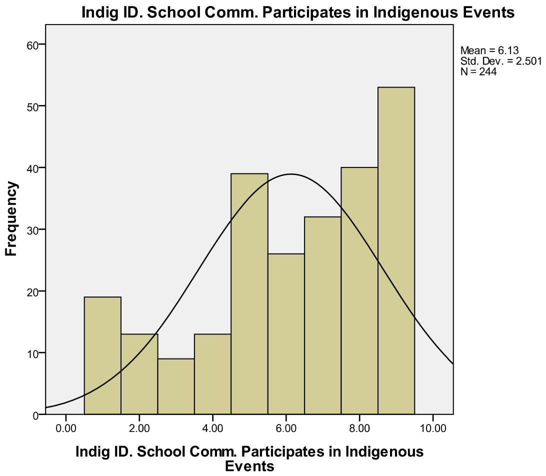


Figure 17 Histogram - Indigenous School Communities Participates in Indigenous Events

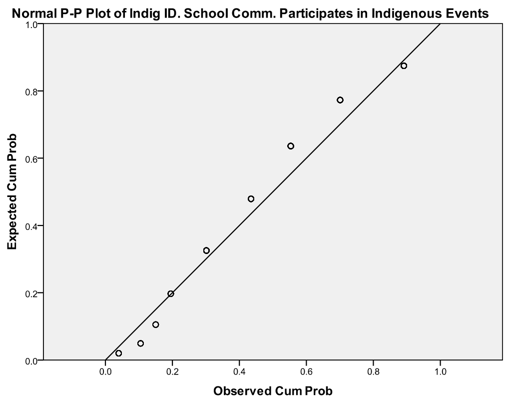


Figure 18 P-P Plot - Indigenous School Communities Participates in Indigenous Events

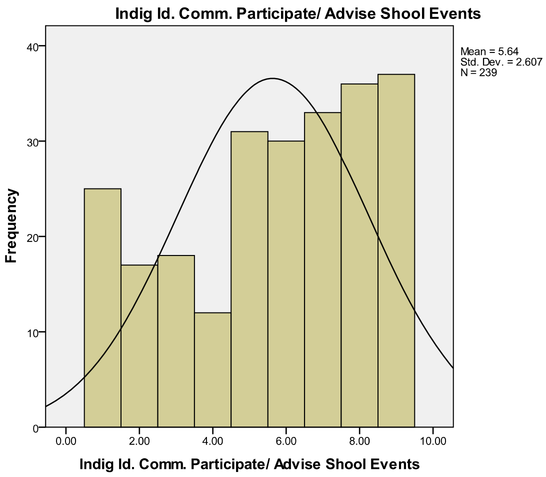


Figure 19 Histogram - Indigenous Communities Participate/Advise School Events

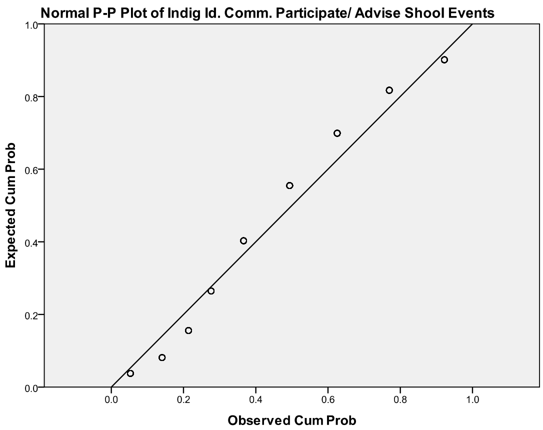


Figure 20 P-P Plot - Indigenous Communities Participate/Advise School Events

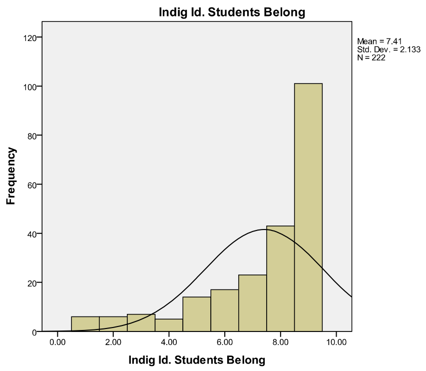


Figure 21 Histogram - Indigenous Students Belong

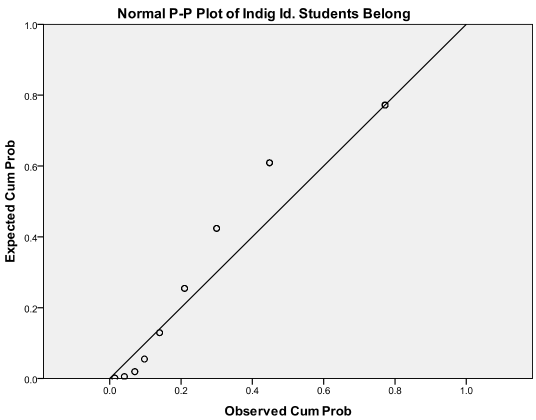


Figure 22 P-P Plot - Indigenous Students Belong

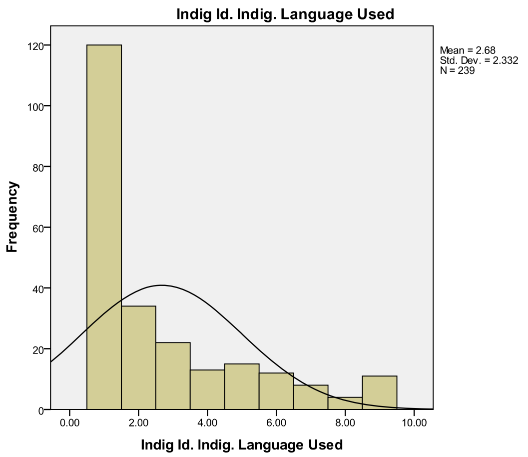


Figure 23 **Histogram - Indigenous Language Used**

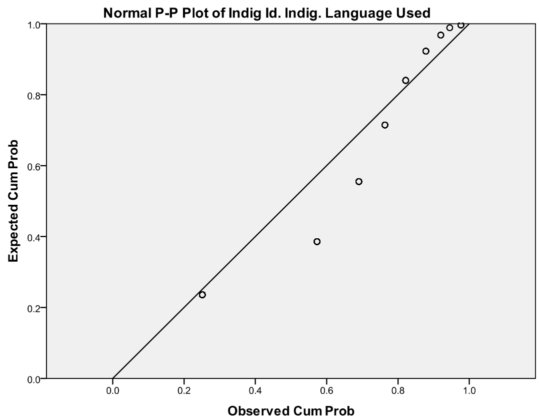


Figure 24 **P-P Plot - Indigenous Language Used**

The measurement model

Given the sample used in this analysis is drawn from a constrained population (teachers) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 6).

Table 6 Correlation Matrix

Correlation Matrix

		TS111	TS112	TS114	TS115	TS116
Correlation	TS111	1.000				
	TS112	.710	1.000			
	TS114	.393	.425	1.000		
	TS115	.449	.543	.450	1.000	
	TS116	.439	.498	.423	.683	1.000
Sig. (1-tailed)	TS111		.			
	TS112	.000				
	TS114	.000	.000			
	TS115	.000	.000	.000		
	TS116	.000	.000	.000	.000	

The correlation matrix (refer Table 6) shows the majority of the correlations are greater than 0.4 and most variables have a medium to large correlation with at least 2 or 3 other variables and all are significant (though this is not surprising given the large sample size). This would suggest there may be some basis for applying an EFA.

Table 7 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.778
Bartlett's Test of Sphericity	Approx. Chi-Square	431.636
	df	10
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 431.636 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.778 would suggest there is probably a factor structure underlying the variables(refer Table 7).

Table 8 Communalities

Communalities

	Initial	Extraction
TS111	.520	.533
TS112	.578	.638
TS114	.270	.318
TS115	.535	.549
TS116	.502	.504

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 8) would indicate a reasonable level of variation (small < 0.3) in the items is being explained by all the latent factors. Specifically between 32% and 64% of the variance in items is being explained by the underlying factor structure.

Table 9 Total Variance Explained

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.017	60.344	60.344	2.542	50.837	50.837
2	.748	14.961	75.304			
3	.637	12.745	88.050			
4	.325	6.493	94.542			
5	.273	5.458	100.000			

The above table (refer Table 9) shows that only one of the eigenvalues exceeds one – as a result 1 factor will be extracted. Factor 1 is accounting for ~ 60% of the total variance of 5 (5 because we have 5 variables and the variance for each variable has been standardised to 1).

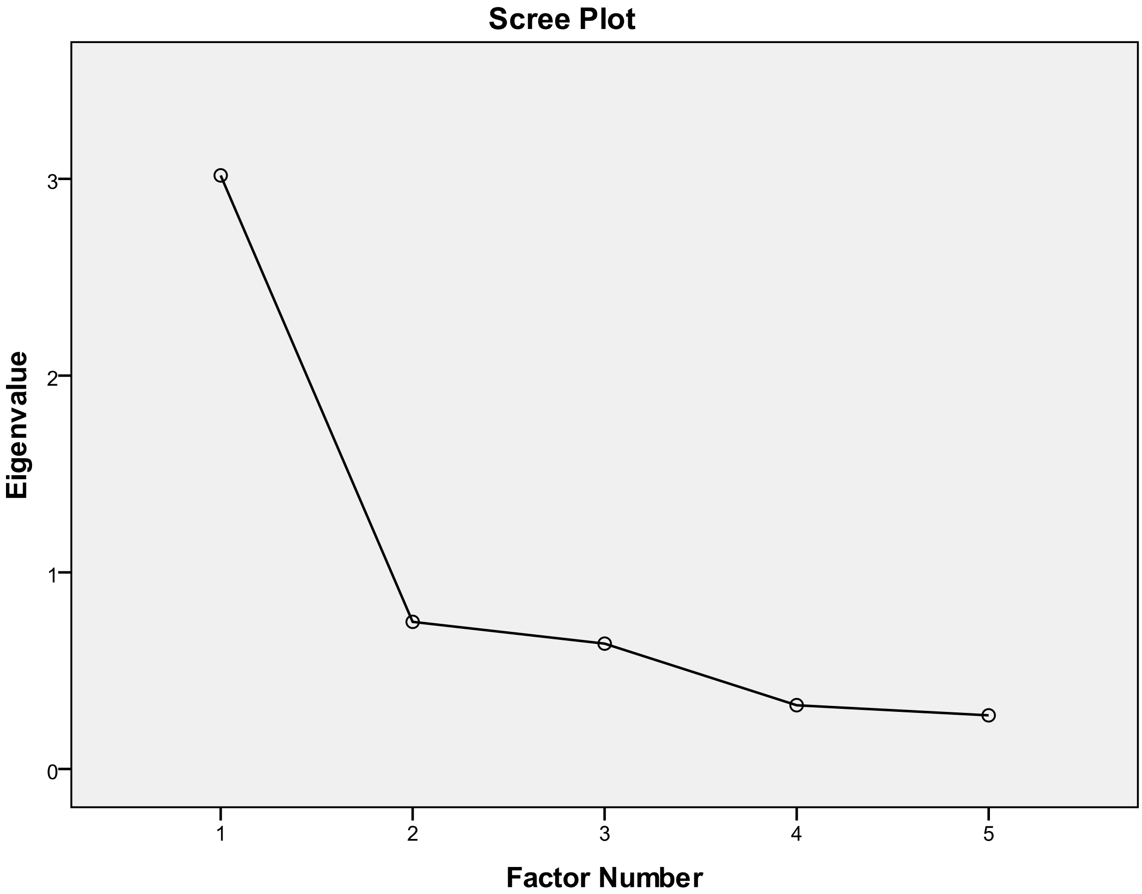


Figure 25 **Scree Plot**

Examination of the scree plot (refer Figure 25) would indicate a one factor solution is appropriate and parsimonious.

Table 10 Factor Matrix

Factor Matrix

	Factor 1
TS112	.799
TS115	.741
TS111	.730
Ts116	.710
TS114	.564

The factor matrix (refer Table 10) gives the factor loadings for each item on the underlying construct. It is clear all items load well on the single factor.

Confirmatory factor analysis

Single factor congeneric measurement models was separately constructed and tested for fit. A single factor congeneric model of Indigenous School Ethos (refer Figure 26) was specified as a latent variable with 5 reflective indicators. To set the scale of the latent variable the variance of the Indigenous School Ethos construct was set to one rather than the usual practice of setting a factor loading to 1. This was done to allow a significance level to be generated for every factor loading. If a factor loading is set to one a significance level is not generated for that factor. The model with standardised parameters is illustrated.

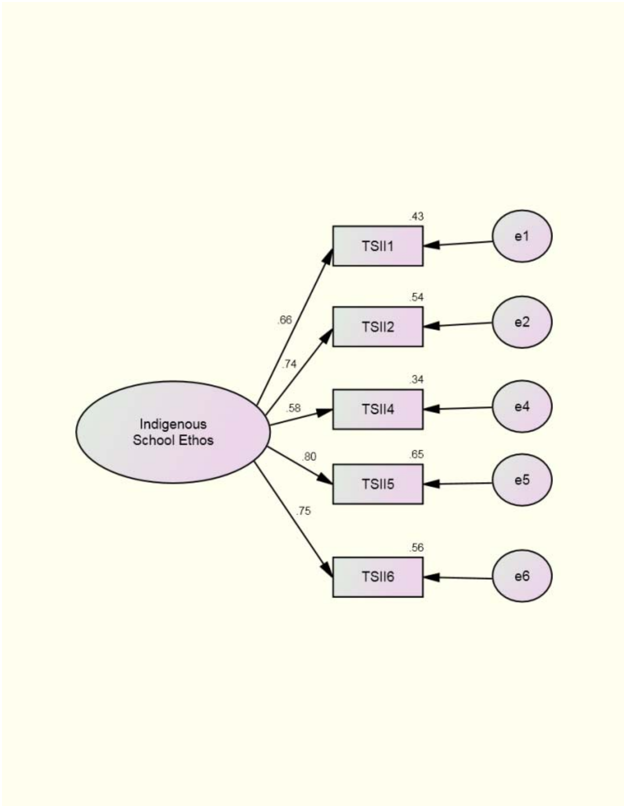


Figure 26 **Measurement Model – Indigenous School Ethos**

The model (refer Figure 26) converged but did not fit the data well χ^2 (5)= 55.047, p= .000. The factor coefficients ranged from a low of 0.58 to a high of 0.80. All coefficients exceed 0.4 so on this basis all items would be retained if the model was a good fit.

An examination of the modification index (MI) indicated the chi square value would decrease by at least 38 units if the covariance of the error terms associated with the indicators TS111 and TS112 was freely estimated. An examination of the standardised residual covariance matrix indicated TS111 was not a good fit (some standardised residuals > 2) so as a preliminary measure TS111 was dropped from the model. This was substantively justified on the grounds respondents were possibly conflating TS111 and TS112 caused by confusion over the definition and scope of terms "pedagogy" and "curriculum".

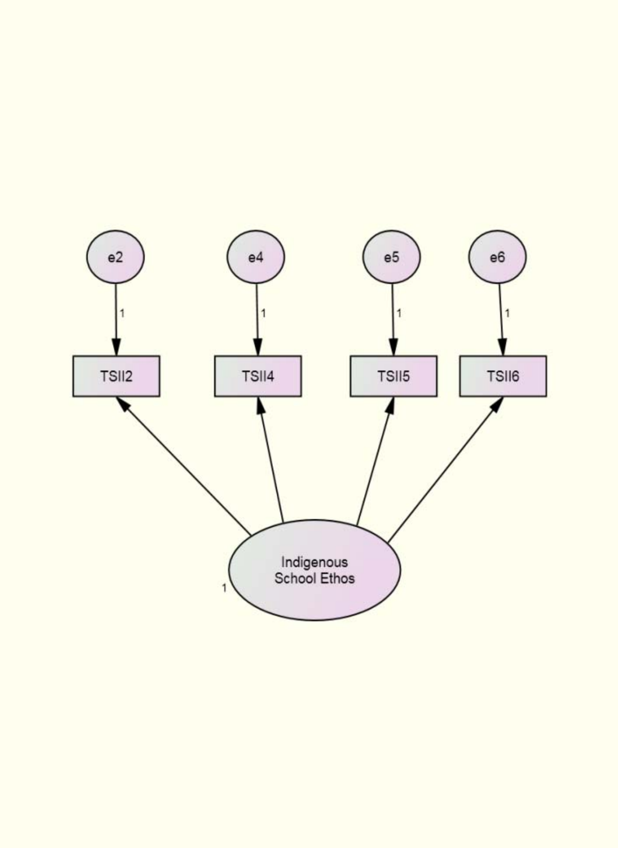


Figure 27 **Measurement Model Indigenous School Ethos**

The model (refer Figure 27) converged and was a good fit. The factor coefficients ranged from a low of .56 to a high of .87 – which is a good result.

In summary - a one factor congeneric model of the latent construct Indigenous School Ethos (refer Figure 27) was respecified as a latent variable with 4 reflective indicators. The data fit the model well χ^2 (2)= 3.294, p= .193, RMSEA = .059 (.000, .170), GFI = .911, TLI = .984 and CFI = .995.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case neither the tau model (χ^2 (5) = 20.036, p = .001) nor the parallel model (χ^2 (8) = 39.428, p = .000) fitted the data well so the congeneric model is retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation (ρίξ) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while ρίξ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). The SMCs for the indicator variables mapped by the Indigenous School Ethos factor were TS112 (.398), TS114 (.310), TS115 (.765) and TS116 (.621). Ts115 and TS116 are above the "good" cut-off while TS112 and TS114 are above the acceptable cut off. In summary the Indigenous School Ethos factor is explaining between 31% and 77% of the variance across the individual indicator variables.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for Indigenous School Ethos factor is .81; well above the recommended cut off.

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the factor Indigenous School Ethos was.52. In other words the factor Indigenous School Ethos is accounting in total for 52% of the variation in the indicator variables which is just above the recommended cut off of 50%.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Indigenous School Ethos factor model was .855 which represents a high reliability (Hancock & Mueller) and is in line with previous measures calculated.

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The Indigenous School Ethos factor model fitted well as confirmed by the non significant $\chi 2$ supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were TS112 (8.835), TS114 (7.595), TS115 (13.212) and Ts116 (11.590) all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommended that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for all items were .63, .56, .87 and .79. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

Index score

A scale score for the Indigenous School Ethos construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression (refer Table 11) coefficient of each indicator and summing.

Table 11 - Regression Weights

	TS112	TS114	TS115	TS116
Raw regression weights Indigenous School Ethos	.063	.041	.209	.112
Proportional regression weights Indigenous School Ethos	.148	.096	.492	.264

The scale score then becomes:

Indigenous School Ethos score = (*TS112*.148)* + *(*TS114*.096*)* + *(*TS115*.492*)* + *(*TS116*.264*)*

This approach ensures the estimates of the scale score adjusted for measurement error is proportionally weighted by the actual contribution made by each indicator. The proportional regression weight (refer Table 11) scores sum to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same 'metric' as that of indicators for the construct.

Appendix 3.1.2 Community Engagement

Table 12 Teachers Survey Description

The Items

Item name	Description
TSCE1	Indigenous community members participate in classroom teaching or student learning.
TSCE2	There is a program to encourage Indigenous community members to become actively involved in the school.
TSCE3	I involve Indigenous community members in my classroom.
TSCE4	An outreach program is maintained to reach out to Indigenous parents/caregivers who do not visit the school.
TSCE5	Indigenous community members meet regularly with school governance boards (e.g., councils and leadership groups, P&C/P&F committees).
TSCE6	Indigenous community members are consulted on major decisions about the direction of the school.
TSCE7	Indigenous community priorities are taken into account as part of the school planning process.
TSCE8	Indigenous community members have a voice in the everyday running of the school.
TSCE9	School staff have significant roles in meetings and events that involve the Indigenous community.

Descriptives:

Table 13 Statistics

Statistics

		TSCE1	TSCE2	TSCE3	TSCE4	TSCE5	TSCE6	TSCE7	TSCE8	TSCE9
N	Valid	221	206	237	173	163	166	186	179	198
	Missing	28	43	12	76	86	83	63	70	51
Mean		3.5475	4.4029	3.1266	3.8728	3.9755	4.2651	4.6344	3.8101	4.3939
Std. Error		.16457	.19019	.16147	.20734	.20977	.21553	.19565	.20366	.20274
Std. Deviation		2.44647	2.72974	2.48572	2.72713	2.67810	2.77689	2.66827	2.72477	2.85280
Skewness		.569	.174	.872	.513	.477	.311	.126	.661	.337
Std. Error		.164	.169	.158	.185	.190	.188	.178	.182	.173
Kurtosis		-.882	-1.287	-.495	-1.080	-1.031	-1.255	-1.211	-.891	-1.290
Std. Error		.326	.337	.315	.367	.378	.375	.355	.361	.344
Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maximum		9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00

The minimum and maximum values for each variable lie in the scale range of 1-9 (refer Table 13) respectively indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 3.13 to 4.63 on a 9 point scale. The mean is skewed towards the low end of the scale as the mode on all items was a response of “1 – not much”. This has implications for conducting statistical analysis (refer Table 13) that rely on normal distributions of responses. However standard deviations are around 2.5 suggesting range of response is adequate.

Missing value analysis indicated that 249 out of a total of 412 cases were complete with respect to the item list – this includes “don’t know” responses. The remaining 163 cases are not missing at random. It would appear that these cases did not complete any items in the item list – perhaps due to response fatigue.

Table 14 Univariate Statistics

Univariate Statistics

	N	Mean	Std. Deviation	Missing		No. of Extremes[a]	
				Count	Percent	Low	High
TSCE1	249	4.2731	3.07922	163	39.6	0	0
TSCE2	249	5.3695	3.26393	163	39.6	0	0
TSCE3	249	3.4578	2.83825	163	39.6	0	0
TSCE4	249	5.7430	3.62649	163	39.6	0	0
TSCE5	249	6.0562	3.59503	163	39.6	0	0
TSCE6	249	6.1767	3.53110	163	39.6	0	0
TSCE7	249	5.9920	3.28240	163	39.6	0	0
TSCE8	249	5.5502	3.61985	163	39.6	0	0
TSCE9	249	5.5422	3.40647	163	39.6	0	0

Table 15 Tabulated Patterns

Tabulated Patterns

Number of Cases		Missing Patterns									Complete if ...[b]
		TSCE1	TSCE2	TSCE3	TSCE4	TSCE5	TSCE6	TSCE7	TSCE8	TSCE9	
dimension0	249										249
	163	X	X	X	X	X	X	X	X	X	412

The 163 cases were deleted from the response set. The ‘don’t know” response was then recoded as system missing. A new variable “totmiss” (refer Table 15) was calculated that contained a count of the number of missing response (missing plus “don’t know”) per case across the response set. Those cases that had a missing count of 4 or more (out of 9) were deleted. This left 178 cases of the original 249 (those that gave some response)

Table 16 **Univeriate Statistics**

Univariate Statistics

	N	Mean	Std. Deviation	Missing Count	Missing Percent	No. of Extremes[a] Low	No. of Extremes[a] High
TSCE1	178	3.5843	2.49206	0	.0	0	0
TSCE2	174	4.3621	2.72665	4	2.2	0	0
TSCE3	176	3.4148	2.53289	2	1.1	0	0
TSCE4	158	3.7532	2.68681	20	11.2	0	0
TSCE5	158	4.0063	2.66015	20	11.2	0	0
TSCE6	162	4.2654	2.77700	16	9.0	0	0
TSCE7	172	4.6105	2.67859	6	3.4	0	0
TSCE8	170	3.8412	2.73992	8	4.5	0	0
TSCE9	171	4.3626	2.85278	7	3.9	0	0

The resultant percent missing for most variables is small with TSCE4, TSCE5 and TSCE6 (refer Table 16) having the greatest percent missing around 10%. While Cohen and Cohen (1983) suggest that missing data up to 10% is not problematic as the majority of missing values represent the 'don't know' response a decision was made to use maximum likelihood estimation (expectation-maximization EM) to impute likely values for those missing. An analysis of the table of estimated means and standard deviations (refer Tables below) against those computed using complete response lists indicated no large deviations as a result of the imputation process.

Table 17 Summary of Estimated Means

Summary of Estimated Means

	TSCE1	TSCE2	TSCE3	TSCE4	TSCE5	TSCE6	TSCE7	TSCE8	TSCE9
All Values	3.5843	4.3621	3.4148	3.7532	4.0063	4.2654	4.6105	3.8412	4.3626
EM	3.5843	4.3613	3.4248	3.8314	4.0826	4.3454	4.6932	3.9150	4.3211

Table 18 Summary of Estimated Standard Deviations

Summary of Estimated Standard Deviations

	TSCE1	TSCE2	TSCE3	TSCE4	TSCE5	TSCE6	TSCE7	TSCE8	TSCE9
All Values	2.49206	2.72665	2.53289	2.68681	2.66015	2.77700	2.67859	2.73992	2.85278
EM	2.49206	2.72789	2.52995	2.71237	2.65644	2.79343	2.70646	2.74458	2.86226

Both exploratory and confirmatory factor analysis are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman,

1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should be normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms and P-P plots (refer Figures below) would indicate some important departures from normality with all variables. This has implications for the estimation techniques used in the confirmatory factor analysis in particular.

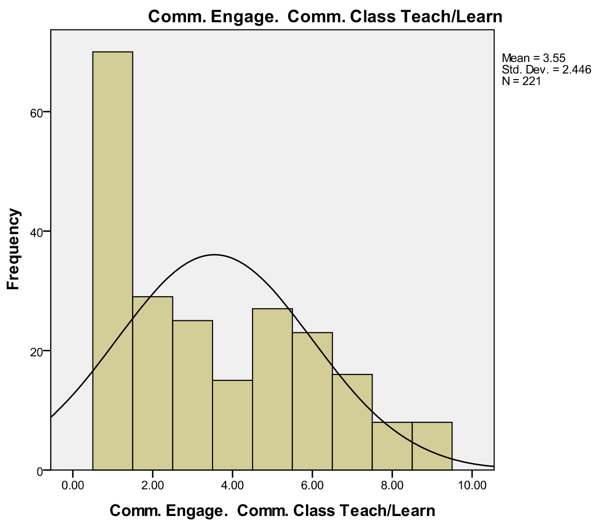


Figure 28 **Histogram - Indigenous Community Class Teach/Learn**

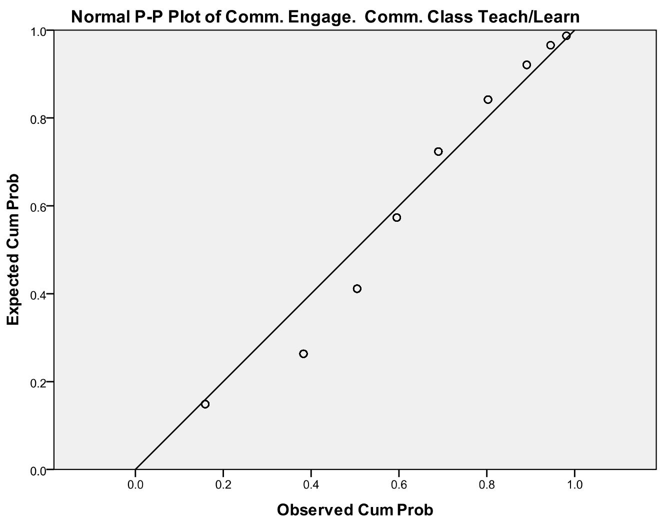


Figure 29 **P-P Plot - Indigenous Community Class Teach/Learn**

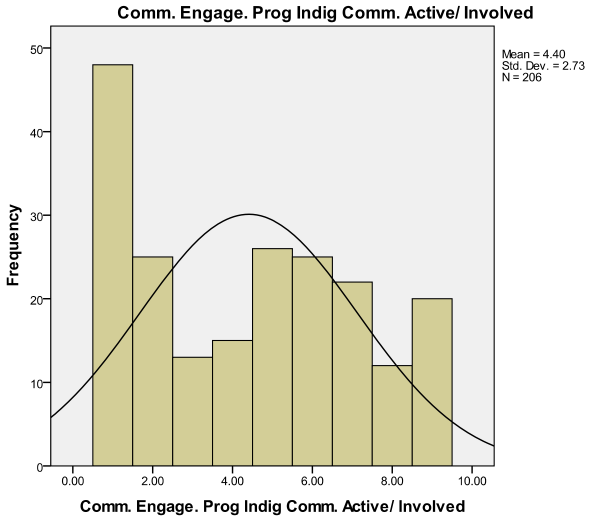


Figure 30 **Histogram - Indigenous Community Active/Involved**

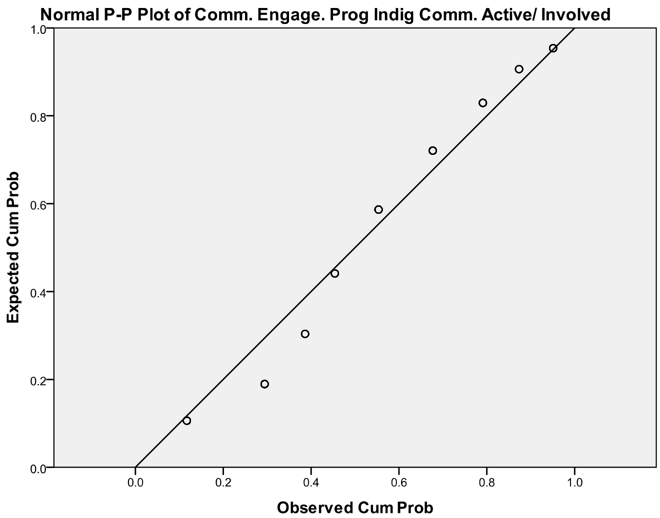


Figure 31 **P-P Plot - Indigenous Community Active/Involved**

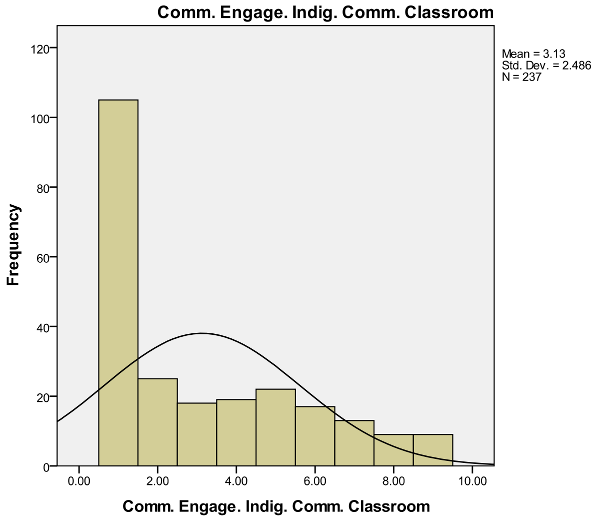


Figure 32 **Histogram - Indigenous Community Classroom**

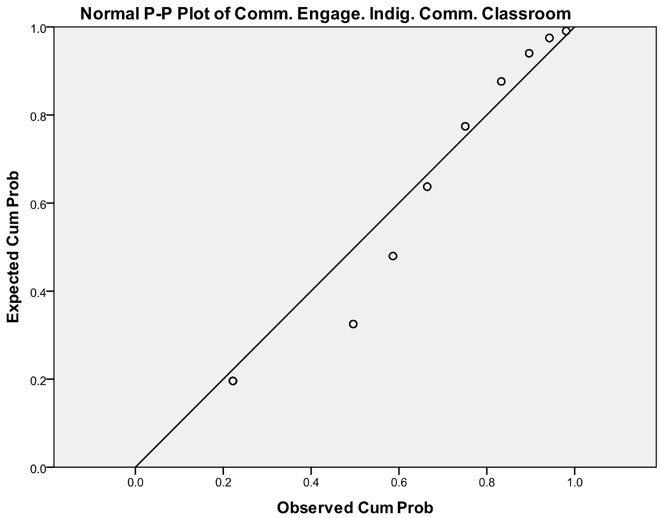


Figure 33 **P-P Plot - Indigenous Community Classroom**

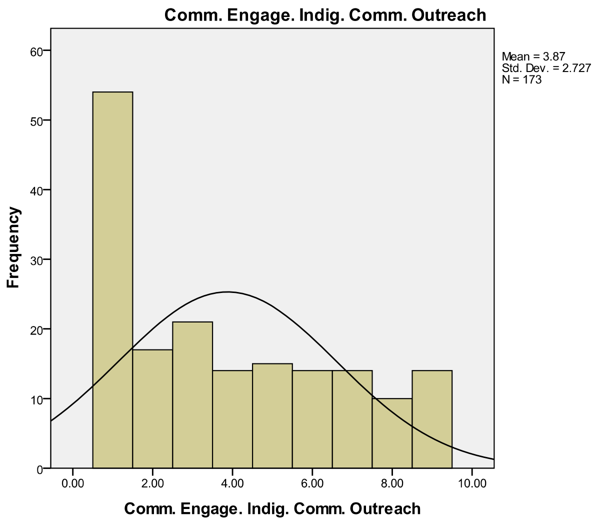


Figure 34 **Histogram - IndeginousCommunity Outreach**

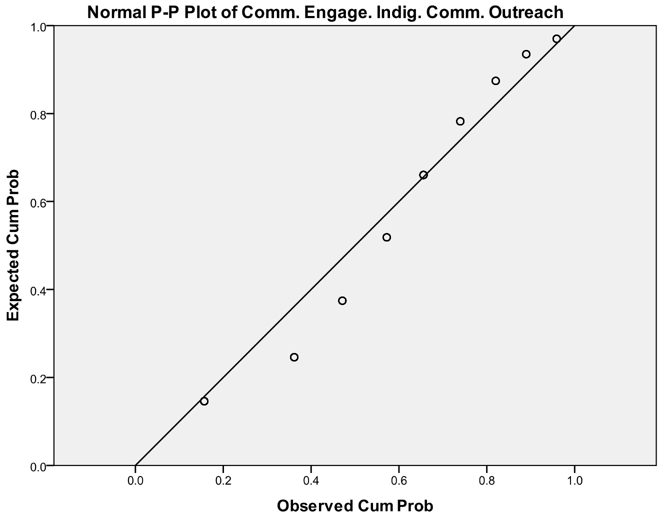


Figure 35 **P-P Plot - Indigenous Community Outreach**

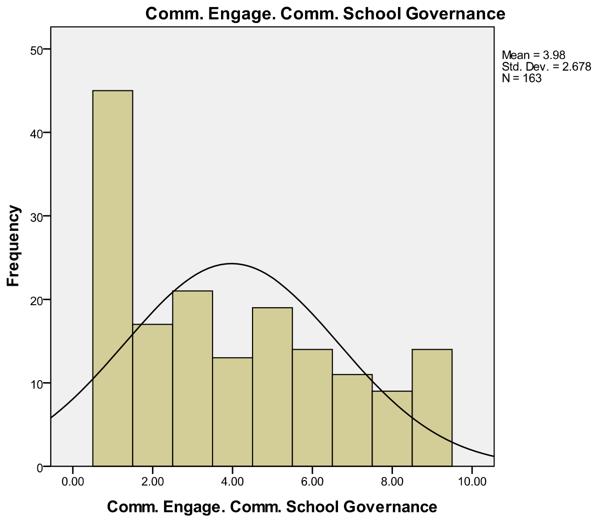


Figure 36 **Histogram - Community School Governance**

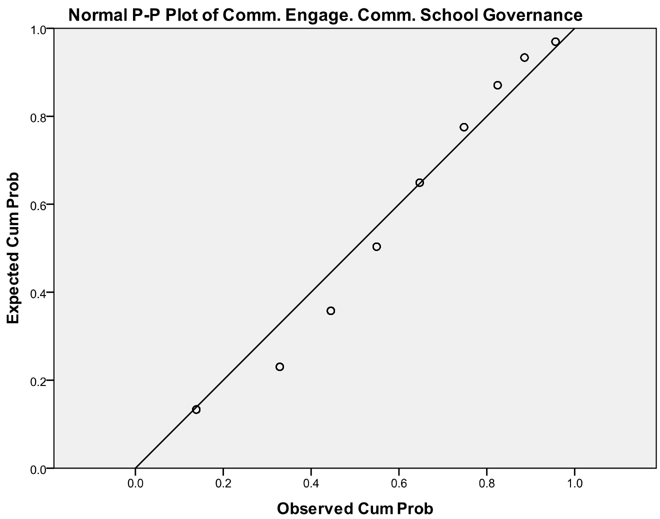


Figure 37 **P-P Plot - Community School Governance**

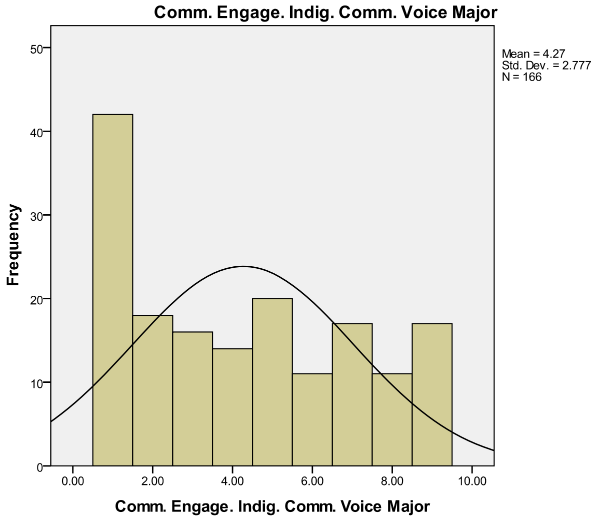


Figure 38 **Histogram - Indigenous Community Voice Major**

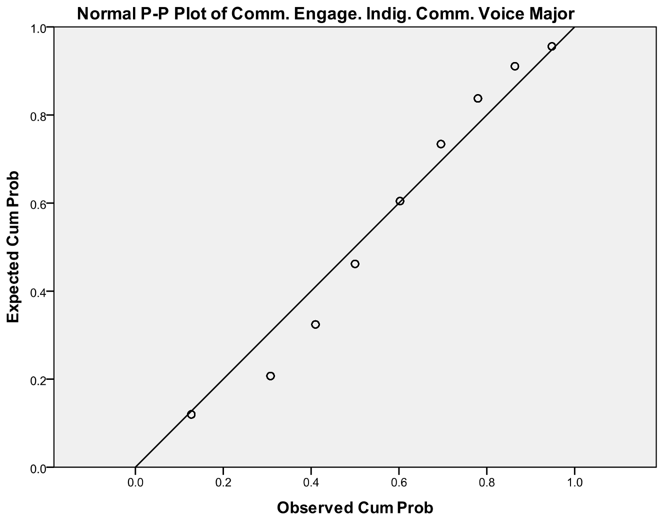


Figure 39 **P-P Plot - Indigenous Community Voice Major**

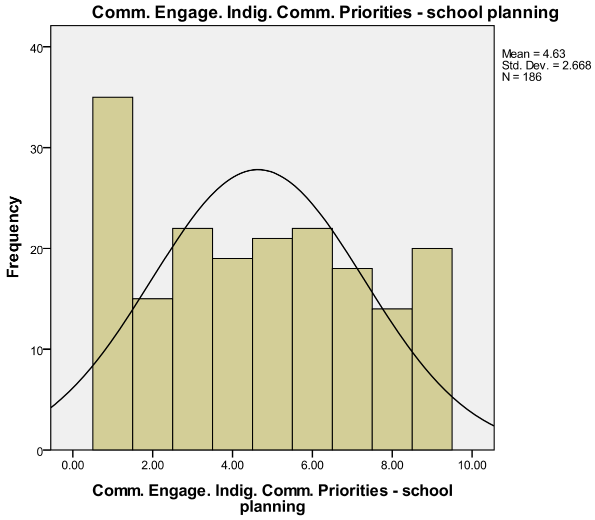


Figure 40 **Histogram - Indigenous Community Priorities – School Planning**

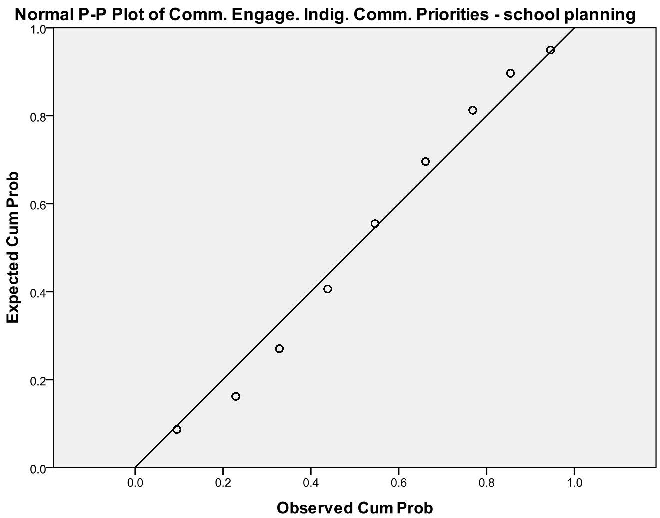


Figure 41 **P-P Plot - Indigenous Community Priorities – School Planning**

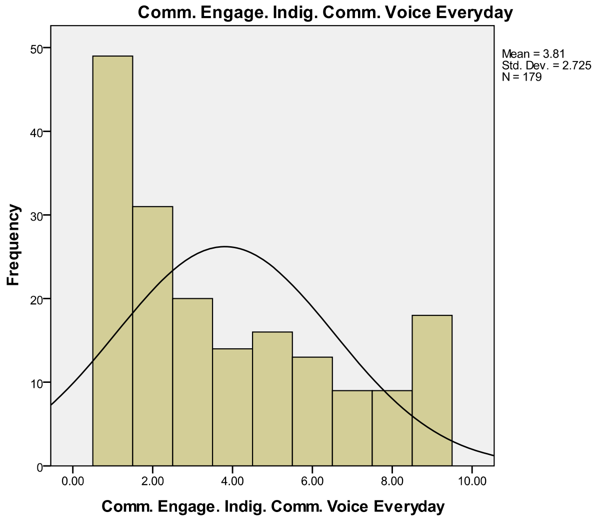


Figure 42 **Histogram - Indigenous Community Voice Everyday**

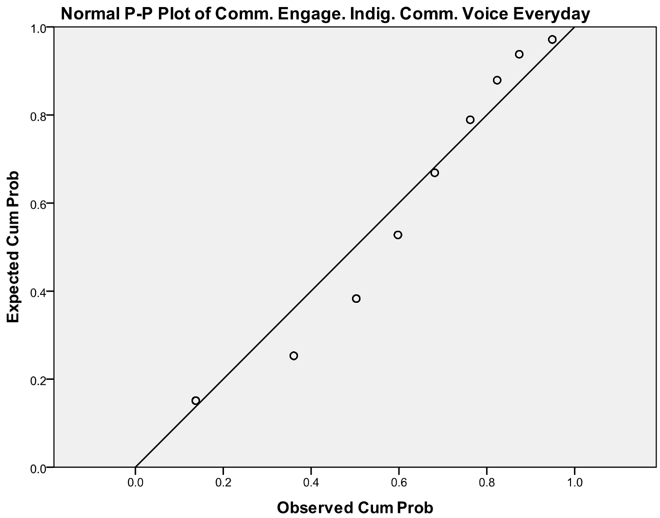


Figure 43 **P-P Plot - Indigenous Community Voice Everyday**

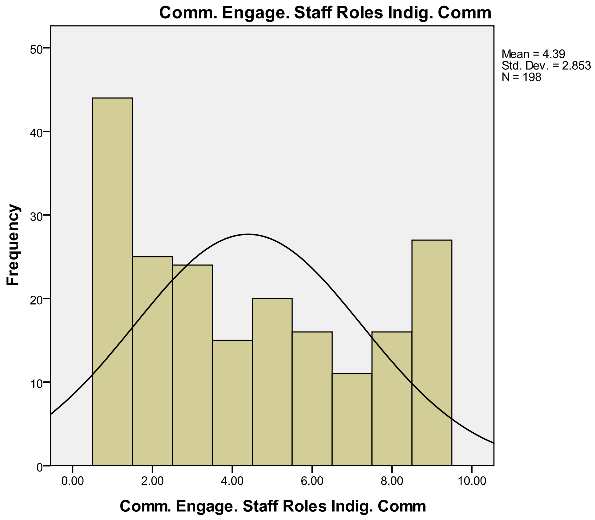


Figure 44 **Histogram - Staff Roles Indigenous Community**

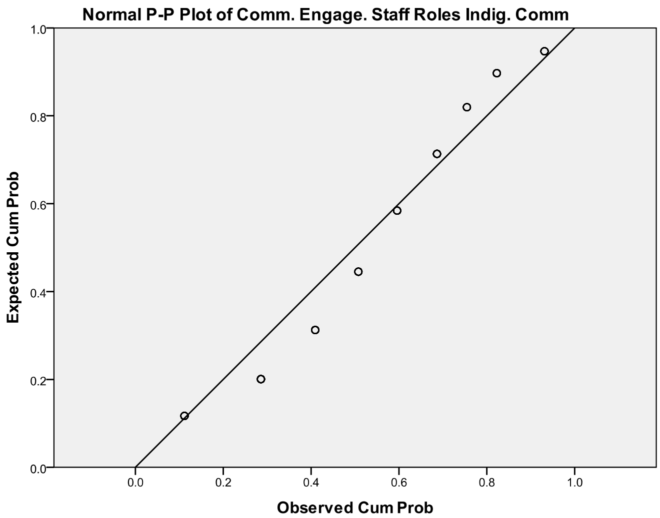


Figure 45 **P-P Plot - Staff Roles Indigenous Community**

The measurement model

Given the sample used in this analysis is drawn from a constrained population (teachers) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis

As indicated previously much of the data follows a non normal distribution but as the factor analysis is being used in a descriptive way to summarise relationships, assumptions in regards to normal data may be relaxed as long as the deviation is not too large (Tabachnick & Fidell, 2007).

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 19).

Table 19 Correlation Matrix

	TSCE1	TSCE2	TSCE3	TSCE4	TSCE5	TSCE6	TSCE7	TSCE8	TSCE9
TSCE1	1.000								
TSCE2	.622	1.000	.						
TSCE3	.536	.423	1.000						
TSCE4	.522	.617	.530	1.000					
TSCE5	.501	.642	.427	.557	1.000				
TSCE6	.471	.572	.347	.474	.660	1.000			
TSCE7	.524	.523	.448	.555	.712	.769	1.000		
TSCE8	.524	.547	.386	.522	.657	.855	.735	1.000	
TSCE9	.494	.561	.384	.518	.692	.678	.664	.709	1.000

The correlation matrix (refer Table 19) shows the majority of the correlations are greater than 0.4 and most variables have a medium to large correlation with at least 2 or 3 other variables and all are significant. This would suggest there may be some basis for applying an EFA.

Table 20 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.892
Bartlett's Test of Sphericity	Approx. Chi-Square	1102.940
	df	36
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 1102.940 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.892 would suggest there is probably a factor structure underlying the variables (refer Table 20).

Table 21 Communalities

Communalities

	Initial	Extraction
TSCE1	.517	.404
TSCE2	.605	.490
TSCE3	.387	.260
TSCE4	.520	.427
TSCE5	.652	.651
TSCE6	.791	.756
TSCE7	.704	.722
TSCE8	.777	.765
TSCE9	.610	.639

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 21) would indicate a reasonable level of variation (small < 0.3) in the items is being explained the latent factor. Specifically between 26% and 76% of the variance in items is being explained by the underlying factor structure. Of concern is the extraction in many cases is explaining less variance in an item than the initial model i.e. a model which uses a linear combination of all other items as a predictor of the item in question.

Table 22 Total Variance Explained

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.567	61.858	61.858	5.114	56.824	56.824
2	.986	10.954	72.812			
3	.567	6.305	79.117			
4	.491	5.460	84.577			
5	.396	4.404	88.981			
6	.340	3.773	92.754			
7	.315	3.498	96.252			
8	.214	2.374	98.626			
9	.124	1.374	100.000			

The above table (refer Table 22) shows that only one of the eigenvalues exceeds one – as a result 1 factor will be extracted. Factor 1 is accounting for ~ 62% of the total variance of 9 (9 because we have 9 variables and the variance for each variable has been standardised to 1). However there is a hint of another factor with an eigenvalue of .986 – this is only marginally below the cut off of 1.

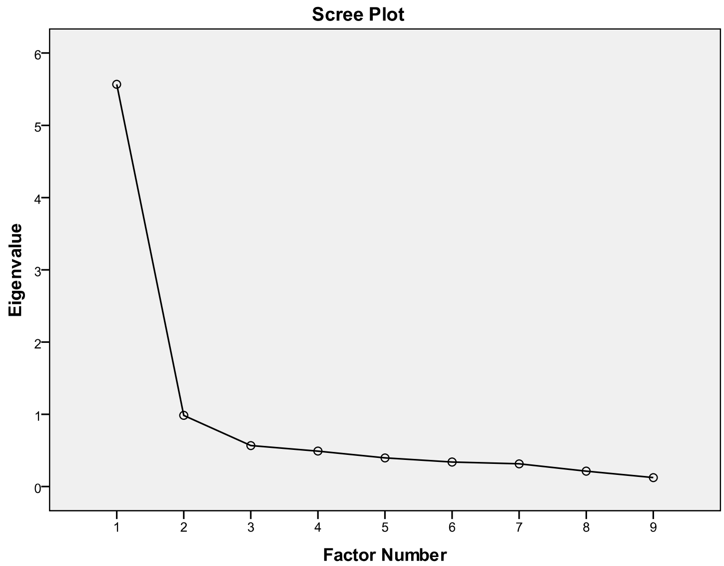


Figure 46 Scree Plot

Examination of the scree plot (refer Figure 46) would indicate a one factor solution is appropriate however it could be argued a second factor is present.

Given the concern over the communalities (refer Table 23) and the indication of a second factor being present the EFA was re run while forcing a 2 factor solution.

Table 23 Communalities

Communalities

	Initial	Extraction
TSCE1	.517	.543
TSCE2	.605	.606
TSCE3	.387	.423
TSCE4	.520	.589
TSCE5	.652	.646
TSCE6	.791	.887
TSCE7	.704	.709
TSCE8	.777	.822
TSCE9	.610	.619

The variance explained by the factor solution is now in most cases more than that explained by the initial solution - a definite improvement.

Table 24 Factor Matrix

Factor Matrix

	Factor	
	1	2
TSCE6	.910	-.243
TSCE8	.894	-.149
TSCE7	.842	
TSCE5	.786	.169
TSCE9	.784	
TSCE2	.696	.350
TSCE4	.640	.423
TSCE1	.624	.392
TSCE3	.494	.423

The factor matrix (refer Table 24) gives the factor loadings for each item on the underlying constructs. It is clear all items load well on at least one factor.

Table 25 Rotated Factor Matrix

Rotated Factor Matrix

	Factor	
	1	2
TSCE6	.901	.274
TSCE8	.838	.346
TSCE7	.711	.451
TSCE9	.632	.469
TSCE5	.578	.558
TSCE4	.321	.697
TSCE2	.406	.664
TSCE1	.324	.662
TSCE3	.197	.620

The rotated factor matrix (refer Table 25) indicates a clear 2 factor solution with TSCE6 – TSCE9 loading on factor 1 and TSCE1 – TSCE4 loading on factor 2. TSCE5 is cross loading on both factors.

A key assumption underlying the use of confirmatory factor analysis is that the observations are drawn from a continuous and multivariate population. A consequence of contravening this assumption ,if maximum likelihood estimation is used, is the chi-square goodness of fit test will not produce an accurate estimate of fit, rejecting true models and parameter estimates will be biased yielding too many significant results (Anderson & Gerbing, 1988). Even if all univariate distributions are normal (which is not the case in this instance) the joint distributions of the variables may depart substantially from multivariate normality. Mardia's coefficient was used as an indicator of degree of multivariate normality (Mardia, 1970).

Table 26 Assessment of normality (Group number 1)

Assessment of normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
TSCE7	1.000	9.000	.073	.398	-1.250	**-3.405**
TSCE5	1.000	9.000	.387	**2.107**	-1.029	**-2.803**
TSCE4	1.000	9.000	.502	**2.735**	-1.015	**-2.765**
TSCE3	1.000	9.000	.679	**3.699**	-.729	**-1.987**
TSCE2	1.000	9.000	.202	1.098	-1.271	**-3.462**
TSCE9	1.000	9.000	.355	**1.933**	-1.272	**-3.464**
TSCE8	1.000	9.000	.571	**3.111**	-.972	**-2.647**
TSCE6	1.000	9.000	.273	1.487	-1.266	**-3.449**
TSCE1	1.000	9.000	.506	**2.755**	-1.030	**-2.806**
Multivariate					**41.453**	**19.652**

The bolded figures (refer Table 26) in the table indicate variables whose distributions depart significantly from normal either by displaying skewness or kurtosis or both. Mardia's coefficient has a value of 41.453 which suggests a moderate to large deviation from multivariate normality is present in the data (refer Table 26).

Given the data is not multivariate normally distributed it is inappropriate to use estimation techniques that rely on this assumption for the reasons already outlined. While there are several alternatives to remedy this situation a decision was made to use the Bollen-Stine bootstrap as the appropriate solution for testing goodness of fit of the model while correcting for non normally distributed data.

Table 27 Mahalanobis Distance

Mahalanobis distance

Observation number	Mahalanobis d-squared	p1	p2
101	37.623	.000	.004
178	37.070	.000	.000
28	32.171	.000	.000
172	31.488	.000	.000
115	29.348	.001	.000

Parameter estimates can also be affected by the presence of outliers. Some top level checks for detecting outliers due to possible errors in data entry have been carried out previously. A table of Mahalanobis distances (refer Table 27) was calculated to assist in detecting outliers due to other causes. The bolded figures in the table indicate cases 101 and 178 are furthest from the centre of the distribution. However the drop in distance to the next observation (case 28) is not large so it is unlikely these cases could be considered outliers.

Confirmatory factor analysis

Factor 1

Factor one was mapped by the following items in the EFA.

Table 28 Teachers Survey Indigenous Community

TSCE5	Indigenous community members meet regularly with school governance boards (e.g., councils and leadership groups, P&C/P&F committees).
TSCE6	Indigenous community members are consulted on major decisions about the direction of the school.
TSCE7	Indigenous community priorities are taken into account as part of the school planning process.
TSCE8	Indigenous community members have a voice in the everyday running of the school.
TSCE9	School staff have significant roles in meetings and events that involve the Indigenous community.

TSCE5 cross loaded almost equally on both factor 1 (refer Table 28) and factor 2. The item has initially been included in the factor 1 model as it loaded slightly higher on factor 1 in the EFA and could not be excluded on substantiative grounds.

Table 29 Sample Correlations (Group number 1)

	TSCE9	TSCE8	TSCE7	TSCE6	TSCE5
TSCE9	1.000				
TSCE8	.709	1.000			
TSCE7	.664	.735	1.000		
TSCE6	.678	.855	.769	1.000	
TSCE5	.692	.657	.712	.660	1.000

Condition number = 27.689
Eigenvalues
3.856 .424 .340 .241 .139

The sample correlations (refer Table 29) ranged from a low of 0.664 to a high of 0.855 suggesting item redundancy is not a problem. The eigenvalues would suggest a one factor solution.

A single factor congeneric measurement model was constructed and tested for fit using the Bollen-Stine bootstrap as the estimation engine. A single factor congeneric model of Community Engagement Factor 1 (refer Figure 47) was specified as a latent variable with 5 reflective indicators. It is normal in a congeneric measurement model to set the scale of the latent variable by fixing the variance of the construct to one rather than the usual practice of setting a factor loading to 1. However when boot strapping is applied this may result in incorrect standard errors being generated. Consequently the factor loading of the TSCE6 item was set to one to scale the latent variable as this item had the highest factor loading in the EFA. The model with standardised parameters is illustrated below.

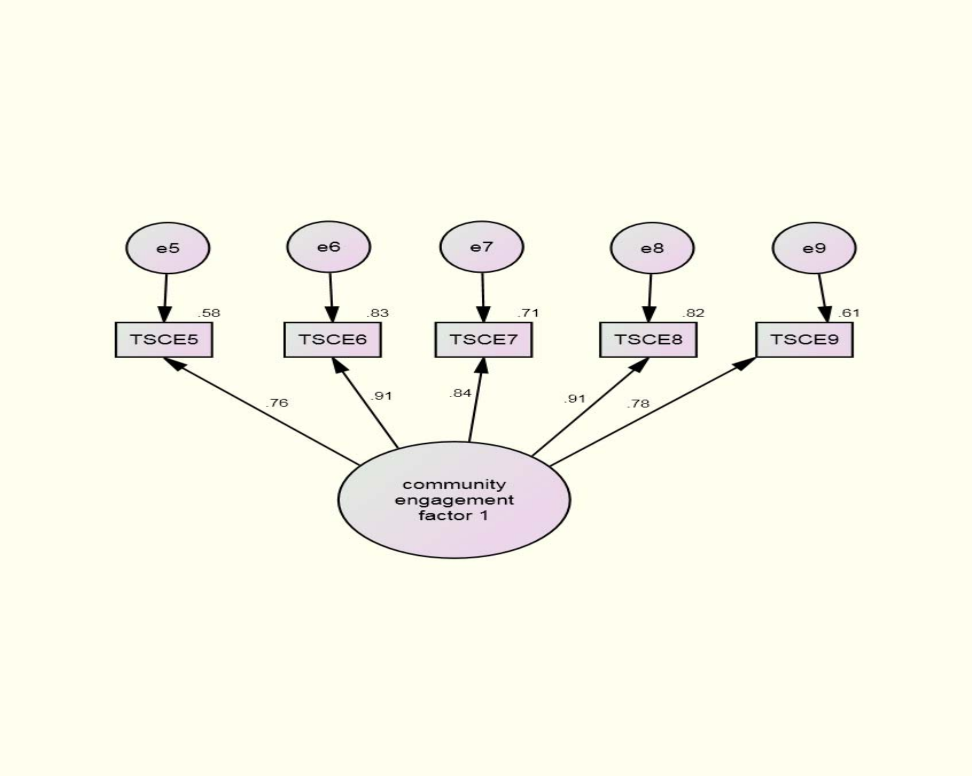


Figure 47 **Community Engagement – Factor 1**

The model converged but did not fit the data Bollen-Stine bootstrap p = 0.025. The factor coefficients ranged from a low of 0.76 to a high of 0.91. All coefficients exceed 0.4 so on this basis all items would be retained if the model was a good fit.

An examination of the modification index (MI) indicated the chi square value would decrease by at least 8 units if the covariance of the error terms associated with the indicators TSCE5 and TSCE7 was freely estimated. An examination of the standardised residual covariance matrix indicated TSCE5 was not a good fit so as a preliminary measure TSCE5 was dropped from the model.

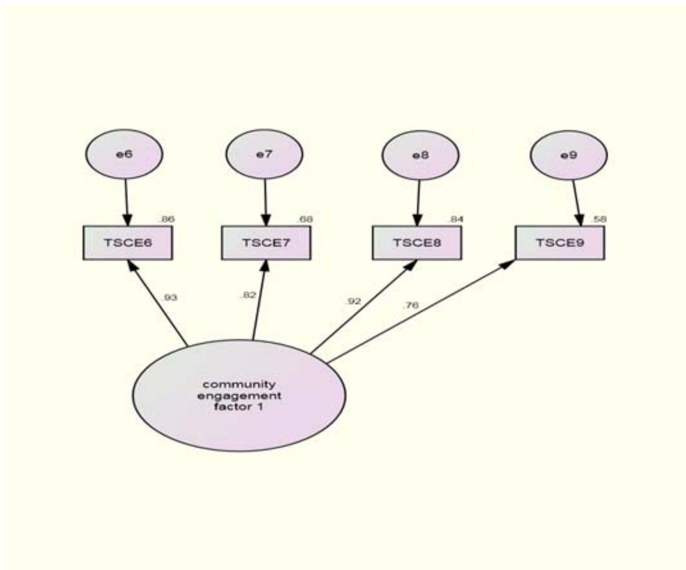


Figure 48 **Community Engagement – Factor 1 Model (Model coverged)**

The model converged (refer Figure 48) and was a good fit. The factor coefficients ranged from a low of .76 to a high of .93.

In summary - a one factor congeneric model of the latent construct Community Engagement Factor 1 was respecified as a latent variable with 4 reflective indicators. The data fit the model well Bollen-Stine bootstrap p = 0.441, RMSEA = .115 (.025, .216), GFI = .983, TLI = .974 and CFI = .991.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case the parallel model (Bollen-Stine bootstrap p = 0.025) did not fit the data well and the tau model (Bollen-Stine bootstrap p = 0.078) did fit the data but not as well as the congeneric model so that model was retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). The SMCs for the indicator variables mapped by the Community Engagement factor 1 were TSCE6 (.93), TSCE7 (.82), TSCE8 (.92) and TSCE9(.76)- all are above the "good" cut-off .

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the Community Engagement Factor 1 was .76. In other words the factor is accounting in total for 76% of the variation in the indicator variables which is well above the recommended cut off of 50%.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for Community Engagement Factor 1 is .91; well above the recommended cut off.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Community Engagement Factor 1 model was .94 which represents a high reliability (Hancock & Mueller) .

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The Community Engagement Factor 1 model fitted well as confirmed by the non significant Bollen-Stine bootstrap p supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were TSCE6 (NA), TSCE7 (15.536), TSCE8 (19.726) and TSCE9 (13.288) - all of which are significant at the .05 level which support a claim for convergent validity.

Index Score

A scale score for the factor 1 construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression (refer Table 30) coefficient of each indicator and summing.

Table 30 Regression Weights

	TSCE6	TSCE7	TSCE8	TSCE9
Raw regression weights	.380	.153	.345	.102
Proportional regression weights	.388	.156	.352	.104

The scale score then becomes:

Community Engagement Factor 1 score = (TSCE6*.388) +(TSCE7*.156) + (TSCE8*.352) + (TSCE9*.104)

This approach ensures the estimates of the scale score adjusted for measurement error is proportionally weighted by the actual contribution made by each indicator. The proportional regression weight scores sum to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same 'metric' as that of indicators for the construct.

A review of the items mapping the construct would indicate the factor 1 construct would be better named School *Governance and Community*.

Factor 2

Factor two was mapped by the following items in the EFA.

Table 31 Teachers Survey Indigenous Community

TSCE1	Indigenous community members participate in classroom teaching or student learning.
TSCE2	There is a program to encourage Indigenous community members to become actively involved in the school.
TSCE3	I involve Indigenous community members in my classroom.
TSCE4	An outreach program is maintained to reach out to Indigenous parents/caregivers who do not visit the school.
TSCE5	Indigenous community members meet regularly with school governance boards (e.g., councils and leadership groups, P&C/P&F committees).

TSCE5 (refer Table 31) cross loaded almost equally on both factor 1 and factor 2 in the EFA. The item was initially included in the indicator set for factor 1 but did not fit the model well. It is included in this model (refer Table 31) to see if it is a better fit with factor two items.

Table 32 Sample Correlations (Group number 1)

Sample Correlations (Group number 1)

	TSCE5	TSCE4	TSCE3	TSCE2	TSCE1
TSCE5	1.000				
TSCE4	.557	1.000			
TSCE3	.427	.530	1.000		
TSCE2	.642	.617	.423	1.000	
TSCE1	.501	.522	.536	.622	1.000

The sample correlations (refer Table 32) ranged from a low of 0.501 to a high of 0.642 suggesting item redundancy is not a problem. The eigenvalues would suggest a one factor solution.

A single factor congeneric measurement model was constructed and tested for fit using the Bollen-Stine bootstrap as the estimation engine. A single factor congeneric model of Community Engagement Factor 2 (refer Figure 49) was specified as a latent variable with 5 reflective indicators. It is normal in a congeneric measurement model to set the scale of the latent variable by fixing the variance of the construct to one rather than the usual practice of setting a factor loading to 1. However when boot strapping is applied this may result in incorrect standard errors being generated. Consequently the factor loading of the TSCE4 item was set to one to scale the latent variable as this item had the highest factor loading in the EFA. The model with standardised parameters is illustrated below.

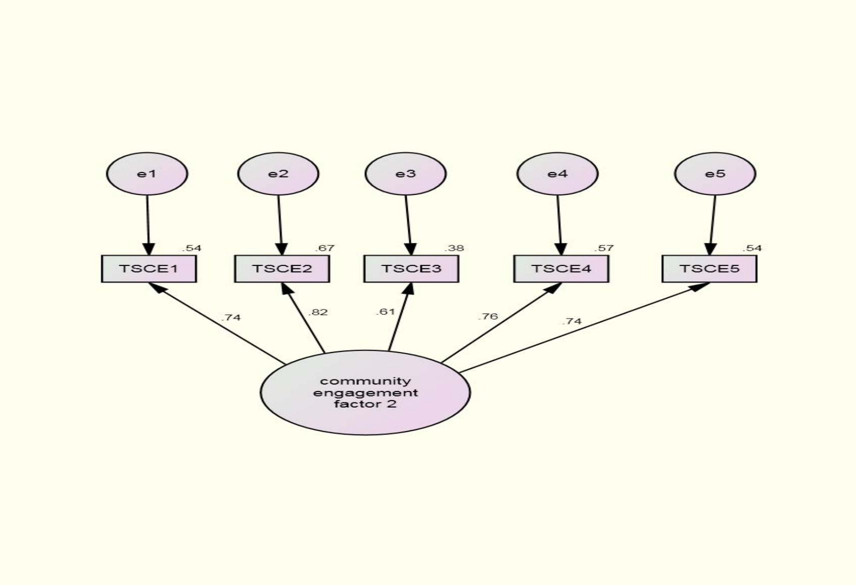


Figure 49 **Community Engagement – Factor 2**

The model converged and was a good fit. The factor coefficients ranged from a low of .61 to a high of .82.

In summary - a one factor congeneric model of the latent construct Community Engagement Factor 2 (refer Figure 49) was specified as a latent variable with 5 reflective indicators. The data fit the model well Bollen-Stine bootstrap p = 0.183, RMSEA = .128 (.071, .190), GFI = .961, TLI = .921 and CFI = .960.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case the both the parallel model (Bollen-Stine bootstrap p = 0.101) and the tau model (Bollen-Stine bootstrap p = 0.071) did fit the data but not as well as the congeneric model so that model was retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). The SMCs for the indicator variables mapped by the Community Engagement factor 2 were TSCE1 (.541), TSCE2 (.675), TSCE3 (.378), TSCE4(.571) and TSCE5(.543) - all are above the "good" cut-off except TSCE3 which is in the acceptable range.

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the Community Engagement Factor 2 was .54. In other words the factor is accounting in total for 54% of the variation in the indicator variables which is above the recommended cut off of 50%.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for Community Engagement Factor 2 is .82; above the recommended cut off.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Community Engagement Factor 2model was .87 which represents a high reliability (Hancock & Mueller) .

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The Community Engagement Factor 2 model fitted well as confirmed by the non significant Bollen-Stine bootstrap p supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were TSCE1 (9.378), TSCE2 (10.38), TSCE3 (7.785), TSCE4 (NA) and TSCE5 (9.343)(refer Table 33) - all of which are significant at the .05 level which support a claim for convergent validity.

Index score
A scale score for the factor 2 construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression (refer table 33) coefficient of each indicator and summing.

Table 33 Regression Weights

	TSCE1	TSCE2	TSCE3	TSCE4	TSCE5
Raw regression weights	.736	.821	.614	.755	.737
Proportional regression weights	.201	.224	.168	.206	.201

The scale score then becomes:

Community Engagement Factor 2 score = (TSCE1*.201) + (TSCE2*.224) + (TSCE3*.168) + (TSCE4*.206) + (TSCE5*.201)

A review of the items mapping the construct would indicate the factor 2 construct would be better named School *Community Engagement*.

Appendix 3.1.3 High Expectations Leadership Measurement Model

Table 34 High Expectations Leadership Measurement Model – The Items

The Items

Item name	Description
TSHEL1	Indigenous students are challenged to achieve their potential
TSHEL2	High expectations for Indigenous student achievement are promoted in school policies
TSHEL3	High expectations for Indigenous student learning are promoted in staff meetings
TSHEL4	Staff are mentored in the importance of setting high expectations for Indigenous students
TSHEL5	The school staff takes collective responsibility for unlocking potential in Indigenous students
TSHEL6	High expectations for Indigenous student learning are embedded in my classroom context
TSHEL7	Parents of Indigenous students are consulted about high expectations for their children
TSHEL8	I contact parents/caregivers when students do not reach expected outcomes

Descriptives:

Table 35 Statistics

Statistics

		TSHEL1	TSHEL2	TSHEL3	TSHEL4	TSHEL5	TSHEL6	TSHEL7	TSHEL8
N	Valid	264	264	264	264	264	264	264	264
	Missing	0	0	0	0	0	0	0	0
Mean		7.1098	6.7462	6.2386	5.3144	5.6742	7.0417	5.6136	6.2121
Std. Error of Mean		.12505	.13871	.14767	.16159	.15812	.12544	.15742	.15416
Std. Deviation		2.03189	2.25385	2.39928	2.62549	2.56918	2.03817	2.55777	2.50484
Skewness		-1.016	-.927	-.637	-.176	-.358	-1.124	-.286	-.696
Std. Error		.150	.150	.150	.150	.150	.150	.150	.150
Kurtosis		.404	.056	-.613	-1.215	-1.073	.833	-1.075	-.673
Std. Error		.299	.299	.299	.299	.299	.299	.299	.299
Minimum		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maximum		9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00

The minimum and maximum values for each variable lie in the scale range of 1-9 (refer Table 35) respectively indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 5.31 to 7.1 on a 9 point scale with standard deviations ranging between 2.03 and 2.63. While the mean values tend toward the high end of the scale (not unexpected given the thrust of the items) the standard deviation values would suggest the response range is adequate.

Both exploratory and confirmatory factor analysis are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics (refer Table 35) are well within these bounds but a visual analysis of the histograms and P-P plots (refer Figures below) would indicate some important departures from normality with some variables. This has implications for the estimation techniques used in the confirmatory factor analysis.

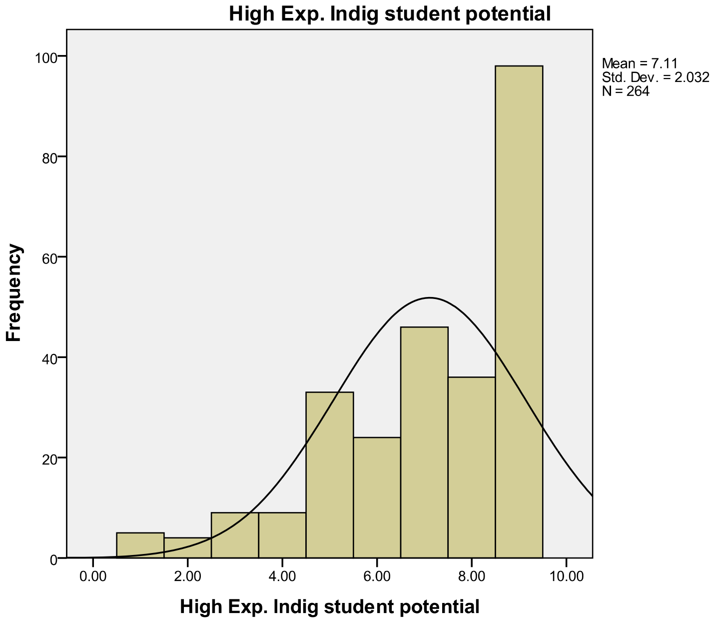


Figure 50 **Histogram - High Expectations Indigenous Student Potential**

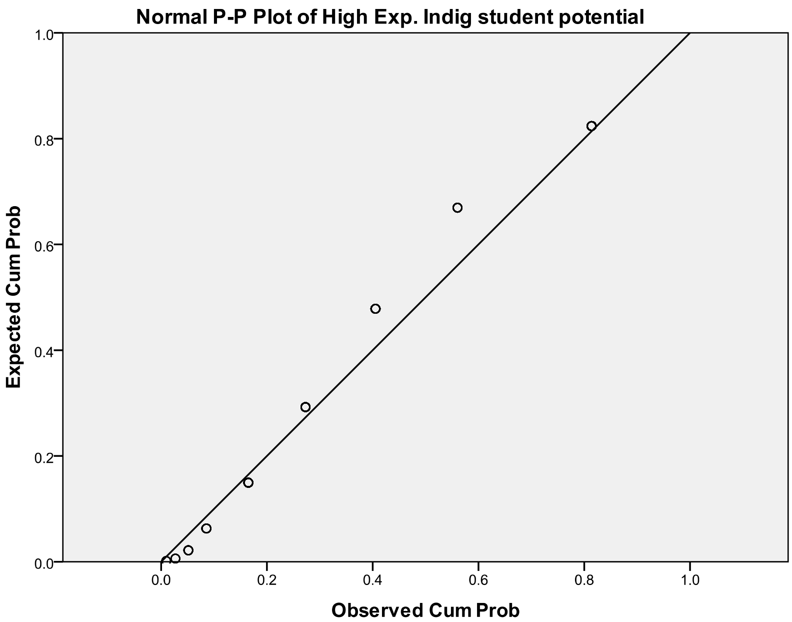


Figure 51 **P-P Plot - High Expectations Indigenous Student Potential**

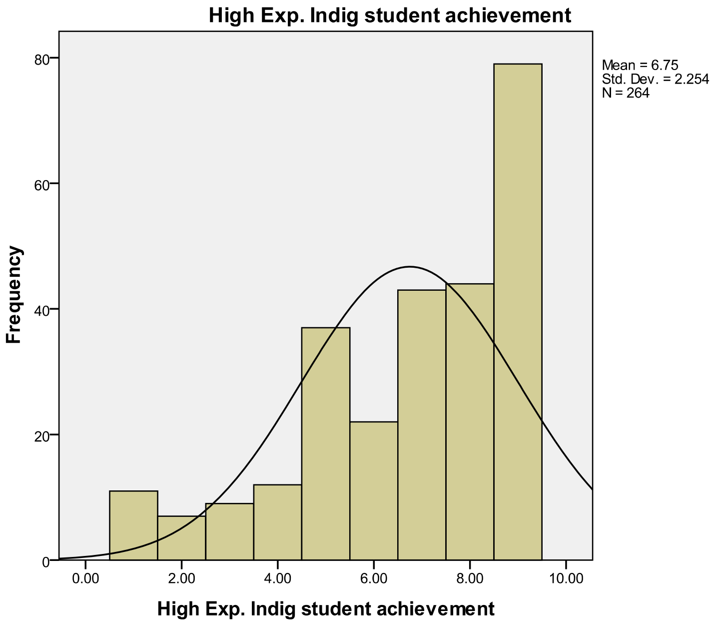


Figure 52 Histogram - High Expectations Indigenous Student Achievement

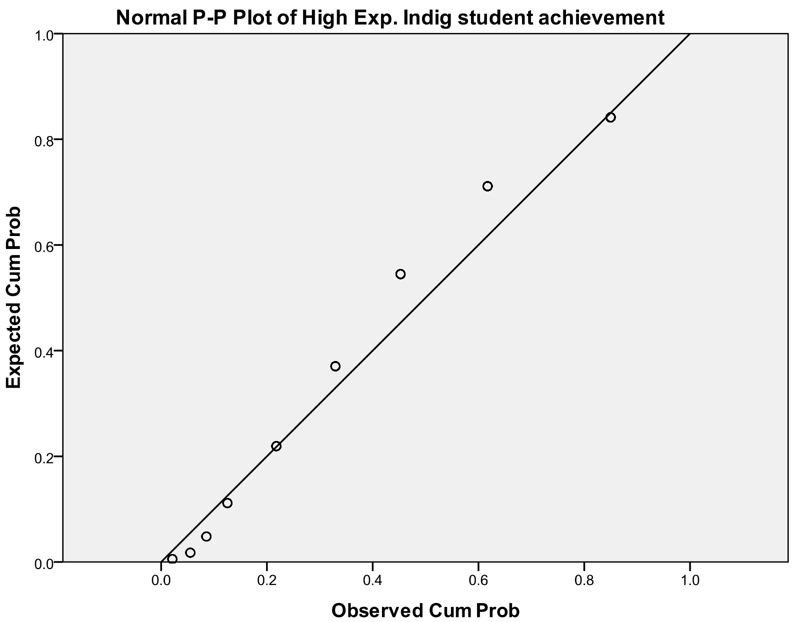


Figure 53 P-P Plot - High Expectations Indigenous Student Achievement

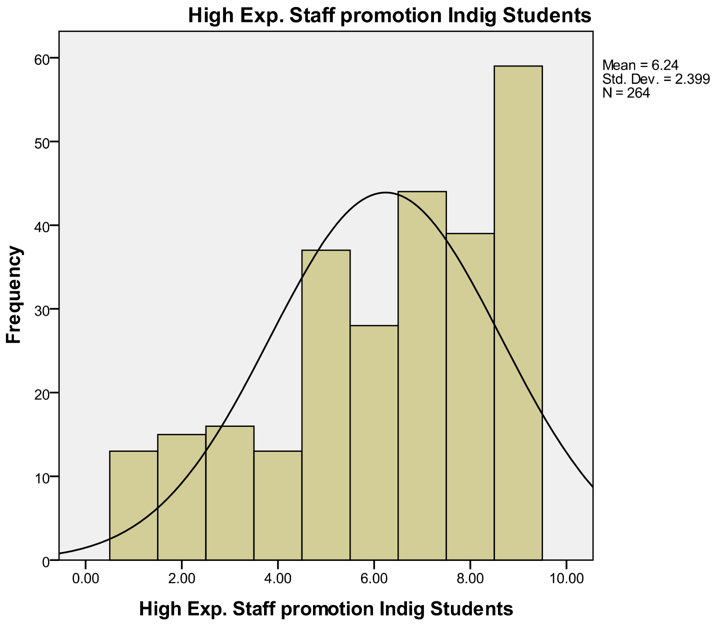


Figure 54 **Histogram - High Expectations Staff Promotion Indigenous Students**

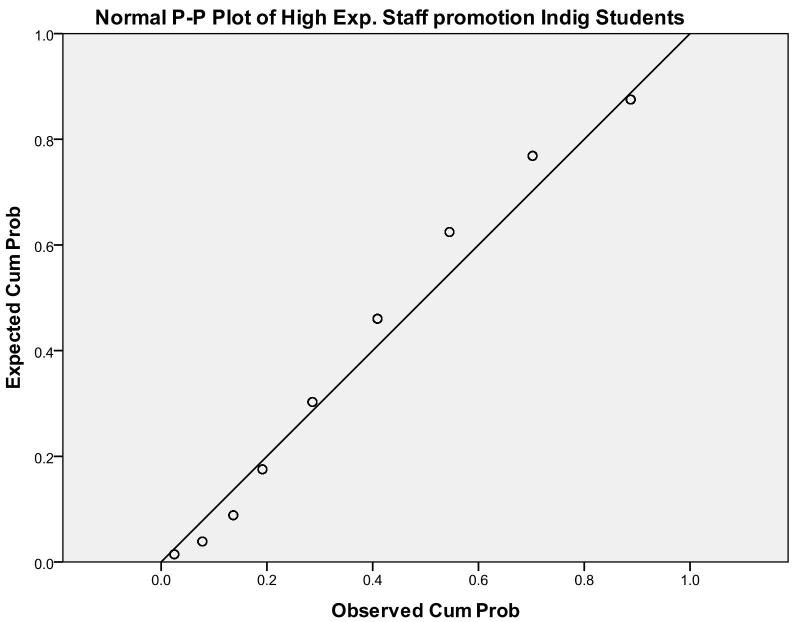


Figure 55 **P-P Plot- High Expectations Staff Promotion Indigenous Students**

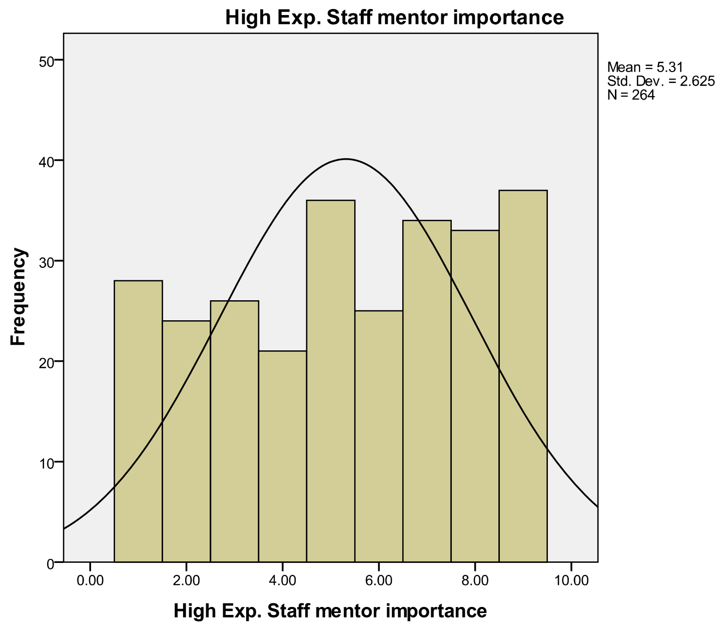


Figure 56 Histogram - High Expectations Staff Mentor Importance

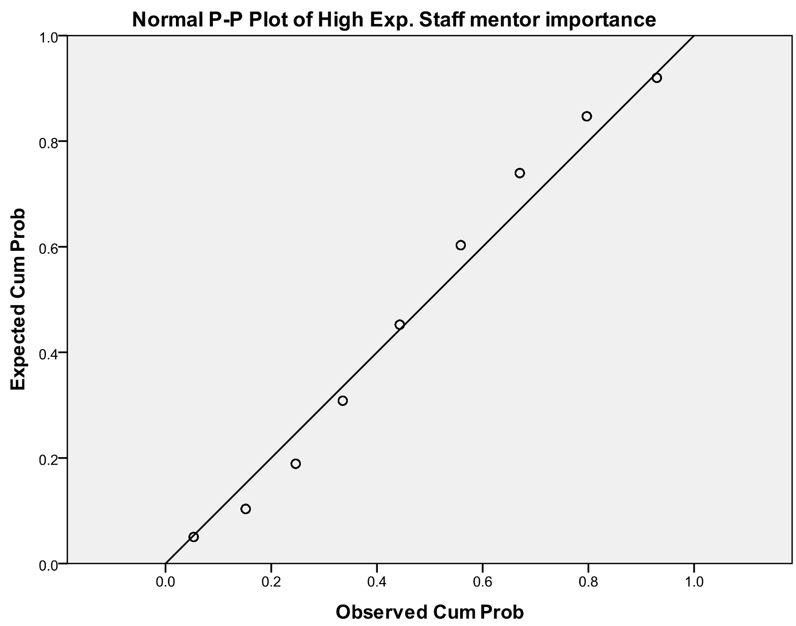


Figure 57 P-P Plot - High Expectations Staff Mentor Importance

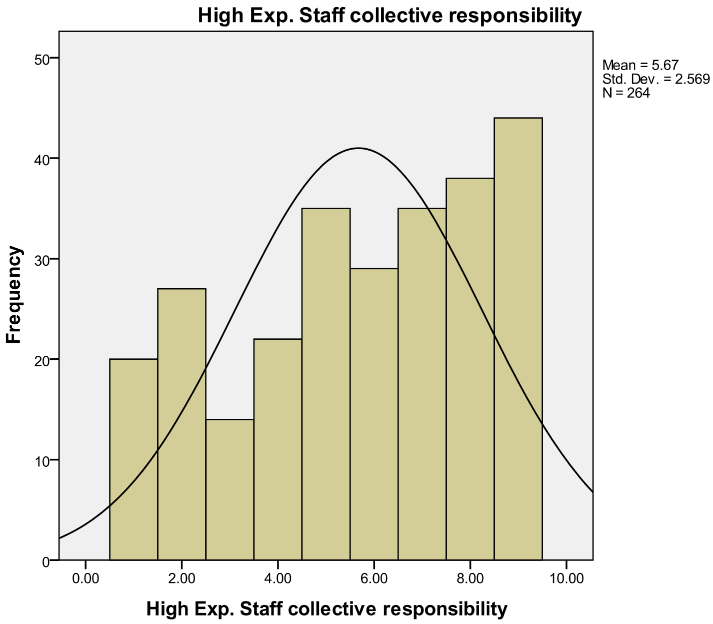


Figure 58 **Histogram - High Expectations Staff Collective Responsibility**

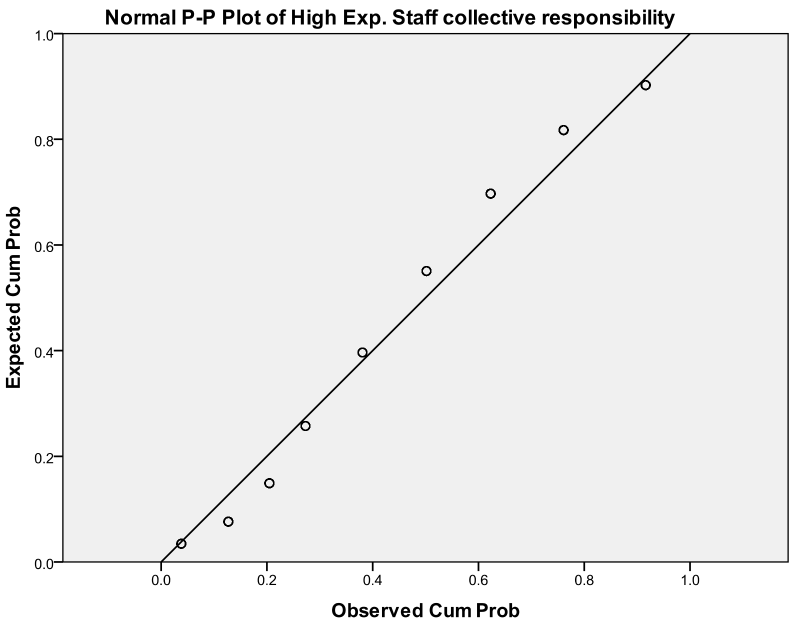


Figure 59 **P-P Plot - High Expectations Staff Collective Responsibility**

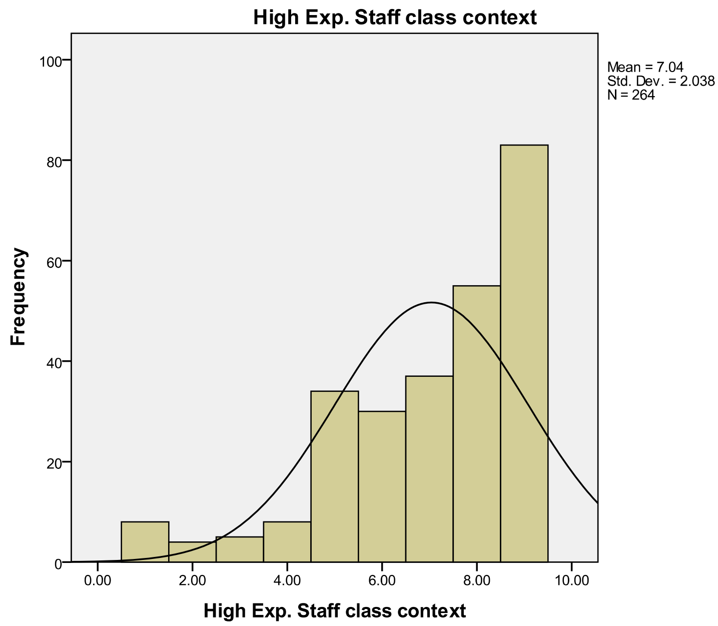


Figure 60 **Histogram - High Expectations Staff Class Context**

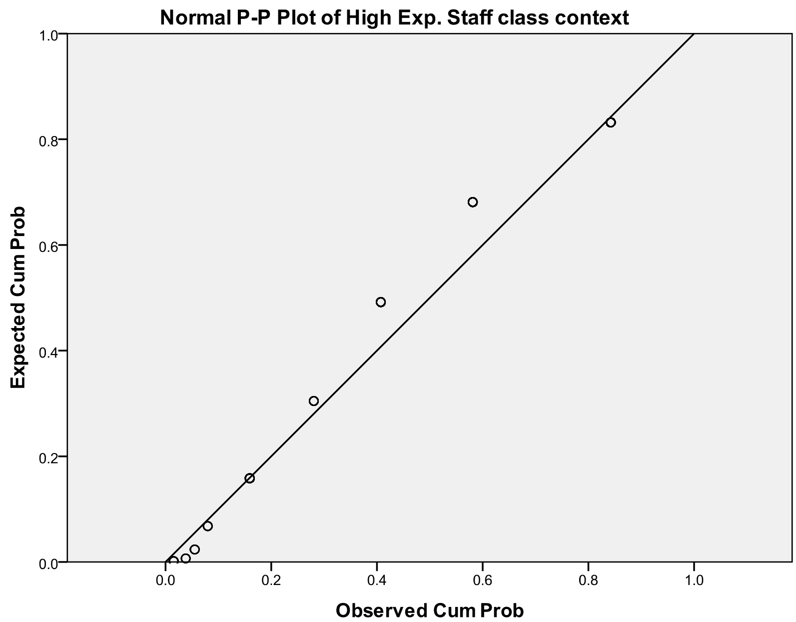


Figure 61 **P-P Plot - High Expectations Staff Class Context**

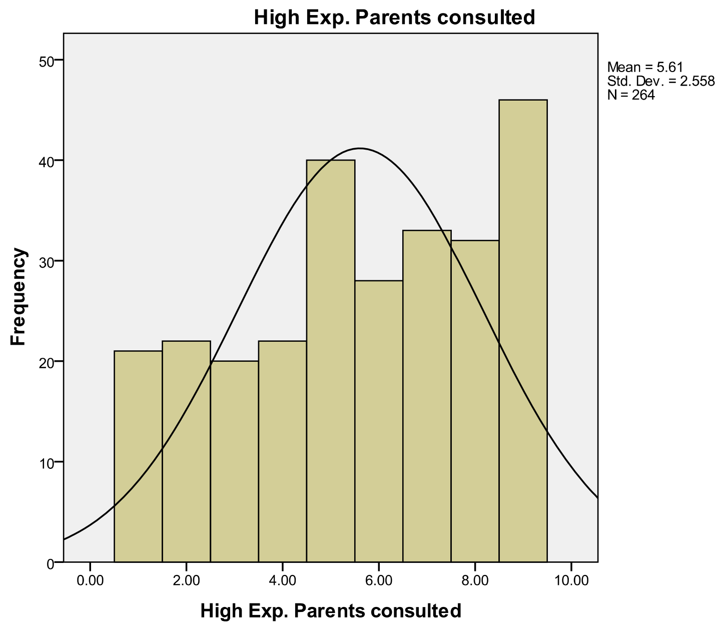


Figure 62 **Histogram - High Expectations Parents Consulted**

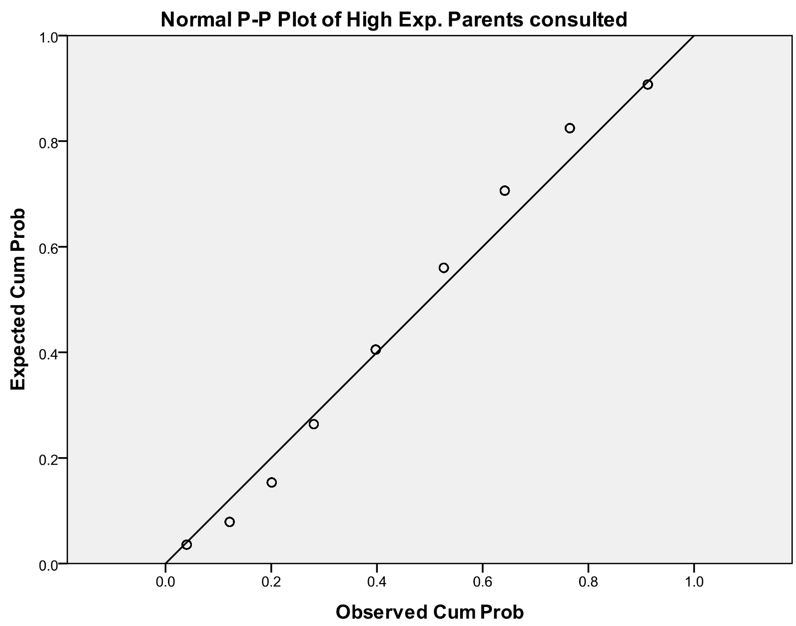


Figure 63 **P-P Plot - High Expectations Parents Consulted**

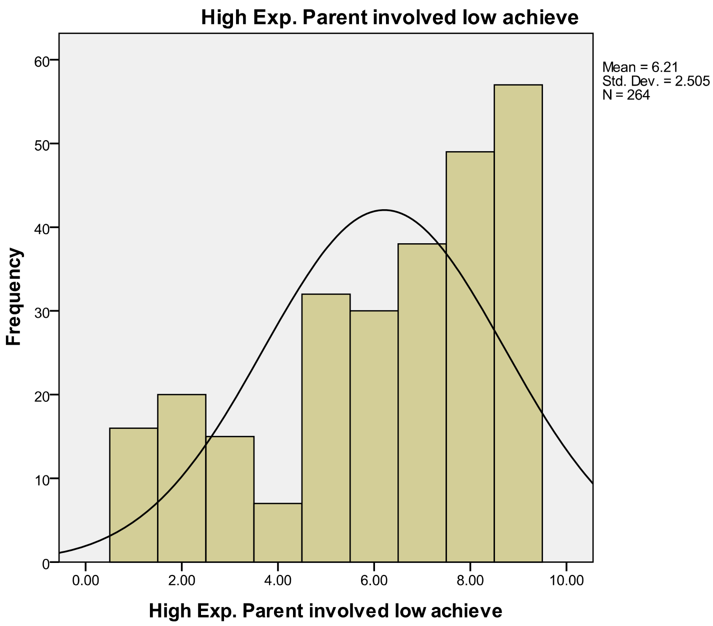


Figure 64 **Histogram - High Expectations Parent Involved Low Achieve**

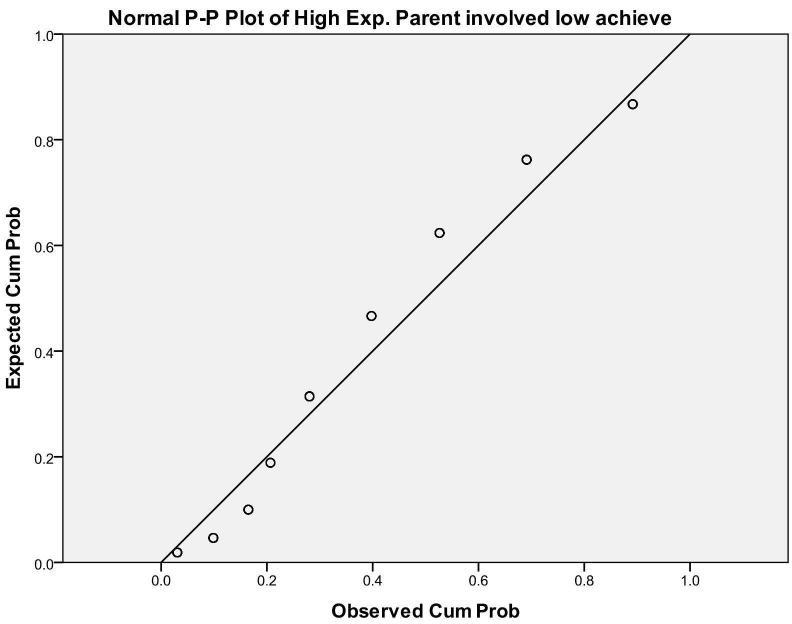


Figure 65 **P-P Plot - High Expectations Parent Involved Low Achieve**

The measurement model

Given the sample used in this analysis is drawn from a constrained population (teachers) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 36).

Table 36 **Correlation Matrix**

	TSHEL1	TSHEL2	TSHEL3	TSHEL4	TSHEL5	TSHEL6	TSHEL7	TSHEL8
TSHEL1	1							
TSHEL2	.698**	1						
TSHEL3	.512**	.741**	1					
TSHEL4	.393**	.560**	.751**	1				
TSHEL5	.451**	.527**	.633**	.723**	1			
TSHEL6	.654**	.625**	.520**	.424**	.517**	1		
TSHEL7	.472**	.580**	.643**	.652**	.595**	.529**	1	
TSHEL8	.320**	.359**	.339**	.237**	.239**	.435**	.456**	1

The correlation matrix (refer Table 36) shows the majority of the correlations are greater than 0.4 and most variables have a medium to large correlation with at least 2 or 3 other variables and all are significant (though this is not surprising given the large sample size). The only item that is a little suspect is TSHEL8. This would suggest there may be some basis for applying an EFA.

Table 37 **KMO and Bartlett's Test**

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.867
Bartlett's Test of Sphericity	Approx. Chi-Square	1283.391
	df	28
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 1283.391with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin (refer Table 37) measure of 0.867 would suggest there is probably a factor structure underlying the variables.

Table 38 Communalities

Communalities

	Initial	Extraction
TSHEL1	.570	.447
TSHEL2	.698	.668
TSHEL3	.722	.744
TSHEL4	.694	.618
TSHEL5	.591	.555
TSHEL6	.556	.471
TSHEL7	.577	.585
TSHEL8	.281	.186

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 38) would indicate a reasonable level of variation (small < 0.3) in the items is being explained by all the latent factors except for item TSHEL8. This is not surprising given the low correlations TSHEL8 had with most other items. Excluding TSHEL8 specifically between 45% and 74% of the variance in items is being explained by the underlying factor structure.

Table 39 Total Variance Explained

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.715	58.934	58.934	4.276	53.446	53.446
2	.989	12.368	71.302			
3	.768	9.599	80.901			
4	.471	5.882	86.783			
5	.351	4.384	91.167			
6	.306	3.826	94.992			
7	.229	2.857	97.850			
8	.172	2.150	100.000			

The above table (refer Table 39) shows that only one of the eigenvalues exceeds one – as a result 1 factor will be extracted. Factor 1 is accounting for ~ 59% of the total variance of 8 (8 because we have 8 variables and the variance for each variable has been standardised to 1). However there is a hint of another factor with an eigenvalue of .989 – this is only marginally below the cut off of 1.

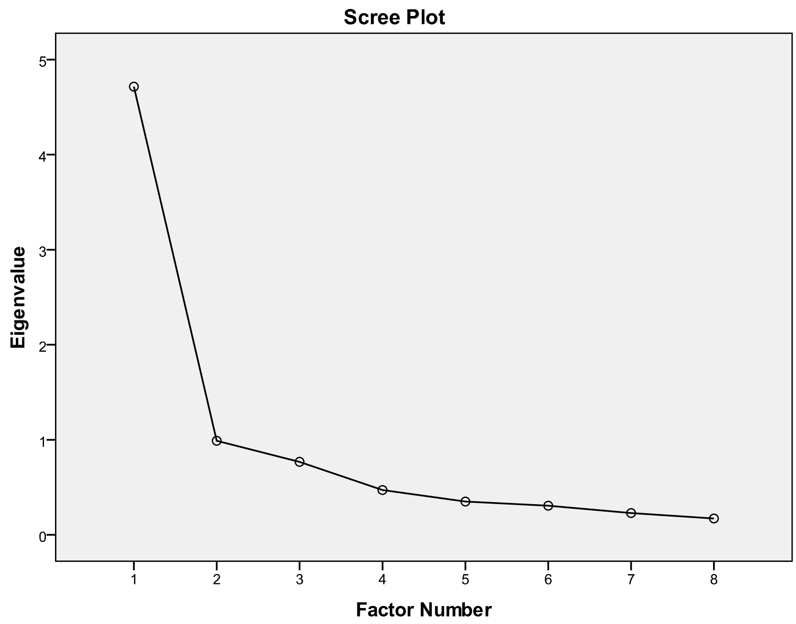


Figure 66 Scree Plot

Examination of the scree plot (refer Figure 66) would indicate a one factor solution is appropriate however it could be argued a second factor is present.

Table 40 Factor Matrix

Factor Matrix

	Factor
	1
TSHEL3	.863
TSHEL2	.817
TSHEL4	.786
TSHEL7	.765
TSHEL5	.745
TSHEL6	.686
TSHEL1	.669
TSHEL8	.432

The factor matrix (refer Table 40) gives the factor loadings for each item on the underlying construct. It is clear all items load well on the single factor except perhaps for item TSHEL8.

Confirmatory factor analysis

Single factor congeneric measurement models (refer Figure 67) was separately constructed and tested for fit. A single factor congeneric model of High Expectations Leadership (HEL) was specified as a latent variable with 8 reflective indicators. To set the scale of the latent variable the variance of the HEL construct was set to one rather than the usual practice of setting a factor loading to 1. This was done to allow a significance level to be generated for every factor loading. If a factor loading is set to one a significance level is not generated for that factor. The model with standardised parameters is illustrated (refer Figure 67).

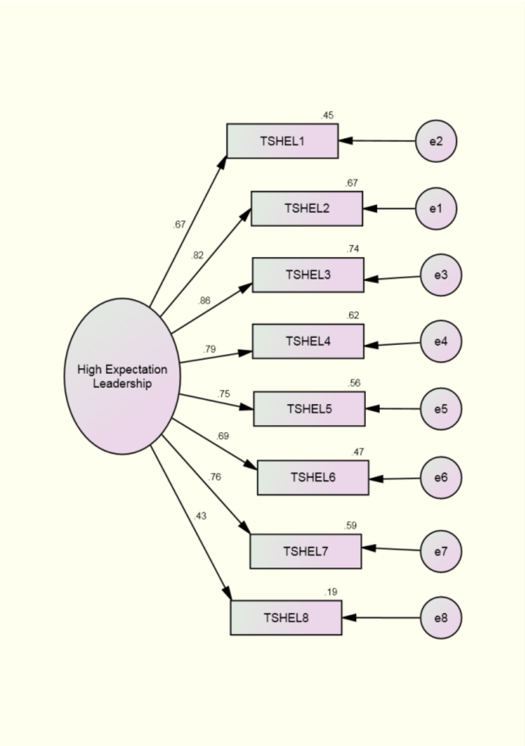


Figure 67 Measurement Model

The model (refer Figure 67) converged but did not fit the data χ^2 (20)= 232.962, p= .000. The factor coefficients ranged from a low of 0.43 to a high of 0.86. All coefficients exceed 0.4 so on this basis all items would be retained if the model (refer Figure 67) was a good fit. It was noted that TSHEL8 had the lowest R2 at 19% and the highest error variance at 5.09 tending to confirm the indications in the EFA that the item may not fit the model well.

An examination of the modifications indexes indicated that large decreases in the chi square value could be achieved if the covariances (refer Table 41) associated with a number of error terms was freely estimated.

Table 41 Covariances: (Group Number 1 – Default Model)

Covariances: (Group number 1 - Default model)

	M.I.	Par Change
e7 <--> e8	14.071	.920
e6 <--> e8	12.850	.773
e4 <--> e7	5.357	.430
e4 <--> e5	36.895	1.166
e3 <--> e4	20.526	.659
e2 <--> e6	39.529	.928
e1 <--> e6	7.786	.373
e1 <--> e3	5.966	.288
e1 <--> e2	41.507	.874

This could be a result of the measurement model not being uni dimensional. This supports the EFA findings that suggested a second factor. On substantive grounds it could be argued a group of items maps the school context while a second set are more closely aligned with classrooms. A decision was made to re run the EFA but force a two factor rotated solution.

The EFA was run initially with TSHEL8 included and then excluded from the analysis. With TSHEL8 removed the scree plot indicated a clear two factor solution. Based on this observation, previous arguments and the substantiative reason that the intent of the item does not appear to explicitly map high expectations TSHEL8 was dropped from the analysis.

Exploratory factor analysis 2 (with TSHEL 8 not included in item set)

Table 42 Correlation Matrix

Correlation Matrix

		TSHEL1	TSHEL2	TSHEL3	TSHEL4	TSHEL5	TSHEL6	TSHEL7
Correlation	TSHEL1	1.000						
	TSHEL2	.698	1.000					
	TSHEL3	.512	.741	1.000				
	TSHEL4	.393	.560	.751	1.000			
	TSHEL5	.451	.527	.633	.723	1.000		
	TSHEL6	.654	.625	.520	.424	.517	1.000	
	TSHEL7	.472	.580	.643	.652	.595	.529	1.000
Sig. (1-tailed)	TSHEL1							
	TSHEL2	.000						
	TSHEL3	.000	.000					
	TSHEL4	.000	.000	.000				
	TSHEL5	.000	.000	.000	.000			
	TSHEL6	.000	.000	.000	.000	.000		
	TSHEL7	.000	.000	.000	.000	.000	.000	

The correlation matrix (refer Table 42) shows the majority of the correlations are greater than 0.4 and most variables have a medium to large correlation with at least 2 or 3 other variables and all are significant. This would suggest there may be some basis for applying an EFA.

Table 43 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.867
Bartlett's Test of Sphericity	Approx. Chi-Square	1199.239
	df	21
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 1199.239 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.867 would suggest there is probably a factor structure underlying the variables (refer Table 43).

Table 44 **Communalities**

Communalities

	Initial	Extraction
TSHEL1	.570	.675
TSHEL2	.698	.762
TSHEL3	.721	.737
TSHEL4	.691	.895
TSHEL5	.588	.606
TSHEL6	.532	.576
TSHEL7	.536	.561

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 44) would indicate a reasonable level of variation (small < 0.3) in the items is being explained by all the latent factors. Specifically between 56% and 89% of the variance in items is being explained by the underlying factor structure. This is an improvement on the previous model both in magnitude of the variance explained and the factors accounting for more variance than the initial solution on all items.

Table 45 **Total Variance Explained**

Total Variance Explained

Factor		Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
	1	4.497	64.238	64.238	4.097	58.524	58.524	2.537	36.238	36.238
	2	.900	12.855	77.093	.713	10.193	68.716	2.273	32.479	68.716
	3	.474	6.770	83.863						
dimension0	4	.409	5.843	89.706						
	5	.319	4.551	94.257						
	6	.229	3.273	97.529						
	7	.173	2.471	100.000						

The above table (refer Table 45) shows that two factors were extracted as specified. Factor 1 is accounting for 64% of the total variance of 7 (7 because we have 7 variables and the variance for each variable has been standardised to 1). The second factor is accounting for 13% of the total variance – together they account for 77% of the total variance.

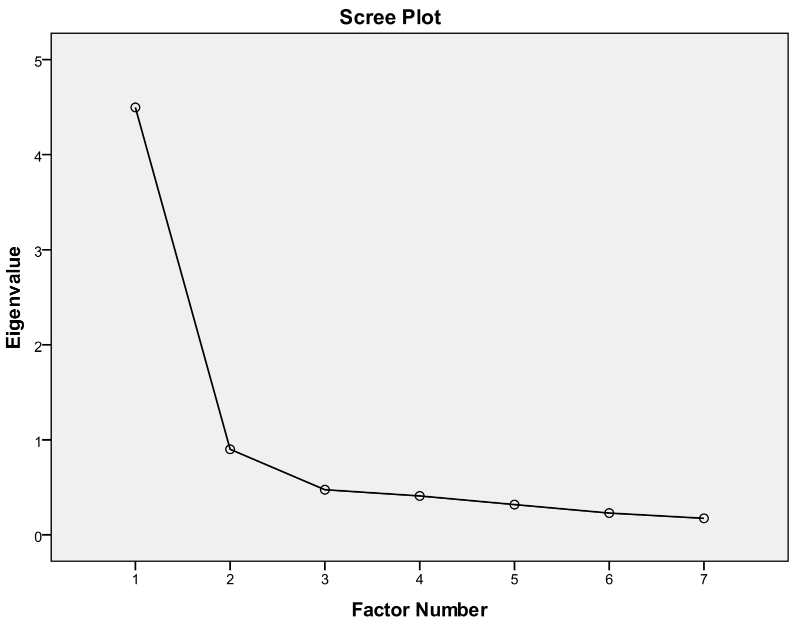


Figure 68 Scree Plot

Examination of the scree plot (refer Figure 68) would indicate a two factor solution is appropriate and parsimonious.

Table 46 Rotated Factor Matrix

Rotated Factor Matrix

	Factor	
	1	2
TSHEL4	**.922**	.214
TSHEL3	**.700**	.496
TSHEL5	**.697**	.346
TSHEL7	**.610**	.435
TSHEL1	.235	**.787**
TSHEL2	.438	**.755**
TSHEL6	.303	**.696**

The factor matrix (refer Table 46) gives the factor loadings for each item on the underlying construct. The two factor structure is clear (bold). Factor 1 would seem to best map expectations by staff while factor 2 would seem to map a wider context of school and parents.

Confirmatory factor analysis 2

Single factor congeneric measurement models were separately constructed for each factor and tested for fit. To set the scale of the latent variable the variance of the construct was set to one rather than the usual practice of setting a factor loading to 1. This was done to allow a significance level to be generated for every factor loading. If a factor loading is set to one a significance level is not generated for that factor.

Factor 1

A single factor congeneric model of Factor 1 (TSHEL3, TSHEL4, TSHEL5, TSHEL7) was specified as a latent variable with 4 reflective indicators. The model with standardised parameters is illustrated.

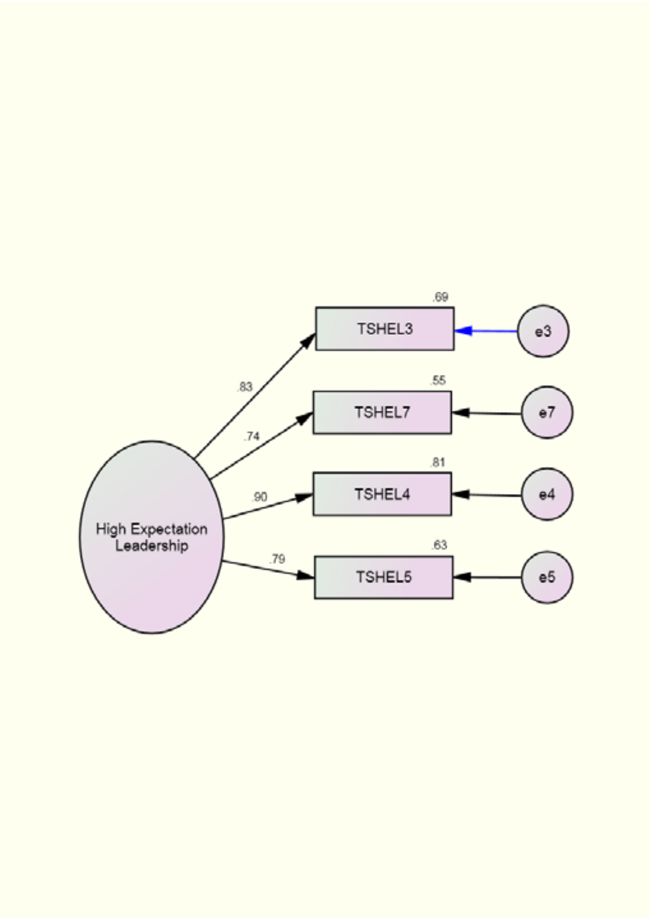


Figure 69 Measurement Model High Expectation Leadership

The model (refer Figure 69) converged and was a good fit. The standardised factor coefficients ranged from a low of .743 to a high of .901 – which is a good result. The error variances ranged from 1.77 to 2.9 which is also good. Variance accounted for by the factor across indicators ranged from .552 to .811 – also good.

In summary - a one factor congeneric model of the latent construct High Expectations Leadership factor 1 was respecified as a latent variable with 4 reflective indicators. The data fit the model well χ^2 (2)= 4.177, p= .124, RMSEA = .064 (.000, .153), GFI = .992, TLI = .989 and CFI = .996.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case neither the tau model (χ^2 (5) = 17.133, p = .004) nor the parallel model (χ^2 (8) = 31.379, p = .000) fitted the data well so the congeneric model is retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). The SMCs for the indicator variables mapped by Factor 1 were TSHEL3 (.691), TSHEL4(.811), TSHEL5 (.625) and TSHEL7 (.552). All items are above the "good" cut-off. In summary Factor 1 is explaining between 55% and 81% of the variance across the individual indicator variables.

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the Factor 1 was .67. In other words Factor 1 is accounting in total for 67% of the variation in the indicator variables which is above the recommended cut off of 50%.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for Factor 1 is .89; well above the recommended cut off.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Factor 1 model was .905 which represents a high reliability (Hancock & Mueller) and is in line with previous measures calculated.

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The Factor 1 model fitted well as confirmed by the non significant χ^2 supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were TSHEL3 (15.975), TSHEL4 (18.044), TSHEL5 (14.843) and TSHEL7 (13.587) all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommended that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for all items mapped by Factor 1 were above .7 reinforcing the claim for convergent validity.

Index score
A scale score for Factor 1 (refer Table 47) that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing.

Table 47 Regression Weights Factor 1

	TSHEL3	TEHEL4	TSHEL5	TSHEL7
Raw regression weights Factor 1	.108	.174	.079	.062
Proportional regression weights factor 1	.255	.411	.187	.147

The scale score then becomes:

Factor 1 (refer Table 47) score = (*TSHEL3*.255*) + (TSHEL4*.411) + (TSHEL5*.187) + (TSHEL7*.147)

This approach ensures the estimates of the scale score adjusted for measurement error is proportionally weighted by the actual contribution made by each indicator. The proportional regression weight scores sum to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same 'metric' as that of indicators for the construct.

A review of the items mapping factor 1 would indicate the construct would be better named ***Promoting High Expectation Leadership***.

Factor 2

A single factor congeneric model of Factor 2 (TSHEL1, TSHEL2, TSHEL6) was specified as a latent variable with 3 reflective indicators. This model (refer Figure 69) is just identified therefore model fit statistics will not be able to be generated. The model with standardised parameters is illustrated.

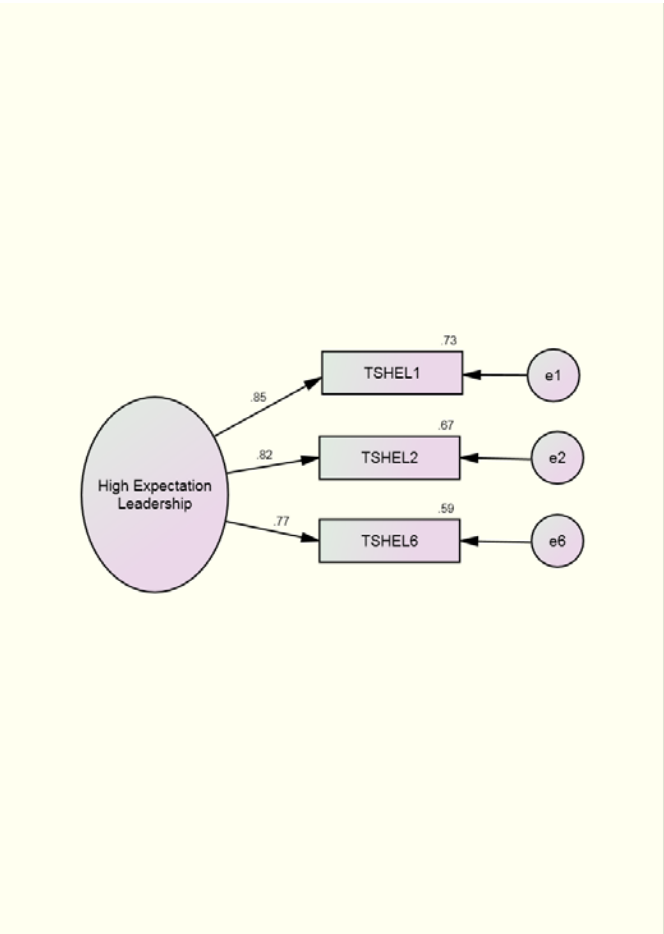


Figure 70 Measurement Model High Expectation Leadership

While fit statistics cannot be calculated the standardised regression weights ranged from 0.77 to .86 ($p<0.05$) which is good. The squared multiple correlations ranged from .59 to .73 which is adequate. The error variances range from 1.1 to 1.7 which is very good. Cronbach alpha was 0.852 which is very good given the scale is mapped by only 3 items.

In summary while fit statistics could not be calculated the other parameters listed all suggest the items map the construct well.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). The SMCs for the indicator variables mapped by Factor 2 were TSHEL1 (.731), TSHEL2(.666) and TSHEL6 (.586). All items are above the "good" cut-off. In summary Factor 2 is explaining between 59% and 73% of the variance across the individual indicator variables.

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the Factor 2 was .66. In other words Factor 2 is accounting in total for 66% of the variation in the indicator variables which is above the recommended cut off of 50%.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for Factor 2 is .86; well above the recommended cut off.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Factor 2 model was .860 which represents a high reliability (Hancock & Mueller) and is in line with previous measures calculated.

Convergent validity is a measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were TSHEL1 (15.693), TSHEL2 (14.798), and TSHEL6 (13.676) all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommended that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for all items mapped by Factor 2 were above .7 reinforcing the claim for convergent validity.

Index score

A scale score for Factor 2 (refer Table 48) that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing.

Table 48 **Regression Weights - Factor 2**

	TSHEL1	TSHEL2	TSHEL6
Raw regression weights Factor 2	.220	.152	.128
Proportional regression weights Factor 2	.440	.304	.256

The scale score then becomes:

Factor 2 (refer Table 48) score = (*TSHEL1*.440)* + *(*TSHEL2*.304*)* + (*TSHEL6*.256*)*

This approach ensures the estimates of the scale score adjusted for measurement error is proportionally weighted by the actual contribution made by each indicator. The proportional regression weight scores sum to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same 'metric' as that of indicators for the construct.

A review of the items mapping factor 2 would indicate the construct would be better named *High Expectation Leadership Enactment*.

Appendix 3.1.4 Indigenous Leadership Measurement model

Table 49 Teachers Survey Indigenous Leadership Measurement Model
The Items

Item name	Description
TSIL1	Indigenous and non-Indigenous staff plan curriculum together.
TSIL2	Indigenous community members are involved in curriculum planning.
TSIL3	Indigenous community members are professional development leaders for school staff.
TSIL4	Indigenous staff hold formally recognised leadership positions in the school (e.g., deputy principal, head of department, head of curriculum, etc.).
TSIL5	Indigenous staff hold informal leadership positions in the school (e.g., sports coordinator, before/ after school coordinator, responsible for Indigenous student initiat...
TSIL6	Indigenous staff hold committee positions in the school.
TSIL7	Indigenous community members hold committee positions on governance boards (e.g., councils and leadership groups).
TSIL8	Indigenous community members involved with the school mentor staff.
TSIL9	Indigenous students hold formally recognised leadership positions in the school (e.g., class captain, house captain or prefect).

Descriptives:

Table 50 Descriptives

	TSIL1	TSIL2	TSIL3	TSIL4	TSIL5	TSIL6	TSIL7	TSIL8	TSIL9
N	173	168	174	169	170	161	151	166	169
Minimum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maximum	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Mean	4.98	3.51	3.63	2.79	3.97	4.29	3.81	3.92	5.95
Std. Error	.218	.194	.201	.198	.209	.231	.237	.220	.216
Std. Deviation	2.86	2.51	2.66	2.58	2.73	2.94	2.91	2.83	2.80
Skewness	-.084	.574	.594	1.212	.480	.303	.579	.479	-.548
Std. Error	.185	.187	.184	.187	.186	.191	.197	.188	.187
Kurtosis	-1.38	-.929	-1.03	.007	-1.12	-1.39	-1.15	-1.23	-1.12
Std. Error	.367	.373	.366	.371	.370	.380	.392	.375	.371

The minimum and maximum values for each variable lie in the scale range of 1-9 (refer Tables above) respectively indicating the absence of outliers that could arise from data entry problems. The mean scale (refer Table 50) scores on each variable ranged from 2.79 to 5.95 on a 9 point scale however most items have a mean around 4 with standard deviations around 2.5 suggesting adequate variance of response.

Missing value analysis indicated that 133 out of a total of 180 cases were complete with respect to the item list – this includes "don't know" responses.

A new variable "totmiss" was calculated that contained a count of the number of missing response (missing plus "don't know") per case across the response set. Those cases that had a missing count of 4 or more (out of 9) were deleted. This left 167 cases of the original 180.

Table 51 **Variable Summary**

Variable Summary

	Missing N	Missing Percent	Valid N	Mean	Std. Deviation
TSIL7	18	10.8%	149	3.8054	2.92861
TSIL6	8	4.8%	159	4.2390	2.91104
TSIL8	7	4.2%	160	3.8375	2.81033
TSIL2	7	4.2%	160	3.5187	2.49773
TSIL9	5	3.0%	162	5.9012	2.82669
TSIL1	5	3.0%	162	4.9444	2.89409
TSIL5	2	1.2%	165	3.8788	2.69776
TSIL3	2	1.2%	165	3.6364	2.67803
TSIL4	1	.6%	166	2.7410	2.52726

The resultant percent missing for most variables is small with TSIL7 (refer Table 51) having the greatest percent missing around 10%. While Cohen and Cohen (1983) suggest that missing data up to 10% is not problematic as the majority of missing values represent the 'don't know' response a decision was made to use maximum likelihood estimation (expectation-maximization EM) to impute likely values for those missing.

Both exploratory and confirmatory factor analysis are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should be normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms and P-P plots (refer Figures below) would indicate some important departures from normality with all variables. This has implications for the estimation techniques used in the confirmatory factor analysis in particular.

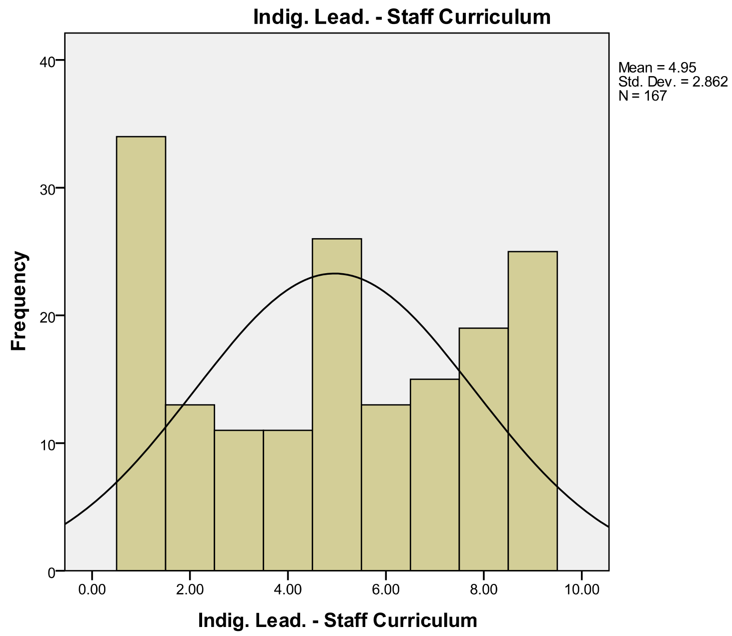


Figure 71 Histogram - Indigenous Leader – Staff Curriculum

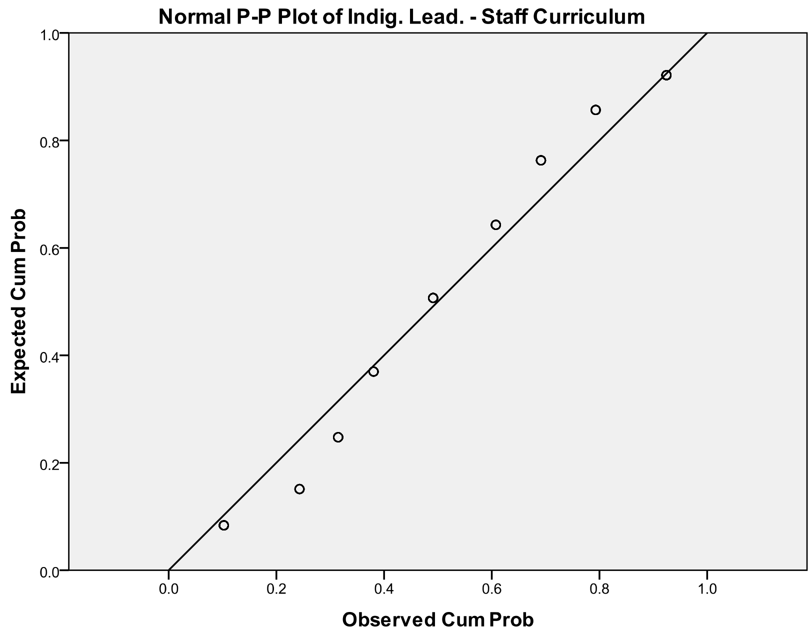


Figure 72 P-P Plot - Indigenous Leader – Staff Curriculum

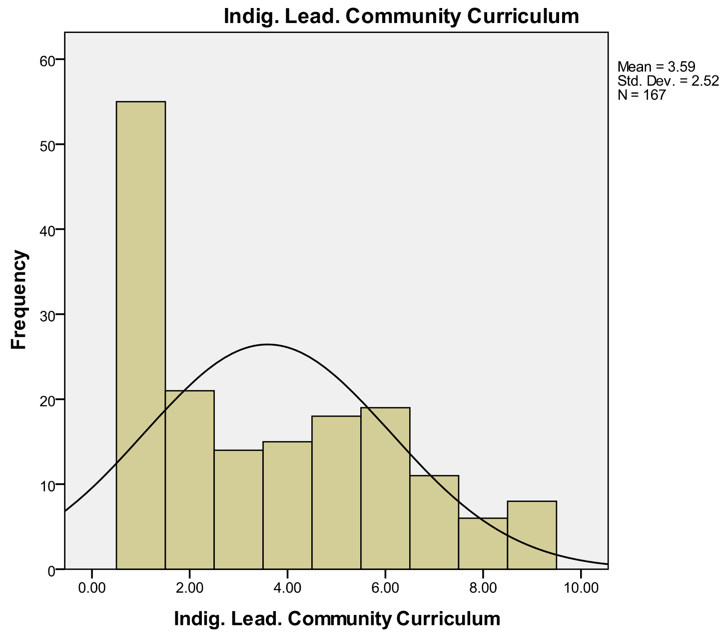


Figure 73 Histogram - Indigenous Community Curriculum

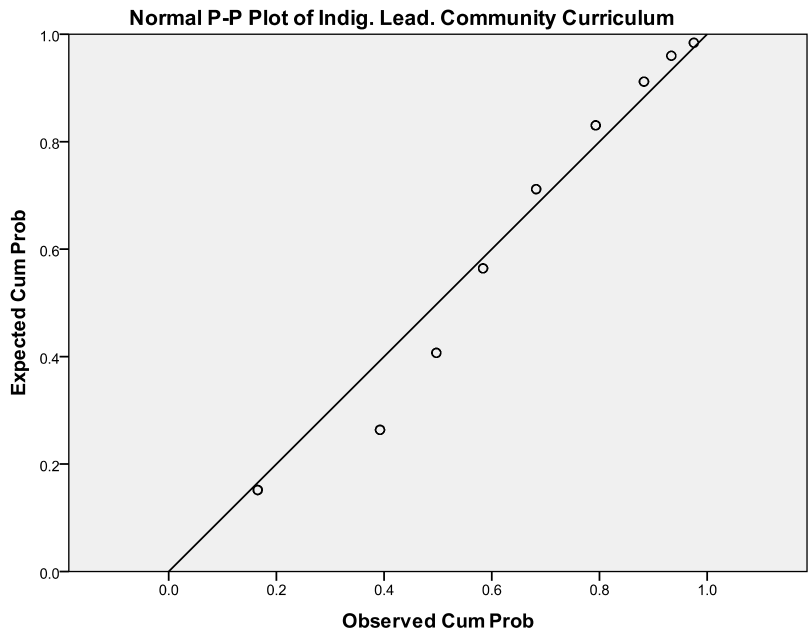


Figure 74 P-P Plot - Indigenous Leader Community Curriculum

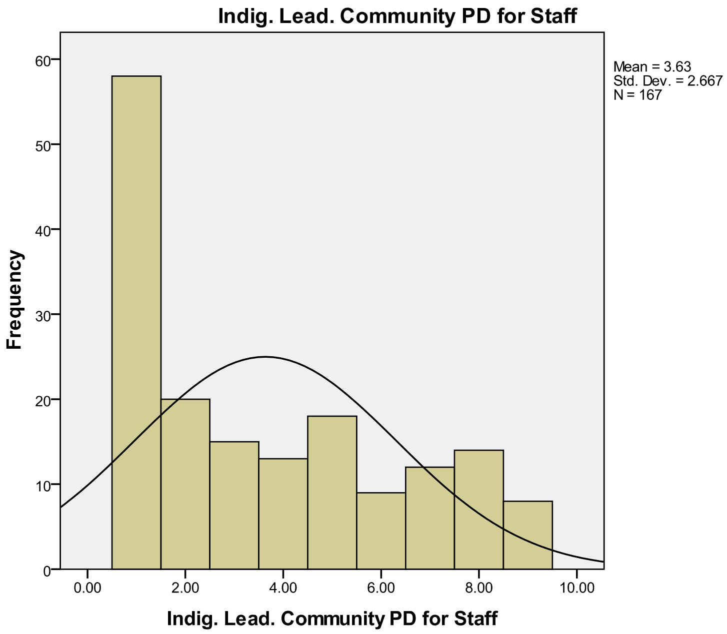


Figure 75 Histogram - Indigenous Leader Community PD for Staff

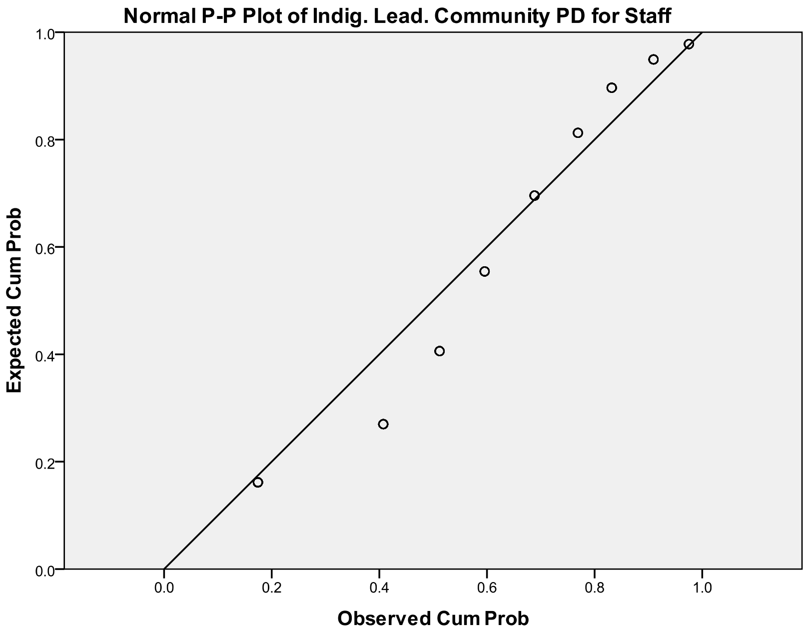


Figure 76 P-P Plot - Indigenous Leader Community PD for Staff

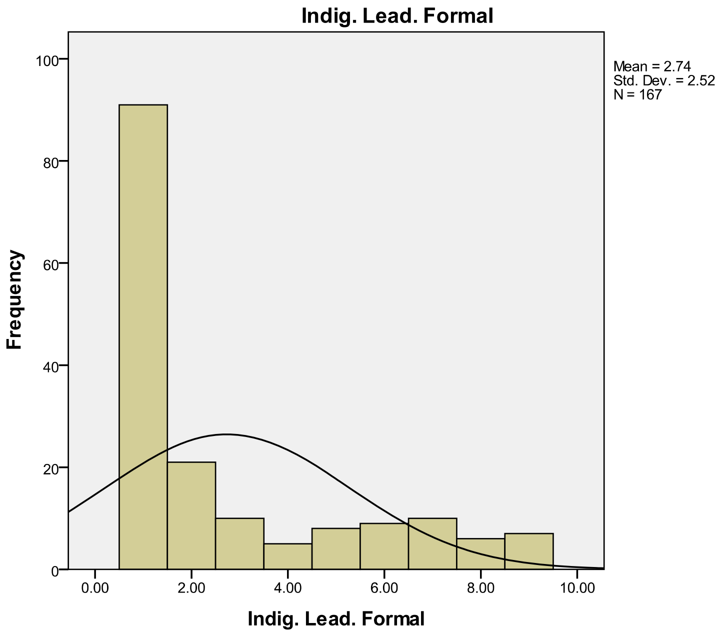


Figure 77 Histogram - Indigenous Leader Formal

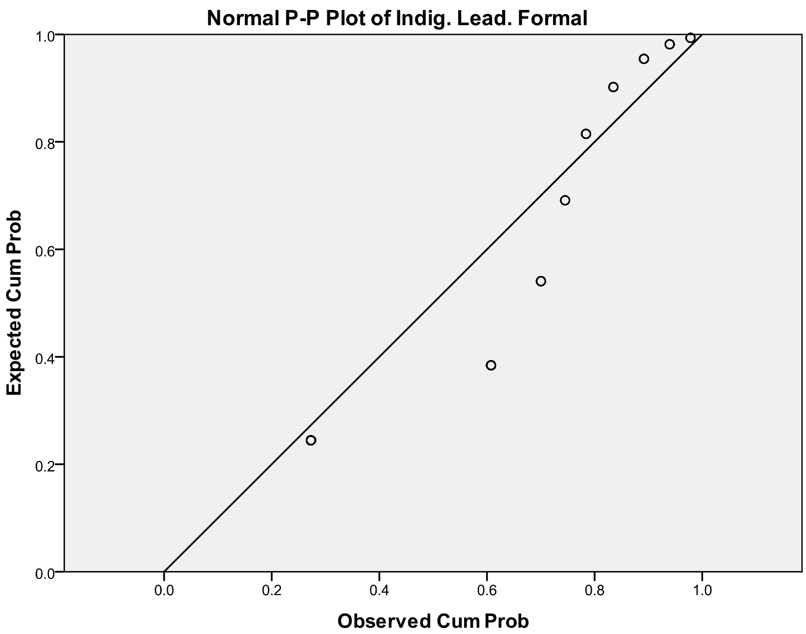


Figure 78 P-P Plot - Indigenous Leader Formal

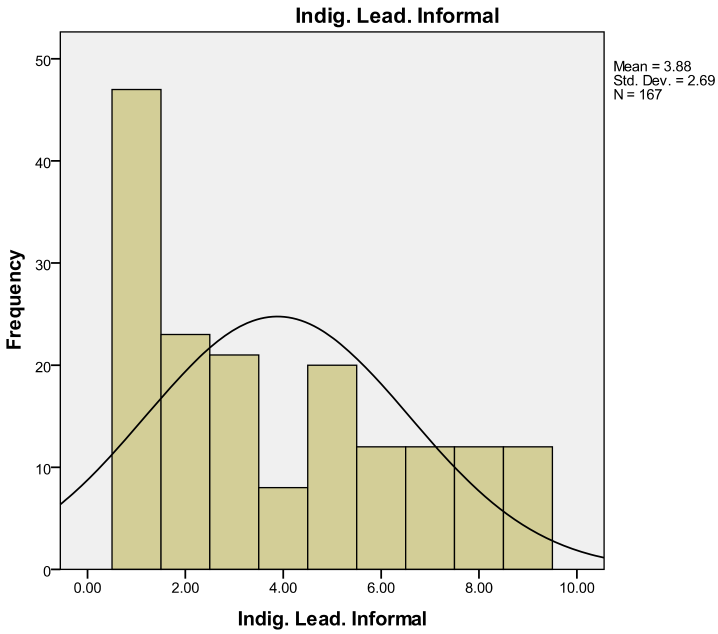


Figure 79 Histogram - Indigenous Leader Informal

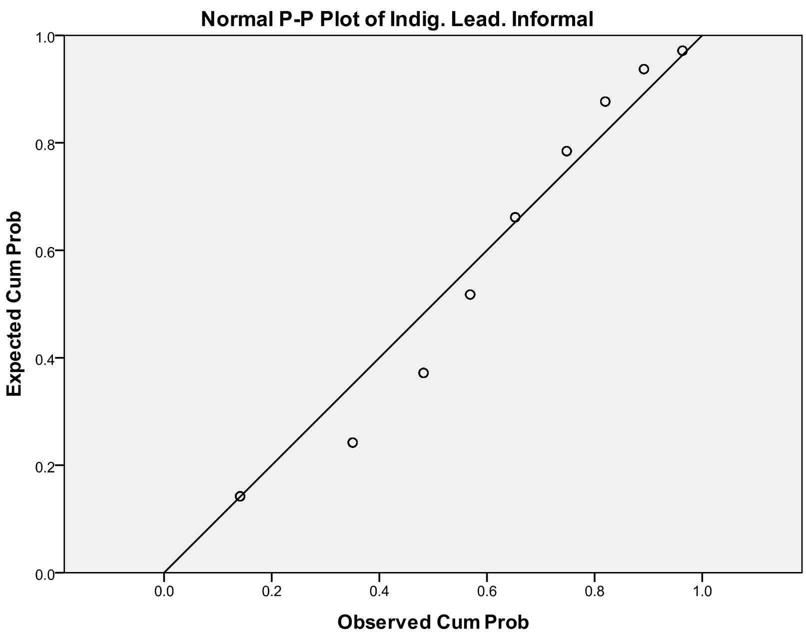


Figure 80 P-P Plot - Indigenous Leader Informal

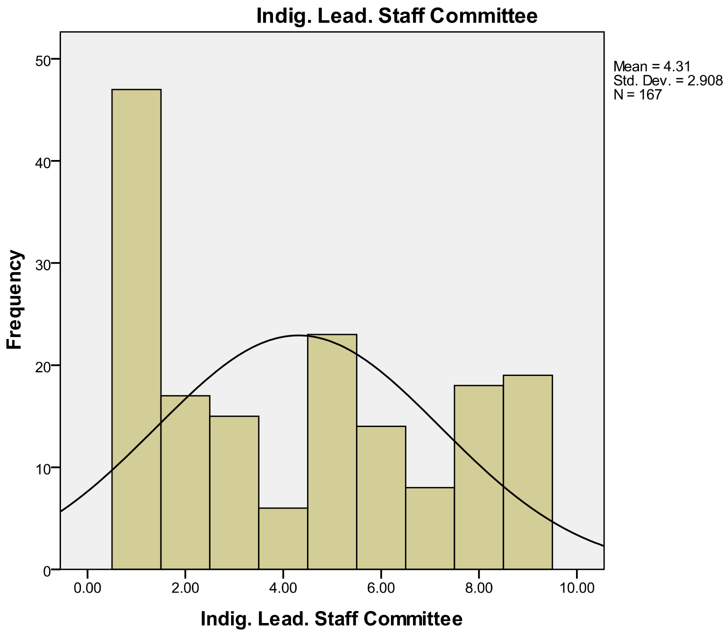


Figure 81 Histogram - Indigenous Leader Staff Committee

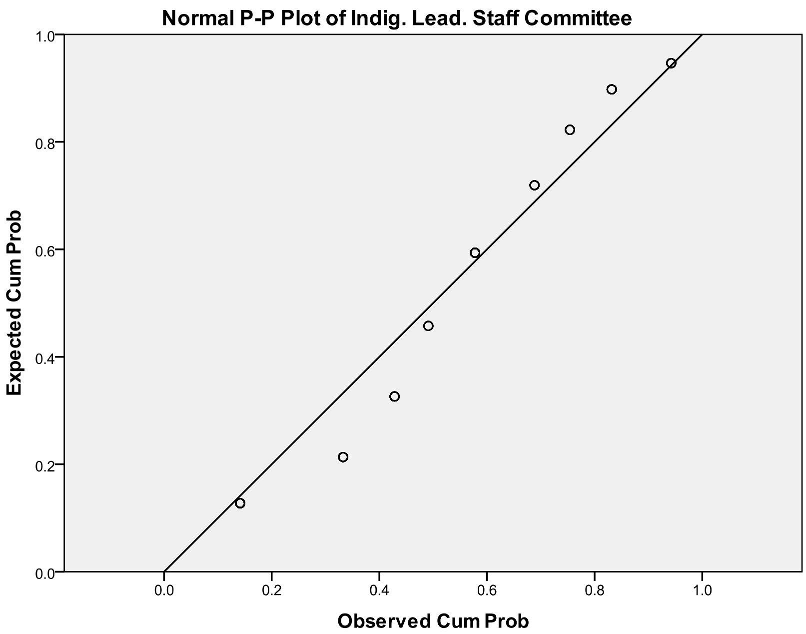


Figure 82 P-P Plot - Indigenous Leader Staff Committee

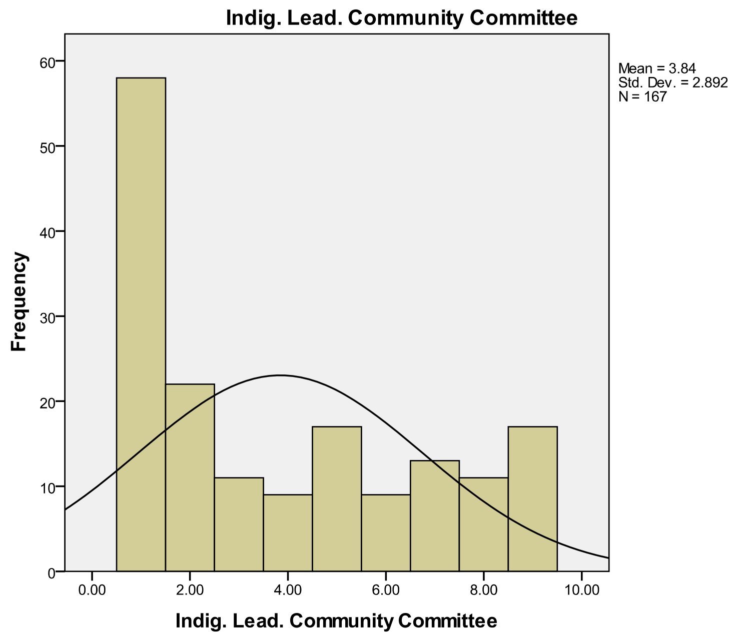


Figure 83 Histogram - Indigenous Leader Community Committee

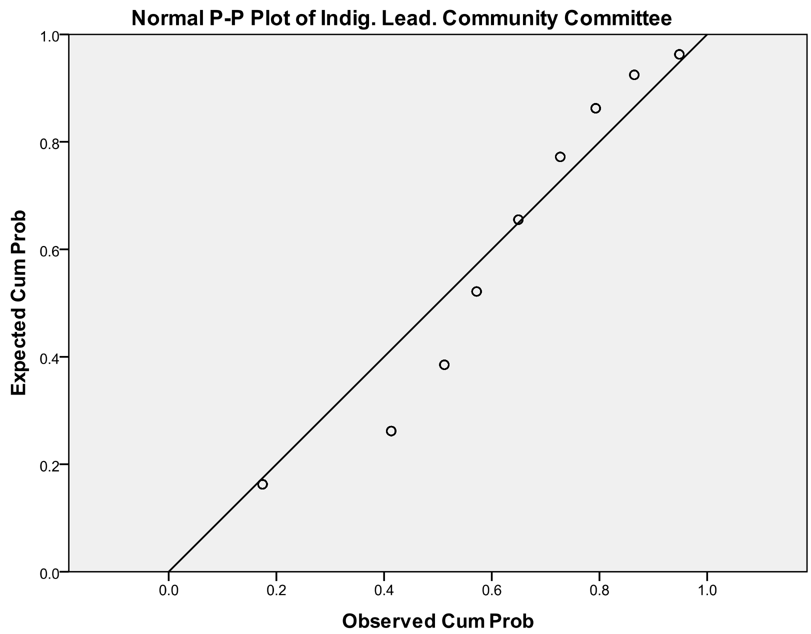


Figure 84 P-P Plot - Indigenous Leader Community Committee

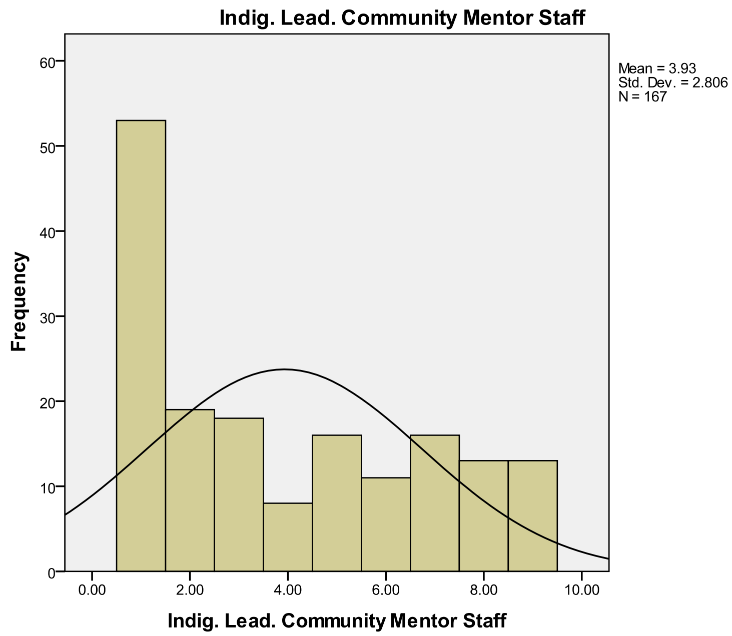


Figure 85 Histogram - Indigenous Leader Community Mentor Staff

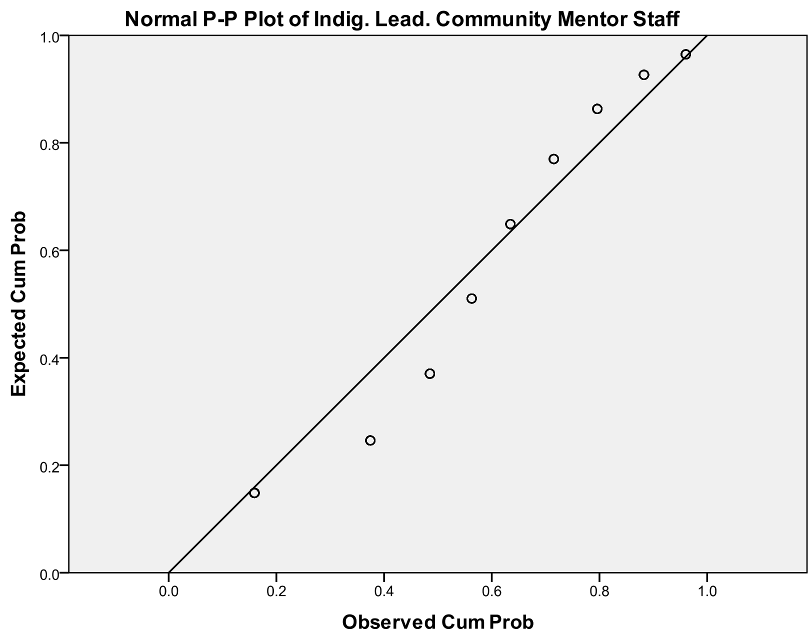


Figure 86 P-P Plot - Indigenous Leader Community Mentor Staff

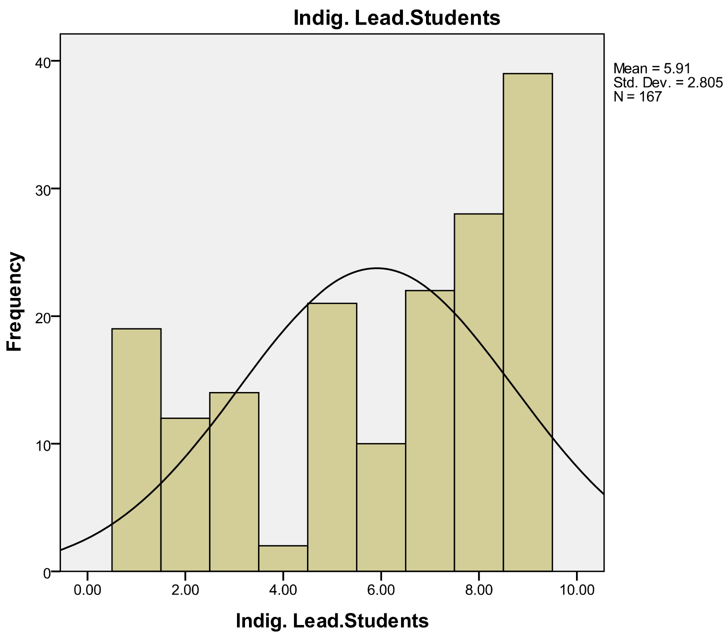


Figure 87 Histogram - Indigenous Leader Students

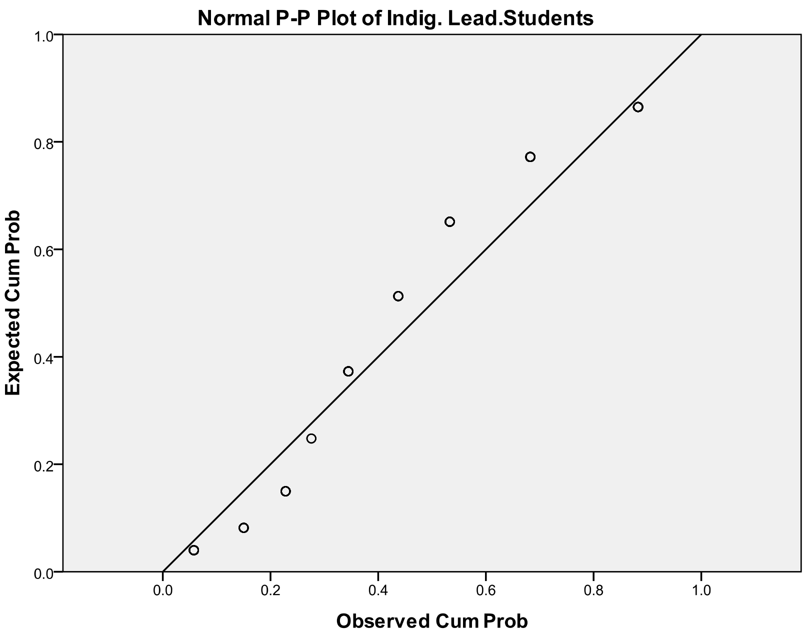


Figure 88 P-P Plot - Indigenous Leader Students

The measurement model

Given the sample used in this analysis is drawn from a constrained population (teachers) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis

As indicated previously much of the data follows a non normal distribution but as the factor analysis is being used in a descriptive way to summarise relationships, assumptions in regards to normal data may be relaxed as long as the deviation is not too large (Tabachnick & Fidell, 2007).

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 51).

Table 52 Correlation Matrix

Correlation Matrix

		TSIL1	TSIL2	TSIL3	TSIL4	TSIL5	TSIL6	TSIL7	TSIL8	TSIL9
Correlation	TSIL1	1.000	.613	.449	.352	.405	.569	.487	.411	.384
	TSIL2	.613	1.000	.672	.452	.449	.568	.624	.549	.351
	TSIL3	.449	.672	1.000	.457	.514	.518	.501	.622	.320
	TSIL4	.352	.452	.457	1.000	.635	.530	.478	.416	.286
	TSIL5	.405	.449	.514	.635	1.000	.602	.503	.454	.345
	TSIL6	.569	.568	.518	.530	.602	1.000	.795	.600	.462
	TSIL7	.487	.624	.501	.478	.503	.795	1.000	.643	.448
	TSIL8	.411	.549	.622	.416	.454	.600	.643	1.000	.552
	TSIL9	.384	.351	.320	.286	.345	.462	.448	.552	1.000

The correlation matrix (refer Table 52) shows the majority of the correlations are greater than 0.4 and most variables have a medium correlation with at least 2 or 3 other variables and all are significant. This would suggest there may be some basis for applying an EFA.

Table 53 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.860
Bartlett's Test of Sphericity	Approx. Chi-Square	833.020
	df	36
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is **833.02** with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.860 would suggest there is probably a factor structure underlying the variables (refer Table 53).

Table 54 Communalities

Communalities

	Initial	Extraction
TSIL1	.466	.411
TSIL2	.631	.558
TSIL3	.582	.485
TSIL4	.456	.385
TSIL5	.527	.451
TSIL6	.722	.729
TSIL7	.706	.701
TSIL8	.600	.556
TSIL9	.356	.297

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 54) would indicate a reasonable level of variation (small < 0.3) in the items (except for item TSIL9) is being explained by the latent factor. Specifically between 30% and 73% of the variance in items is being explained by the underlying factor structure. Of concern is the extraction in many cases is explaining less variance in an item than the initial model i.e. a model which uses a linear combination of all other items as a predictor of the item in question. Also of concern is that only 2 of the items have communalities >.7 and the average of the communalities is below .6. This could be indicative of poorly fitting items or the presence of more than one factor.

The analysis was re run using a 2 factor solution. The situation did not improve so it was decided to retain only those items that have communalities above .5. The analysis was rerun using TSIL2, TSIL6, TSIL7 and TSIL8.

Table 55 Total Variance Explained

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.897	72.414	72.414	2.553	63.827	63.827
2	.470	11.752	84.166			
3	.435	10.864	95.031			
4	.199	4.969	100.000			

As expected one factor was extracted accounting for ~ 72% of the total variance of 4 (4 because we have 4 variables and the variance for each variable has been standardised to 1).

The variance explained (refer Table 55) by the factor solution is now in most cases more than that explained by the initial solution - a definite improvement.

Table 56 Factor Matrix

Factor Matrix

	Factor
	1
TSIL7	.920
TSIL6	.858
TSIL8	.709
TSIL2	.684

The factor matrix (refer Table 56) gives the factor loadings for each item on the underlying constructs. The loadings are all above or close to the recommended cut-off of .7.

Table 57 Goodness-of-fit Test

Goodness-of-fit Test

Chi-Square	df	Sig.
3.317	2	.190

The Chi-square goodness of fit test (refer Table 57) indicates the items map to the underlying factor well.

Confirmatory factor analysis

A confirmatory factor analysis was performed to further validate the proposed model.

Table 58 Teacher Survey Indigenous Leadership

The Indigenous Leadership factor was mapped by the following items in the CFA.

TSIL2	Indigenous community members are involved in curriculum planning.
TSIL6	Indigenous staff hold committee positions in the school.
TSIL7	Indigenous community members hold committee positions on governance boards (e.g., councils and leadership groups).
TSIL8	Indigenous community members involved with the school mentor staff.

Table 59 Sample Correlations (Group Number 1)

Sample Correlations (Group number 1)

	TSIL2	TSIL7	TSIL6	TSIL8
TSIL2	1.000			
TSIL7	.624	1.000		
TSIL6	.568	.795	1.000	
TSIL8	.549	.643	.600	1.000

The sample correlations (refer Table 59) ranged from a low of 0.549 to a high of 0.795 suggesting item redundancy is not a problem. The eigenvalues would suggest a one factor solution.

A single factor congeneric model of Indigenous Leadership was specified as a latent variable with 4 reflective indicators. The model with standardised parameters is illustrated below (refer Table 59).

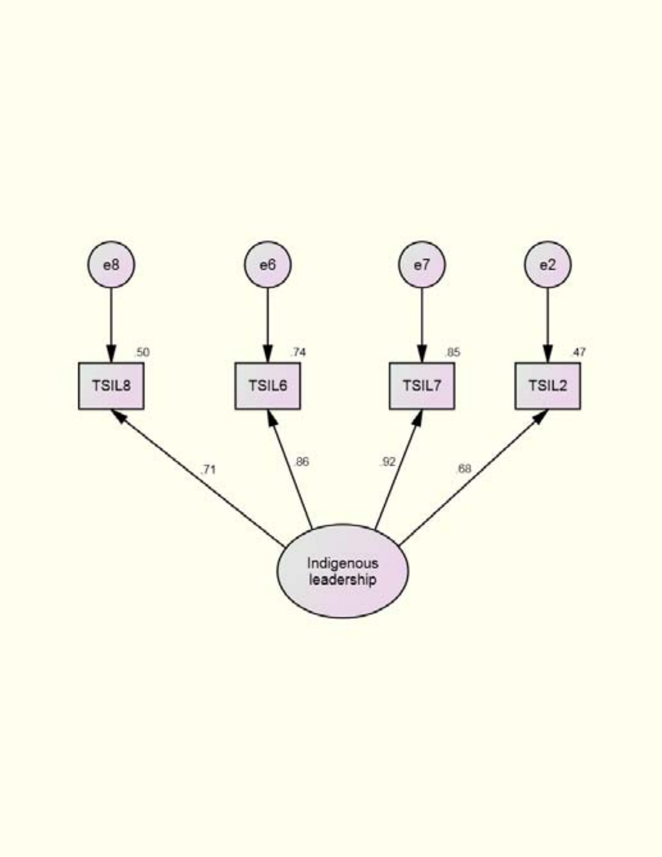


Figure 89 Measurement Model Indigenous Leadership

The model (refer Figure 89) converged and was a good fit. The factor coefficients ranged from a low of .68 to a high of .92.

In summary - a one factor congeneric model of the latent construct Indigenous Leadership was specified as a latent variable with 4 reflective indicators. The data fit the model well $\chi^2(2)$ =3.374, p = .185, RMSEA = .064 (.000, .180), GFI = .990, TLI = .988 and CFI = .996.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case the parallel model ($\chi^2(8)$ =39.057, p = .000) and the tau model ($\chi^2(5)$ =31.386, p = .000) did not fit the data well so the congeneric model was retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). The SMCs for the indicator variables mapped by the Indigenous Leadership factor were TSIL8 (.50), TSIL6 (.74), TSIL7 (.92) and TSIL2 (.47) - all are above or close to the “good” cut-off .

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the Indigenous Leadership factor was .56. In other words the factor is accounting in total for 56% of the variation in the indicator variables which is above the recommended cut off of 50%.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for Indigenous Leadership factor is .87; well above the recommended cut off.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Indigenous Leadership factor model was .91 which represents a high reliability (Hancock & Mueller) .

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The Indigenous Leadership factor model fitted well as confirmed by the non significant Chi-square test of model fit thus supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were TSIL2 (9.673), TSIL7 (14.732), TSIL6 (13.245) and TSIL8 (10.142)(refer Table 60) - all of which are significant at the .05 level which support a claim for convergent validity.

Index Score

A scale score for the Indigenous Leadership construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing.

Table 60 Regression Weights

	TSIL2	TSIL7	TSIL6	TSIL8
Raw regression weights	.046	.185	.100	.045
Proportional regression weights	.122	.492	.266	.120

The scale score then becomes:

Indigenous Leadership score = (TSIL2*.122) +(TSIL7*.492) + (TSIL6*.266) + (TSIL8*.120)

This approach ensures the estimates of the scale score adjusted for measurement error is proportionally weighted by the actual contribution made by each indicator. The proportional regression weight (refer Table 60) scores sum to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same 'metric' as that of indicators for the construct.

Appendix 3.1.5 Indigenous Cultural Knowledge Measurement Model

Table 61 Teachers Survey – The Items

The Items

Item name	Description
TSICK2a	I have read, watched, or listened to local or national Indigenous media (e.g., radio, television, newspapers, magazines, websites).
TSICK2b	I have read research on supporting Indigenous student learning (e.g., journal articles, conference papers, policy reports).
TSICK2c	I have participated in professional development activities focused on supporting Indigenous student learning.
TSICK2d	I am familiar with the Indigenous histories of the community where I teach.
TSICK2e	I am familiar with the Indigenous geographies and place names of the community where I teach.
TSICK2f	My pre-service teacher education program prepared me to support Indigenous student learning.

Descriptives:

Table 62 Statistics

Statistics

		TSICK2a	TSICK2b	TSICK2c	TSICK2d	TSICK2e	TSICK2f
N	Valid	180	180	180	180	180	180
	Missing	0	0	0	0	0	0
Mean		4.07	4.77	5.07	4.86	4.61	2.26
Std. Deviation		2.514	2.419	2.688	2.385	2.520	2.128
Skewness		.449	.076	-.070	-.084	.129	1.910
Std. Error of Skewness		.181	.181	.181	.181	.181	.181
Kurtosis		-.920	-1.144	-1.293	-1.068	-1.235	2.625
Std. Error of Kurtosis		.360	.360	.360	.360	.360	.360
Minimum		1	1	1	1	1	1
Maximum		9	9	9	9	9	9

The minimum and maximum values for each variable lie in the scale range of 1-9 (refer Table 62) respectively, indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 2.26 to 5.07 on a 9 point scale with standard deviations ranging between 2.13 and 2.69 however most items have a mean around 4 with standard deviations around 2.5 suggesting adequate variance of response. The exception is item TSICK2f where the responses are positively skewed – not surprising given the substance of the item.

The measurement models (refer Table 62) constructed to plumb the constructs of School Indigenous Ethos, High Expectations Leadership, Community Engagement and Indigenous Leadership were clearly reflective in nature and as such lent themselves to exploratory factor analysis (EFA) followed by confirmatory factor analysis (CFA) to establish the measurement models. The construct Indigenous Cultural Knowledge is more of a formative model (Edwards & Bagozzi, 2000). In a formative model the causal action flows from the items to the construct rather than from the construct to the items as in a reflective model. To help alleviate some of the issues associated with possible model misspecification the EFA was replaced with a Principal Components Analyse (PCA). Principal component analysis makes no assumption about an underlying causal model. Principal component analysis is a variable reduction procedure that attempts to define a relatively small number of components that account for most of the variance in a set of observed variables. The congeneric CFA measurement model was replaced with Rasch modelling (Rasch, 1960). The Rasch approach has the added advantage of producing a scale score that is of interval level of measurement and non sample specific. Further interval level of measurement on the item scale does not have to be assumed nor need the distribution be normal.

Principal Components analysis does have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991). The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation. when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) As this instrument employs a 9 point scale PCA analysis was conducted assuming interval level of measurement

While PCA makes no distributional assumptions on items in the set it does require that the items responses exhibit variance across the sample. A visual analysis of the histograms (refer Figures below) would indicate that variance is present across the response sets.

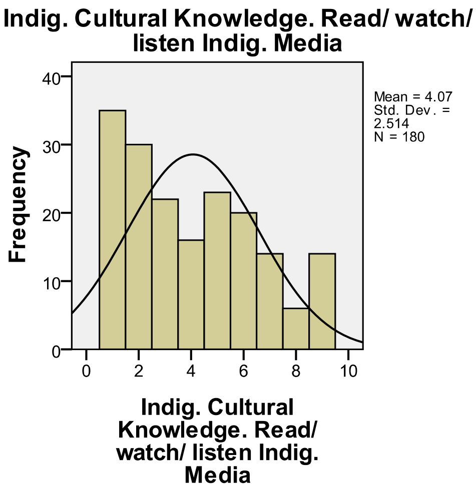


Figure 90 **Histogram - Indigenous Cultural Knowledge – Indigenous Media**

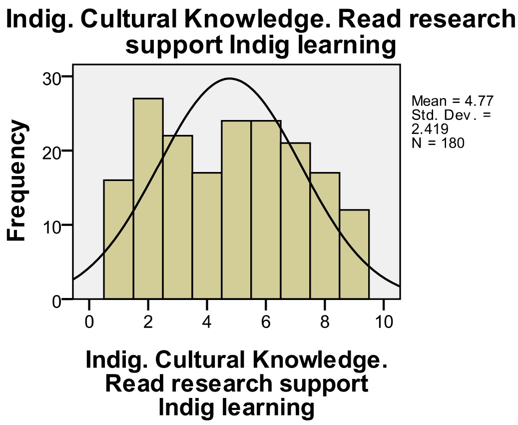


Figure 91 **Histogram - Indigenous Cultural Knowledge – Indigenous Learning**

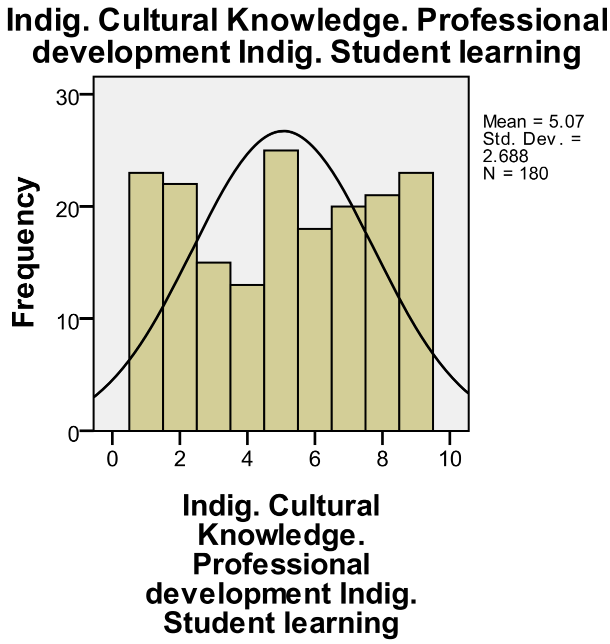


Figure 92 Histogram - Indigenous Cultural Knowledge – Indigenous Student Learning

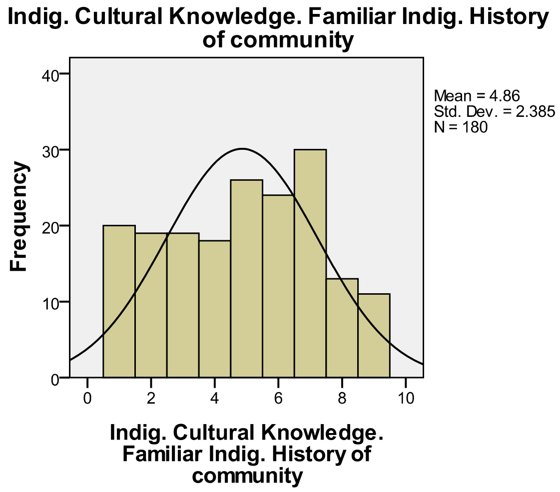


Figure 93 Histogram - Indigenous Cultural Knowledge – History of Community

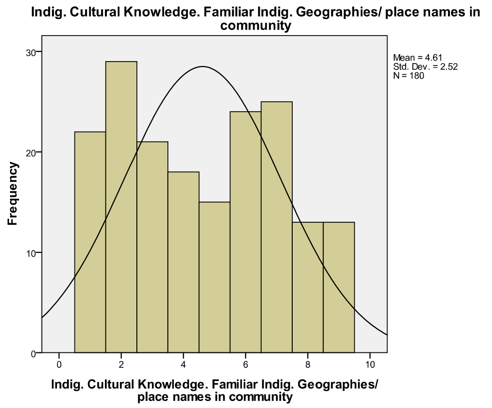


Figure 94 Histogram - Indigenous Cultural Knowledge – Familiar Indigenous Geographies /Place Names in Community

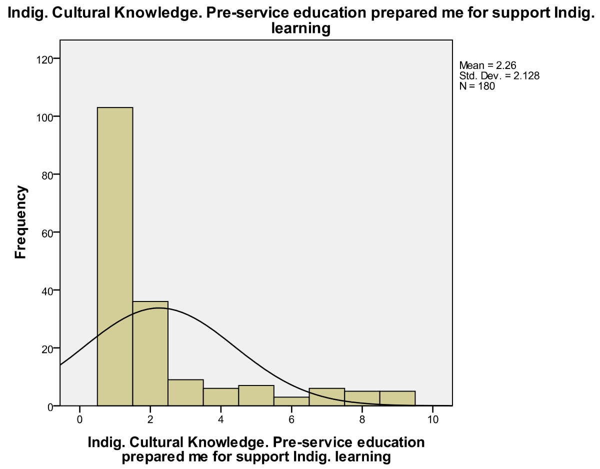


Figure 95 Histogram - Indigenous Cultural Knowledge – Pre-Service Education prepared me for Support Indigenous Learning

The measurement model

In stage one a principal components analysis (PCA) was conducted to determine which linear combination of variables best accounted for variance across the items and hence identify possible underlying components. In the second stage, a Rasch approach is used to validate the model and compute interval measurement scale scores.

Principal Components Analysis

The first step in the PCA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 63).

Table 63 Correlation Matrix

Correlation Matrix

	TSICK2a	TSICK2b	TSICK2c	TSICK2d	TSICK2e	TSICK2f
TSICK2a	1.000					
TSICK2b	.511	1.000				
TSICK2c	.271	.516	1.000			
TSICK2d	.448	.514	.523	1.000		
TSICK2e	.424	.527	.502	.803	1.000	
TSICK2f	.219	.171	.143	.240	.213	1.000

The correlation matrix (refer Table 63) shows the majority of the correlations are greater than 0.4 and most variables have a medium to large correlation with at least 2 or 3 other variables and all are significant (though this is not surprising given the large sample size). The exception is item TSICK2f. A decision was made to retain the item in the first instance as these items can sometimes act as anchor points for the Rasch scale. The level of relationship among the items would suggest conducting a PCA is feasible.

Table 64 KNO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.780
Bartlett's Test of Sphericity	Approx. Chi-Square	404.752
	df	15
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 404.752 with a significance level of 0.000. This suggests there are moderate correlations among the variables. The adequate Kaiser-Meyer-Olkin measure of 0.780 would suggest there is probably a component structure underlying the variables (refer Table 64).

Table 65 Communalities

Communalities

	Initial	Extraction
TSICK2a	1.000	.439
TSICK2b	1.000	.603
TSICK2c	1.000	.500
TSICK2d	1.000	.740
TSICK2e	1.000	.722
TSICK2f	1.000	.129

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 65) would indicate a reasonable level of variation (small < 0.3) in the items is being explained by the component space except for item TSICK2f. This is not surprising given the low correlations TSICK2f had with most other items. Excluding TSICK2f specifically between 44% and 74% of the variance in items is being explained by the underlying component space.

Table 66 Total Variance Explained

Total Variance Explained

Component		Initial Eigenvalues			Extraction Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
dimension0	1	3.132	52.203	52.203	3.132	52.203	52.203
	2	.930	15.505	67.708			
	3	.740	12.332	80.039			
	4	.610	10.164	90.204			
	5	.394	6.559	96.763			
	6	.194	3.237	100.000			

The above table (refer Table 66) shows that only one of the eigenvalues exceeds one – as a result 1 component will be extracted. Component 1 is accounting for ~ 52% of the total variance.

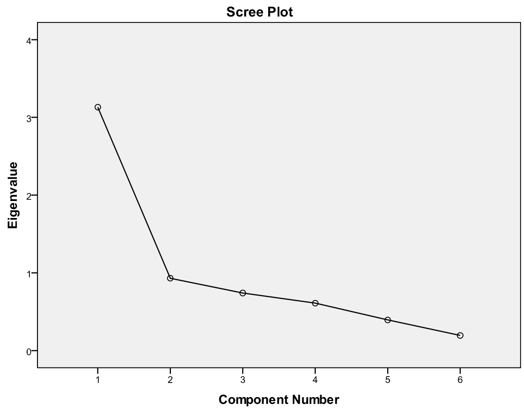


Figure 96 Scree Plot

Examination of the scree plot (refer Figure 96) would also support a one component solution.

The Rasch modelling to be subsequently used in this analysis is essentially a uni dimensional approach therefore it is important to be very sure how many components are extracted and which items map to which component. To further plumb the number of components present in the component space a Monto Carlo parallel analysis (Horn, 1965) was also conducted to determine the number of components extracted. This analysis compares the size of the eigenvalues obtained with those obtained from a randomly generated data set of the same size. Only those eigenvalues that exceed the corresponding values from the random set are retained.

Table 67 Monte Carlo PCA for Parallel Analysis

Monte Carlo PCA for Parallel Analysis

Number of variables: 6
Number of subjects: 180
Number of replications: 200

++

Eigenvalue #	Random Eigenvalue	Standard Dev
1	1.2561	.0620
2	1.1329	.0421
3	1.0348	.0369
4	0.9489	.0362
5	0.8641	.0393
6	0.7632	.0512

++

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An examination of the output of the simulation and comparing with the eigenvalues obtained from the PCA (refer Table 67) reinforces the decision that a single component should be extracted.

In summary six items purported to map Indigenous Cultural Knowledge were subjected to Principal Components Analysis (PCA). Prior to performing the PCA the suitability of the data was assessed through examination of the descriptives (sufficient variance indicated), correlation matrix (most coefficients >0.3) , Kaiser-Meyer-Oklin value (0.78) and Bartlett's Test of Sphericity (p=0.001) ; all supporting a possible component solution.

PCA revealed the presence of one component with an eigenvalue exceeding 1. Examination of the scree plot and the results of the Parallel Analysis supported this claim.

On this basis it was decided to enter all items into a partial credit Rasch model.

The Rasch Measurement Model

A Rasch model produces an interval scale with items arranged on the scale (Rasch ruler) according to the probability (item difficulty) a particular level of the item will be endorsed. The process produces model, item and person fit measures which supplement conceptual assessment of item coherence and/or suitability.

The following steps were employed in assessing the Cultural Knowledge Rasch measurement scale:

- Evaluation of overall model fit – χ^2 Item-Trait Interaction statistic (Bonferroni adjusted alpha), reliability measures (Cronbach –alpha, Person Separation Index –PSI)
- An assessment of the suitability of the response format and check for disordered thresholds (Category Probability Curves, Threshold Map)
- Evaluation of fit of individual items – Fit Residual Value , χ^2 probability value
- Evaluate person fit - Fit Residual Value , χ^2 probability value
- Check for local dependency amongst items – Residual Correlations
- Assess the dimensionality of the scale – Residual Principal Components
- Evaluate the targeting of the scale for the sample – Item Map , Person Item Distribution

The test for differential item functioning was not conducted as no person factors were entered in the model.

Table 68 Teachers Survey - Items

Items

Item name	Description
TSICK2a	I have read, watched, or listened to local or national Indigenous media (e.g., radio, television, newspapers, magazines, websites).
TSICK2b	I have read research on supporting Indigenous student learning (e.g., journal articles, conference papers, policy reports).
TSICK2c	I have participated in professional development activities focused on supporting Indigenous student learning.
TSICK2d	I am familiar with the Indigenous histories of the community where I teach.
TSICK2e	I am familiar with the Indigenous geographies and place names of the community where I teach.
TSICK2f	My pre-service teacher education program prepared me to support Indigenous student learning.

Initial overall model fit

Rasch analysis of the 6 item Indigenous Cultural Knowledge scale (refer Table 68) showed lack of fit to the Rasch model with a significant Item-Trait Interaction χ^2 (12) = 50.18, p=0.001. The item and person fit statistics are transformed to approximate a z-score representing a standardized normal distribution therefore if persons and items fit the model we would expect to see a fit residual mean of 0 with a standard deviation of 1. A high standard deviation (>1.5) for either items or persons is indicative of misfit. The fit residual mean for items is -0.066 with a standard deviation of 1.44. This would tend to suggest there is not a large deviation to the expected probabilistic relationships between individual items and the rest of the items on the scale. The fit residual mean for person is -0.247 with a standard deviation of 0.914. This would tend to indicate no serious misfit among the respondents of the sample further the small negative mean would indicate the scale was reasonably well targeted for use with this group. These are only top level checks and individual item and person fit data will be examined subsequently.

Thresholds

In Rasch terms an item threshold refers to a point between two response categories where either response is equally probable. A form of item misfit can occur where respondents inconsistently use response categories across the levels of the trait being measured. This is termed a disordered or reversed threshold.

Disordered thresholds cab be detected through examination of a threshold map (refer Figure 97).

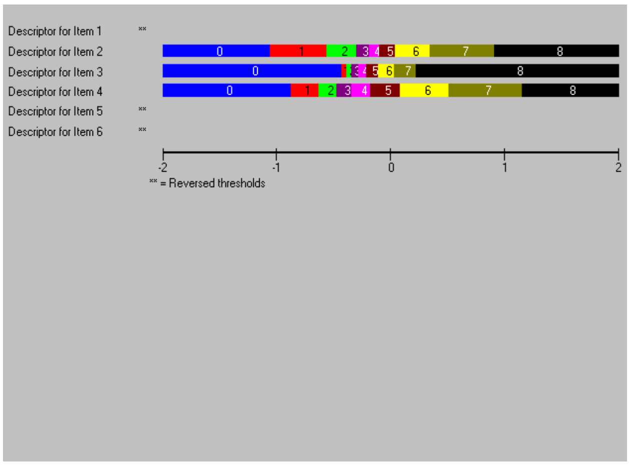

Figure 97 Threshold Map

An examination of the threshold map (refer Figure 97) would indicate problematic reverse thresholds for items TSICK2a, TSICK2e and TSICK2f.

The next step is to examine the Category Probability Curves (refer Figures below) for the problematic items to determine which response option is causing the problem. For a well fitting item you would expect that across the whole range of the trait each response option would systematically take turns at having the highest probability of endorsement. This is the case item TSICK2d (refer Figure 98).

Category Probably Curve Item TSICK2d

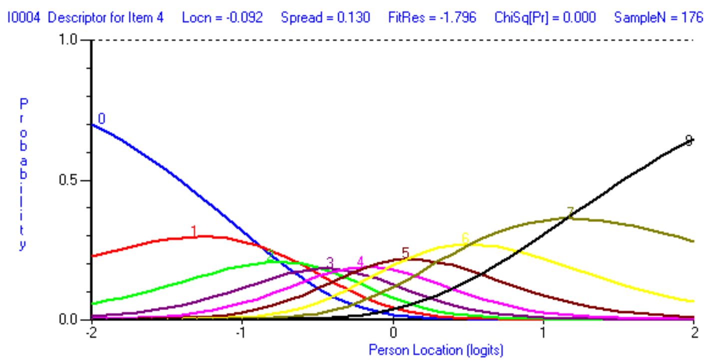

Figure 98 Category Probably Curve Item TSICKd

The category probability curve (refer Figure 99) for the mis-fitting item TSICK2a.

Category Probably Curve Item TSICK2a

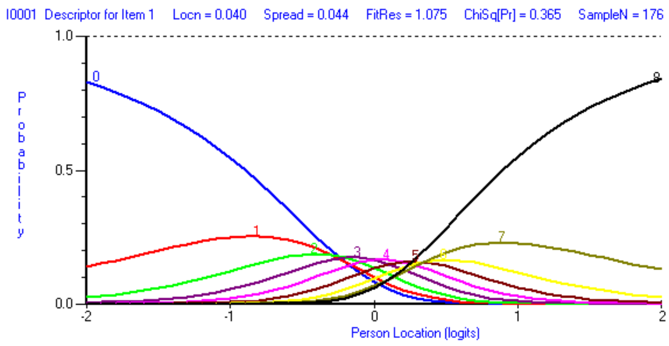

Figure 99 Category Probably Curve Item TSICKa

It is clear the second (coded 1), third (coded 2), fifth (coded 4) and sixth (coded 5) response categories do not have a range along the Indigenous Cultural Knowledge scale where they are the most likely category to be selected. An attempt was made to re-score the item with only marginal success as respondents used the middle response band inconsistently. An analysis of the wording of the item indicated the stem perhaps was not specific enough in relation to the type of media. It is possible the item would be improved by splitting the emphasis between the different types of media. A decision was made to drop the item from the scale. The Item-Trait Interaction Chi Square improved by approximately 4 point to χ^2 (10) = 46.303, p=0.001. The overall model fit is still not satisfactory given the significant p value.

The category probability curve for the mis-fitting item TSICK2f (refer Figure 100)

Category Probably Curve Item TSICK2f

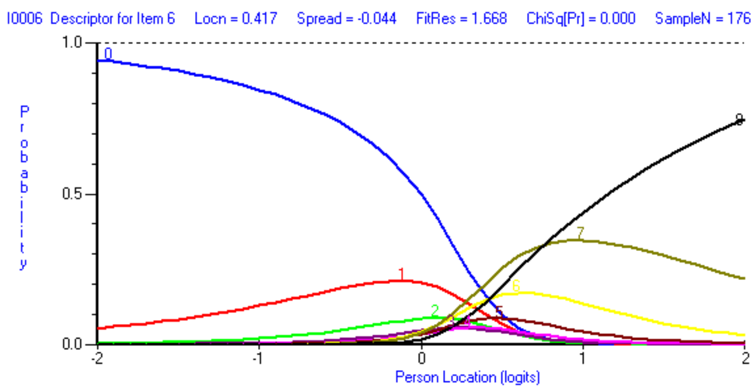

Figure 100 Category Probably Curve Item TSICK2f

An analysis of the category probability curve for item TSICK2f (refer Figure 100) would indicate extensive disordered thresholds with the middle response categories with participants choosing the middle response categories in a way that is inconsistent with the probability of their responses on other items. This is not surprising given the low correlations TSICK2f had with other items in the scale and the very low communality displayed in the PCA. An analysis of the stem of the item would suggest the item is mapping a trait not directly related to Cultural Indigenous Knowledge but rather career preparation. Given these substantiative reasons the item was removed from the scale. The Item-Trait Interaction Chi Square improved by approximately 32 point to χ^2 (8) = 13.841, p=0.086. The model now fits indicated by the non-significant p value. Further item TSICK2e no longer exhibits disordered thresholds.

Person fit

It is possible as part of the Rasch modelling process to identify persons who response patterns are unusual in some way perhaps for example a "lazy" response where someone selects the same response category for each item on the scale or their responses are idiosyncratic and do not fit the probabilistic pattern of other respondents. These problems can be detected at the model fit level by examination of the Fit Residual SD where a value >1.5 would indicate a problem. The value of the Fit Residual SD in this case is 1.16 indicating no severe problems. This was also substantiated by examination of the Individual Person Fit statistics. A residual value less than -2.5 is considered indicative of a purer Guttman response (Guttman, 1950) pattern than expected by the probabilistic Rasch model and is not regarded as problematic. A residual value greater than +2.5 is considered to be indicative of an unexpected response pattern under the Rasch model (Tennant & Conaghan, 2009). No Individual Person Fit Residual SDs were above 2.5.

The Fitted Model

The four items TSICK2b, TSICK2c, TSICK2d, TSICK2e were found to fit the Indigenous Cultural Knowledge scale well. Overall model fit parameters are displayed (refer Table 69).

Table 69 – Model fit statistics

Overall model fit	Item Fit Residual Mean (SD)	Person Fit Residual Mean (SD)	Person Separation Index	Cronbach Alpha
χ^2 (8) = 13.84 p = 0.086	0.129(1.33)	-0.452(1.16)	0.79 (with extremes) 0.76 (no extremes)	0.83(with extremes) 0.81(no extremes)

The chi-square probability is greater than the Bonferroni adjusted value of 0.013 indicating good overall fit. The item and person fit (refer Table 69) means and standard deviations are close to 0 and 1 respectively. This suggests no mis-fitting items and the scale is well targeted to the sample. The Person Separation Index is a measure of internal consistency of the scale and the power of the measure to discriminate amongst respondents across different levels of the trait. The obtained value of 0.79 is close to the 0.8 cut off for being considered acceptable(Tennant & Conaghan, 2009). Cronbach Alpha is also a measure of internal consistency of the item set with the 0.83 value being considered good for a four item set.

Individual item fit

Table 70 **Individual item fit statistics**

Item	Location Value	SE	Fit Residual	χ^2	Prob
TSICK2b	0.000	0.047	1.213	0.060	0.971
TSICK2c	-0.109	0.043	1.353	2.344	0.340
TSICK2d	0.033	0.048	-1.001	4.987	0.826
TSICK2e	0.077	0.046	-1.048	6.452	0.040

Item (refer Table 70) locations allow the ordering of the items in terms of difficulty i.e. ordering the items in order of likelihood of selection of high response categories. All items are very similar in this regard with item TSICK2c (professional development) being the “most difficult” to respond with a high category and TSICK2e (Indigenous geographies and place names) the “least difficult”. The Fit Residuals (<1.5), χ^2 and probability values (>.013 - Bonferroni adjusted) all indicate good individual item fit.

Inspection of the Item Characteristic curves (refer Figure 101) indicated items had good discriminatory power. Item TSICK2c slightly under estimates scores for the lowest group on the trait. This is indicated by one point being slightly off the curve.

Item Characteristic curve TSICK2c

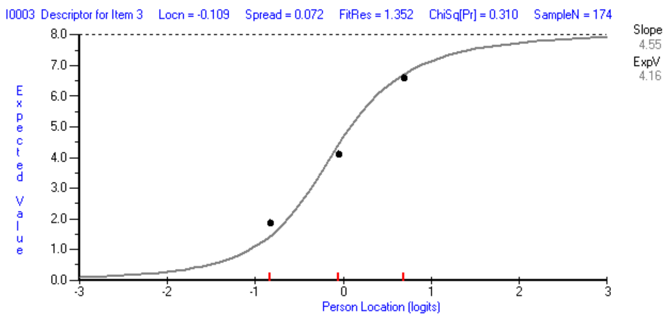

Figure 101 Item Characteristic Curve TSICK2c

Targeting

It is important that the measures used are appropriately targeted at the population being assessed. The Person-Item threshold distribution (refer Figure 102) shows no floor or ceiling effects and item thresholds are generally spread along the continuum of traits. There are a few people at the extremes not covered but these are most probably outliers with unusual scores. This conclusion is also supported by inspection of the Person Item Map (refer Figure 102) that gives information about the relative difficulty of the items against the distribution of respondents. There is a good spread of items and thresholds across the range of respondent scores with no gaps or clustering at the high or low ends.

Person Item Threshold Distribution

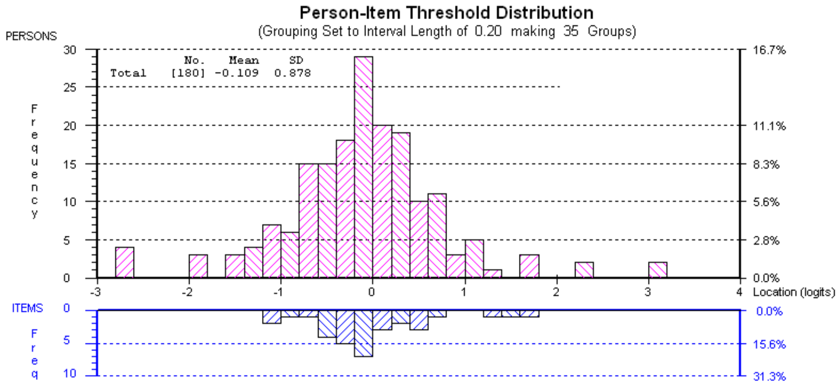

Figure 102 Person Item Threshold Distribution

Person Item map

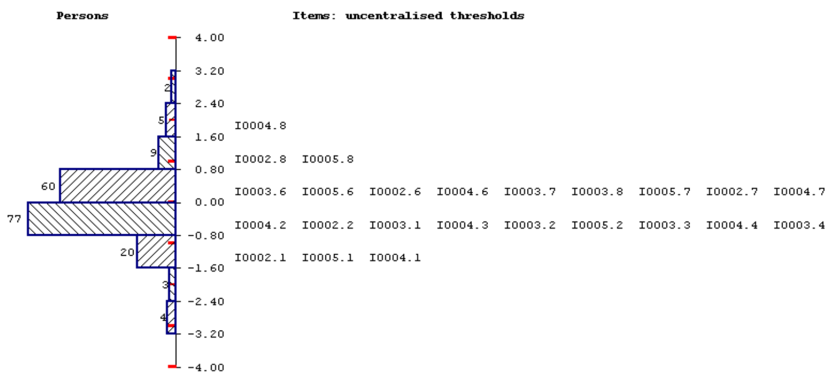

Figure 103 Person Item Map

Uni-dimensionality

It is imperative that the scale is measuring a single construct. To plumb this PCA analysis of the residuals was performed. The aim of this is to identify patterns of the residuals once the 'Rasch factor' has been extracted. This is important in order to identify any subsets of items that may be loading together, and therefore may represent a different construct. To test this the two most different groups (residuals loading positively and residuals loading negatively) were determined from the PCA loadings. These two sets (refer Figures above) represent the most different estimates of person location. Independent sample T-tests are then performed on these two groups. For the items to be assumed to be measuring the same scale it is a requirement that no more than 5% of the t-tests result in a p-value <0.05 (Smith, 2002).Independent t-tests showed the Indigenous Cultural Knowledge scale to be uni-dimensional (function 1.3% , 95%CI 2.2%, 4.9%).

Response dependency

Response dependency occurs when the response on one item is dependent on the response of another item. Response dependency was assessed by examining the residual correlations between items taking note of any positive correlations noticeably higher than other correlations as being indicative of dependency(Andrich, Sheridan, & Luo, 2003) . There were no positive residual correlations noticeably larger than the other correlations in the scale with correlations in the range -0.25 to -0.52. Hence there was no evidence of response dependency in any of the items.

Summary
Rasch analysis of the 6 item Indigenous Cultural Knowledge scale showed lack of fit to the Rasch model with a significant Item-Trait Interaction χ^2 (12) = 50.18, p=0.001. The fit residual mean and standard deviation for items (-0.066, 1.44) and persons (-0.247, 0.914) indicated no serious misfit of either items or persons. An examination of the threshold map would indicate problematic reverse thresholds for items TSICK2a, TSICK2e and TSICK2f. After examination of the substantiative nature of the questions and based on analysis of the Category Probability Curves items TSICK2a and TSICK2f were removed from the model. This modification corrected the disordered thresholds associated with item TSICK2e.

A new Rasch model was fitted incorporating the remaining four items TSICK2b, TSICK2c, TSICK2d, and TSICK2e. The data and items fitted the model well (χ^2 (8) = 13.84, p = 0.086) with adequate measures of internal consistency; Person Separation Index (0.79) and Cronbach alpha (0.83). The scale was uni-dimensional and displayed good targeting as well as good individual item and person fit. No response dependency was detected.

Given the model was a good fit location scores were generated for each person. These scores are of interval level of measurement and are therefore suitable for subsequent parametric analysis.

School Leader Survey

Section 1: Demographics

1.1.Date: ______________________________

1.2.Surname: ______________________________

1.3.Given name: ______________________________

1.4.Age: ______________________________

1.5.Gender: Female ☐ Male ☐

1.6.Are you of Aboriginal or Torres Strait Islander Origin? Yes ☐ No ☐

Section 1a: Education and Work Experience

1.1a. Please list your degrees and credentials.

____

1.2a. How many years have you worked in a school or other educational institution? ______________________

1.3a. How many different schools have you worked in since the beginning of 2006?

____

1.4a. What school do you now work in?

____

1.5a. What is your current role? __________________________

1.6a. How many years have you worked in your current role? __________________________

1.7a. How many years have you worked at this school? __________________________

1.8a. Have you worked in schools with an Indigenous student population of more than 25%? Yes ☐ No ☐

Section 1b: SSLP/ SSLC Involvement

1.1b. Have you completed the Stronger Smarter Leadership Program? Yes ☐ No ☐

1.2b. What year did you complete the Stronger Smarter Leadership Program (SSLP)?

____

1.3b. Is your school a Stronger Smarter Learning Community (SSLC) Hub school? Yes ☐ No ☐

1.4b. Is your school a Stronger Smarter Learning Community (SSLC) Affiliate school? Yes ☐ No ☐

Section 1c: School Priorities

1.1c. Given your current school situation and the limitations of resources and staff, where would you allocate resources over the next 12 months? Please **rank order only five** of the following from 1= "top priority" to 5= "lowest priority":

PROFESSIONAL DEVELOPMENT (e.g., teacher professional learning, student / teacher relationships, teacher cultural and contextual understanding).	☐
STUDENT SUPPORT (e.g., behaviour management, retention, transitions, supportive school environment, goal setting and learning plans).	☐
CURRICULUM (e.g., relevance, a specific KLA intervention, engagement, choice and multiple pathways).	☐
SCHOOL CULTURE (e.g., emphasis on high expectations and student success).	☐
INDIGENOUS CULTURE (e.g., identity, cultural knowledge, cultural visibility).	☐
NETWORKS AND PARTNERSHIPS (e.g., links with other people, organisations, schools and	☐

communities).	
SCHOOL LEADERSHIP (e.g., support to develop leadership roles in the school such as assistant principal, senior teacher, curriculum head, Indigenous worker, project leaders).	☐
PARENT ENGAGEMENT (e.g., parents, guardians and caregivers).	☐
STUDENT OUTCOMES (e.g., attendance, NAPLAN, social outcomes, retention and post-school pathways).	☐
INDIGENOUS EDUCATION WORKERS (e.g., role, employment and career paths).	☐
Other	☐

1.2c. If other, please specify:

____

____

Section 2. Indigenous Identity

We are interested in your views on engagement with Indigenous identity and how they might have changed over time. We want to look at three periods: when you came to the school, currently and in 12 months.

Please indicate on the scale below to what degree (where 1= “not much” to 9= ”a lot”) the statements reflect the situation in your school at the time indicated.

	When you came to the school									Your current situation									In 12 months time in your school								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
2.1. The school curriculum is modified to embed Indigenous knowledges and ways of knowing.																											
2.2. Teachers adopt pedagogies that are sensitive to Indigenous students ways of knowing.																											
2.3. Teachers promote communication between Indigenous and non-Indigenous students.																											
2.4. Indigenous signs and symbols (e.g., art work, student murals etc.) are displayed in the classrooms and/or school.																											
2.5. The school as a community actively participates in Indigenous events.																											
2.6. Indigenous people participate in and/or advise on school events.																											
2.7. Indigenous students feel as though they belong in the school.																											

	When you came to the school									Your current situation									In 12 months time in your school								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
2.8. Indigenous language is used in the school yard.																											

2.9. Is there anything else you would like to say about Indigenous identity at your school?

____

____

____

Section 3. Indigenous Leadership

We are interested in your views of Indigenous leadership at your school.

Please indicate on the scale below to what degree (where 1 = "not much" to 9 = "a lot") the statements reflect the situation in your school at the time indicated.

	When you came to the school									Your current situation									In 12 months time in your school								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
3.1. Indigenous and non-Indigenous staff plan curriculum together.																											
3.2. Indigenous community members are involved in curriculum planning.																											
3.3. Indigenous community members are professional development leaders for school staff.																											

	When you came to the school									Your current situation									In 12 months time in your school								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
3.4. Indigenous staff hold formally recognised leadership positions in the school (e.g., deputy principal, head of department, head of curriculum, etc).																											
3.5. Indigenous staff hold informal leadership positions in the school (e.g., sports coordinator, before/ after school coordinator, responsible for Indigenous student initiatives, etc).																											
3.6. Indigenous staff hold committee positions in the school.																											
3.7. Indigenous community members hold committee positions on governance boards (e.g., councils and leadership groups).																											
3.8. Indigenous community members involved with the school mentor staff.																											
3.9. Indigenous students hold formally recognised leadership positions in the school (e.g., school captain, house captain, class captain or prefect).																											

3.10. Is there anything else you would like to say about Indigenous leadership at your school?

Section 4a. High Expectations Leadership

We are interested in your views of high expectations leadership in your school.

Please indicate on the scale below to what degree (where 1= "not much" to 9= "a lot") the statements reflect the situation in your school at the time indicated.

	When you came to the school									**Your current situation**									**In 12 months time in your school**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
4.1a. High expectations for Indigenous student learning are promoted in staff meetings.																											
4.2a. High expectations for Indigenous student learning are promoted in school policies.																											
4.3a. Staff are mentored in the importance of high expectations for Indigenous students.																											
4.4a. The staff of this school takes **collective** responsibility for unlocking the potential in Indigenous students.																											
4.5a. Indigenous students are challenged on achieving their potential.																											
4.6a. Parents of Indigenous students are consulted about high expectations for their children.																											
4.7a. High expectations for Indigenous student learning are embedded in classroom context.																											

4.8a. Is there anything else you would like to say about high expectations leadership at your school?

Section 4b. Expectations for Student Outcomes

We are interested in your expectations for Indigenous students in your school.

4.1b. Given the constraints and resources in your school, please **rank order** the following and rate them from 1= “top priority” to 4= “lowest priority”:

Attendance	☐
NAPLAN achievement scores	☐
Behaviour	☐
Continuing education	☐

4.2b. Do you have any comments about expectations for students at your school?

____

____

____

Section 5: Networks

It is of interest to the research team whether you talk to or consult with anybody in relation to improving Indigenous student educational outcomes. In response to the question below please write the role of the person(s), the name of the organisation where that person is located , what you talk about , and how often you have talked to this person (in the last month and last three months).

5.1. Who do you **talk to or consult with,** in relation to improving Indigenous student educational outcomes? If you do not communicate with others on this topic then leave blank.

Person number	Role of this person	Name of organisation	What do you talk about?	In the last month, how often have you talked to this person?	In the last 3 months, how often have you talked to this person?
2					
3					
4					
5					
6					
7					

5.2. Please comment on any other important relationships in the context of improving Indigenous student educational outcomes. ___________________________________

____

____

____

____

____

Section 6a. Innovative School Staffing

We are interested in your views of innovative school staffing at your school.

Please indicate on the scale below to what degree (where 1= "not much" to 9= "a lot") the statements reflect the situation in your school at the time indicated.

If there are systemic restrictions on your activities, please select "NA."

	When you came to the school									**Your current situation**									**In 12 months time in your school**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
6.1a. The school has the latitude to select teaching and professional staff. **NA** ☐																											
6.2a. Indigenous teachers are actively sought after by the school.																											
6.3a. Teachers with experience/ expertise in Indigenous education are actively sought after by the school.																											
6.4a. The school recruits Indigenous staff in professional support roles (e.g., teacher aide/ community education counsellor).																											
6.5a. The school recruits Indigenous staff in support roles (e.g., cleaner, groundskeeper, gardener, or bus driver).																											
6.6a. The school recruits administrative personnel in management positions with Indigenous experience or expertise (e.g., Heads of Department, Heads of Curriculum and Deputies).																											
6.7a. The specialist teachers have experience or																											

expertise with Indigenous students (e.g., speech pathologists, ESL, or special education).																											
	When you came to the school									Your current situation									In 12 months time in your school								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
6.8a. The school seeks advice from the Indigenous Community on staffing.																											
6.9a. The school has an induction process for teachers on Indigenous issues that incorporates community involvement.																											
6.10a. There is sufficient budgetary capacity to support flexible approaches to staffing.																											

6.11a. Does the school have a specific staff member in charge of Indigenous education? Yes ☐ No ☐

6.12a. If so, how was this person chosen?

___

6.13a. Please comment on any other strategies in your school that you would call an innovative staff model.

___

___

___

Section 6b. Innovative School Models

We are interested in your views of innovative school models.

Please indicate on the scale below to what degree (where 1= "not much" to 9= "a lot") the statements reflect the situation in your school at the time indicated.

	When you came to the school									Your current situation									In 12 months time in your school								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
6.1b. The school has before and/or after school support programs that take into account both the needs of the community and those of the Indigenous students (e.g., homework programs).																											
6.2b. Flexible timetabling allows the school to accommodate community and student needs (e.g., Indigenous community events, student mobility, family circumstances).																											
6.3b. The school has a dedicated space or centre for Indigenous students and/ or community members.																											
6.4b. The school has policies and procedures in place to monitor and respond to student mobility between schools.																											

6.5b. If you had the capacity at your school, what school model (e.g., multi campus; phase based approach: lower, middle and upper school; making campus available to other organisations: health, department of community services) would you prefer to adopt to support the improved educational outcomes for Indigenous students?

____

____

6.6b. Why would you adopt this model?

____

____

____

6.7b. Please comment on any other strategies in your school that you would call an innovative school model.

____

____

Section 7a: Stronger Smarter Learning Community Hub Schools

We are interested in your experiences of the Stronger Smarter Learning Community as a Hub school or Affiliate school. If you are an SSLC Hub school or Affiliate school please fill out this section. If not, please skip to section 8.

If you are a *HUB SCHOOL*, please answer section 7a (this section)

If you are an *AFFILIATE SCHOOL*, please answer section 7b (next section)

7.1a. **If you are a *HUB SCHOOL*,** please rank the following reasons for choosing your **Affiliate Schools/ Laterally Linked Hub Schools** from 1= "most important" to 7= "least important". If you are not laterally linked to any other Hub Schools, please leave the second column blank.

Only rank those reasons that had an impact on your decision. If your school is neither a Hub school nor an Affiliate school, please skip this section.

	Affiliate Schools	**Laterally Linked Hub Schools**
Affiliated with schools that are similar in profile to us (e.g., state defined like schools or like schools as identified by the 'Myschool' website).	☐	☐
Affiliated with schools on the basis of past professional relations with key staff.	☐	☐
Selected geographically close area/cluster schools as Affiliates/ Laterally Linked Hub Schools.	☐	☐
Affiliated with schools that share our philosophy.	☐	☐
Affiliated with schools as part of a primary/secondary feeder relationship.	☐	☐
Affiliated because of seasonal student movements.	☐	☐
Affiliated due to systemic direction.	☐	☐

7.2a. **If you are a *HUB SCHOOL, please comment on your relationships with Affiliate Schools:***

In the **context of improving educational processes and outcomes for Indigenous students**, please indicate on the following scale to what degree

(where 1= “not much” to 9= ”a lot”) the statement reflects the situation in your school at the time indicated:

	Your current situation									**In 12 months time in your school**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
7.3a. The schools share professional development activities.																		
7.4a. The relationship leads to staff communicating regularly.																		
7.5a. The relationship leads to staff exchanges taking place to share practices.																		
7.6a. The relationship leads to different approaches to staffing and school organisation.																		
7.7a. The relationship leads to improved student outcomes in your school.																		
7.8a. The relationship leads to enhanced curriculum in your school.																		
7.9a. The relationship leads to improved pedagogy in your school.																		
7.10a. The relationship leads to more effective leadership.																		
7.11a. The relationship leads to a more positive approach to student Indigenous identity.																		
7.12a. The relationship leads to greater capacity to promote Indigenous students’ learning.																		

7.13a. Please comment on any other effects or influences from these Affiliate and/ or Hub school relationships.____

____

____

PLEASE SKIP TO SECTION 8

Section 7b: Stronger Smarter Learning Community Affiliate Schools

We are interested in your experiences of the Stronger Smarter Learning Community as a Hub school or Affiliate school. If you are an SSLC Hub school or Affiliate school please fill out this section. If not, please skip to section 8.

If you are a *HUB SCHOOL*, please skip this section

If you are an *AFFILIATE SCHOOL*, please answer this section

7.1b. **If you are an *AFFILIATE SCHOOL*,** please rank the following reasons for choosing to affiliate with your **Hub School** from 1= "most important" to 7 "least important". Only rank those reasons that had an impact on your decision. If your school is neither a Hub school nor an Affiliate school, please skip to section 8.

	Hub School
Joined Hub as they have similar profile to us (e.g., state defined like schools or like schools as identified by the 'Myschool' website).	☐
Joined Hub on the basis of past professional relations with key staff.	☐
Joined Hub because they are part of our geographically close area/cluster of schools.	☐
Joined Hub because they share our philosophy.	☐
Joined Hub as they are part of our primary/secondary feeder relationship.	☐
Joined Hub because of seasonal student movements between our schools.	☐
Joined Hub due to systemic direction.	☐

7.2b. **If you are an *AFFILIATE SCHOOL, please comment on your relationships with your Hub school:***

In the **context of improving educational processes and outcomes for Indigenous students**, please indicate on the following scale to what degree

(where 1= "not much" to 9= "a lot") the statement reflects the situation in your school at the time indicated:

	Your current situation									**In 12 months time in your school**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
7.3b. The two schools share professional development activities.																		
7.4b. The relationship leads to staff communicating regularly.																		
7.5b. The relationship leads to staff exchanges taking place to share practices.																		
7.6b. The relationship leads to different approaches to staffing and school organisation.																		
7.7b. The relationship leads to improved student outcomes in your school.																		
7.8b. The relationship leads to enhanced curriculum in your school.																		
7.9b. The relationship leads to improved pedagogy in your school.																		
7.10b. The relationship leads to more effective leadership.																		
7.11b. The relationship leads to a more positive approach to student Indigenous identity.																		
7.12b. The relationship leads to greater capacity to promote Indigenous students' learning.																		

7.13b. Please comment on any other effects or influences from this Hub school relationship.

____

____

Section 8: Pedagogy and Curriculum

We are interested in your perspectives of pedagogy and curriculum as a leader **in your school.**

Please indicate on the scale below to what degree (where 1= "not much" to 9= "a lot") the statements reflect the situation in your school at the time indicated.

	When you came to the school									Your current situation									In 12 months time in your school								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
8.1. Indigenous students require strong lesson scaffolding and direct instruction.																											
8.3. Indigenous students require a pre-planned step-by-step approach to learning.																											
8.4. Practical, hands-on lessons (e.g., vocational and technical tasks) are the most effective strategies for engaging Indigenous students.																											
8.5. Effective teaching of Indigenous students requires a strong focus on classroom management and rules.																											
8.6. Indigenous students negotiate their movement and use of space in the classroom (e.g., learning stations, group work).																											
8.7. A comprehensive, packaged approach to teaching and learning is used for Indigenous students (e.g., Jolly Phonics, Letter Land, Multi Lit, Go Maths).																											
8.8. There is provision in the curriculum for Indigenous students to learn from community elders.																											
8.10. Indigenous students are allowed to choose topics and curriculum content in their learning.																											
8.11. Indigenous students receive individually tailored instruction.																											

	When you came to the school									Your current situation									In 12 months time in your school								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
8.12. Indigenous students negotiate their learning tasks (e.g., topics, due dates, criteria).																											
8.13. Indigenous students often explore issues of identity and their 'voice'.																											
8.14. The approaches to teaching reflect Indigenous communication styles (e.g., family interaction patterns, ways of addressing elders, behaviour management strategies).																											
8.15. There is a strong focus for Indigenous learners on real world knowledge (e.g., how to deal with institutions, how to access services, using media).																											
8.16. Indigenous students require a strong emphasis on the Key Learning Areas to achieve successful learning.																											
8.17. The core school curriculum strongly focuses on basic skills of literacy.																											
8.18. The core school curriculum strongly focuses on basic skills of numeracy.																											
8.19. It is essential that Indigenous students engage with traditional Western literary and historical knowledge (e.g., literary 'classics', Greek and Roman myths).																											
8.20. It is essential that Indigenous students engage with high status Western mathematical and scientific knowledge (e.g., Physics, Chemistry, Advanced Mathematics).																											

	When you came to the school									Your current situation									In 12 months time in your school								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
8.21. It is essential that Indigenous students master spoken and written Standard Australian English.																											
8.22. The integration of community knowledges and issues into the classroom is prominent.																											
8.23. There is a strong emphasis on local Indigenous knowledges in the curriculum (e.g., local history, cultural practices, Aboriginal terms and locations).																											
8.24. There is provision for specialised instruction in elements of Indigenous cultural, artistic and musical expression.																											
8.25. There is provision for teaching Indigenous languages.																											
8.26. There is provision for Aboriginal English and Torres Strait Islander Kriol/ Creole to be spoken in classrooms.																											
8.27. Involvement in workplace and community service is an important part of curriculum for Indigenous students at this school.																											
8.28. Indigenous students are exposed to career education.																											
8.29. Exposure to mainstream classics of children's literature is important for Indigenous students (e.g., Roald Dahl, C. S. Lewis, E. B. White).																											

8.30. Do you have any further comments about pedagogy for Indigenous education in your school?

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____

8.31. Some schools organise instruction differently for students with different abilities. What is your school's policy about this for students in all grades?

____

____

____

8.32. Students are grouped by ability within their classes. For all subjects ☐ For some subjects ☐ Not for any ☐ subjects

Section 9: Community Engagement

We are interested in your views of community engagement.

Please indicate on the scale below to what degree (where 1= “not much” to 9= ”a lot”) the statements reflect the situation in your school at the time indicated.

	When you came to the school									**Your current situation**									**In 12 months time in your school**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
9.1. Parents and/ or community members participate in classroom teaching or student learning.																											
9.2. There is a program to encourage parents and/ or community members to become actively involved in the school.																											
9.3. Indigenous community members meet regularly with school governance boards (e.g., councils and leadership groups).																											
9.4. Indigenous community members are consulted on major decisions about the direction of the school.																											

9.5. Indigenous community priorities are taken into account as part of the school planning process.																											
9.6. Indigenous community members have a voice in the everyday running of the school.																											
9.7. An outreach program is maintained to parents/ families who do not visit the school.																											
9.8. School staff have significant roles in meetings and events that involve the Indigenous community.																											

9.9. How does your school promote community engagement?

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____

____

9.10. Do you have any further comments about community engagement in your school?

____

____

Section 10: Sustainability

We are interested in your views about **sustaining Indigenous education strategies**.

Please indicate on the scale below to what degree (where 1= “not much” to 9= ”a lot”) the statements reflect the situation in your school at the time indicated.

	When you came to the school									Your current situation									In 12 months time in your school								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
10.1. The school will have difficulty maintaining its direction and priorities in Indigenous education if a key staff member left.																											
10.2. The school has a plan in place to ensure continuation in its Indigenous education programs.																											
10.3. The shortage of Indigenous staff is a challenge to continued participation in leadership roles.																											
10.4. Staff turnover is a challenge to sustainability of Indigenous education priorities in this school.																											

	When you came to the school									Your current situation									In 12 months time in your school								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
10.5. Timely access to professional development for school staff in relation to Indigenous education is a challenge to the sustainability of our programs.																											
10.6. Teachers' lack of awareness of Indigenous education to maintain and improve current initiatives is an issue in this school.																											
10.7. There is a shortage of teachers committed to Indigenous education to maintain and improve current initiatives in this school.																											
10.8. Teachers at this school have a limited capacity to maintain and improve current Indigenous education initiatives in this school.																											
10.9. Staff in this school experience competing demands on their time that impact on the sustainability of Indigenous education initiatives.																											
10.10. The school's difficulty in ensuring the ongoing engagement of members of the Indigenous community is a challenge to program sustainability.																											
10.11. There are insufficient resources to ensure sustainability of Indigenous education programs in your school.																											

10.12. How do you identify staff members as being key to Indigenous education programs?

10.13. How many key staff members involved in the school's Indigenous education programs have left the school in the last 12 months?

10.14. What effect has turnover of key staff members had on the school's Indigenous education programs?

10.15. Do you have any further comments in relation to the sustainability of Indigenous education strategies in your school?

Appendix 3.2.1 Leaders Survey Measurement Model

Indigenous School Ethos measurement model

The Items

The Indigenous School Ethos Items are given in Table 71

Table 71 Indigenous School Ethos Item Set

Item	Description
LSSC1	The school curriculum is modified to embed Indigenous knowledges and ways of knowing.
LSSC2	Teachers adopt pedagogies that are sensitive to Indigenous students ways of knowing.
LSSC3	Teachers promote communication between Indigenous and non-Indigenous students.
LSSC4	Indigenous signs and symbols (e.g., art work, student murals etc.) are displayed in the classrooms and/or school.
LSSC5	The school as a community actively participates in Indigenous events.
LSSC6	Indigenous people participate in and/or advise on school events.
LSSC7	Indigenous students feel as though they belong in the school.
LSSC8	Indigenous language is used in the school yard.

Descriptives:

Table 72 Indigenous School Ethos Descriptives

	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
LSSC1	1.00	9.00	4.9200	.20434	2.28459	-.416	.217	-.379	.430
LSSC2	1.00	9.00	4.9440	.20831	2.32900	-.391	.217	-.520	.430
LSSC3	1.00	9.00	6.2480	.23381	2.61403	-.961	.217	.157	.430
LSSC4	1.00	9.00	5.9120	.22747	2.54323	-.824	.217	-.072	.430
LSSC5	1.00	9.00	5.9120	.22860	2.55588	-.752	.217	-.150	.430
LSSC6	1.00	9.00	5.6240	.23818	2.66296	-.702	.217	-.529	.430
LSSC7	1.00	9.00	6.7040	.22462	2.51134	-1.353	.217	1.256	.430
LSSC8	1.00	9.00	2.6480	.23780	2.65869	1.300	.217	.334	.430

The minimum and maximum values for each variable lie in the scale range of 1-9 respectively (see Table 72) indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 2.65 to 6.70 on a 9 point scale. The mean is skewed towards the low end of the scale as the mode on all items was a response of "1 – not much". This has implications for conducting statistical analysis that rely on normal distributions of responses. However standard deviations are around 2.5 suggesting range of response is adequate.

Missing value analysis indicated that 111 out of a total of 116 cases were complete with respect to the item list. The remaining 5 cases are not missing at random. It would appear that these cases did not complete any items in the item list – perhaps due to response fatigue. The 8 cases were deleted from the response set.

Both exploratory and confirmatory factor analysis are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should be normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms and P-P plots (see figures below) would indicate some important departures from normality with all variables. This has implications for the estimation techniques used in the confirmatory factor analysis in particular.

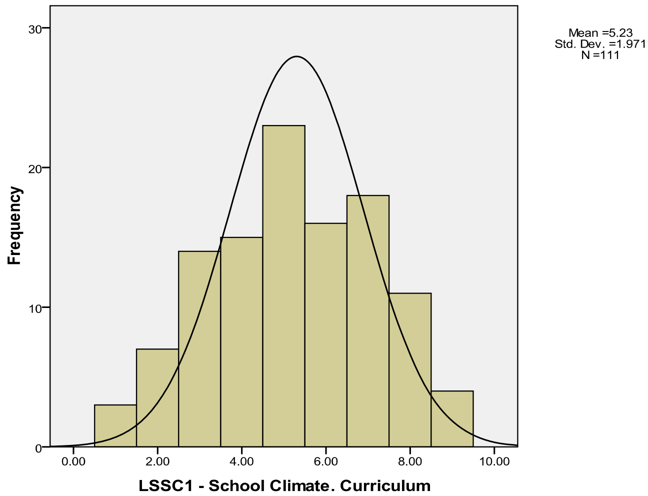

Figure 104 Histogram LSSC1

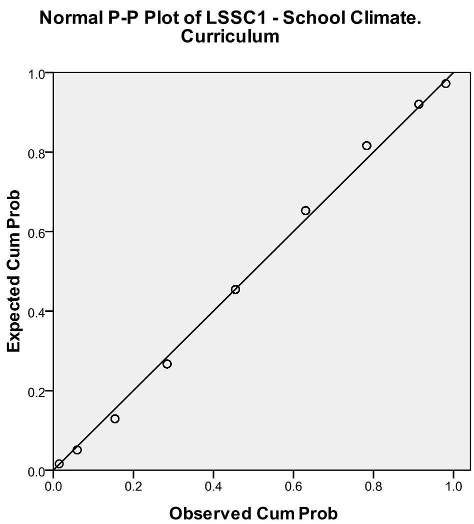

Figure 105 P-P Plot LSSC1

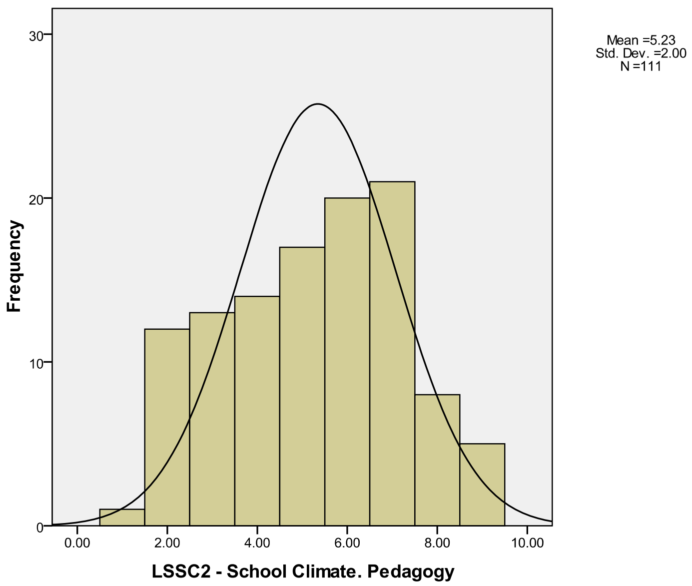

Figure 106 **Histogram LSSC2**

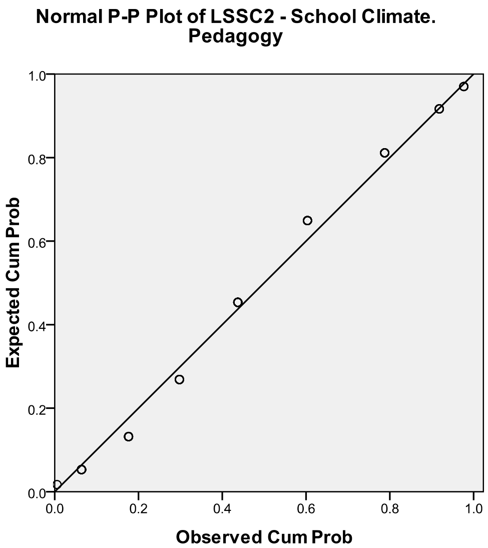

Figure 107 **P-P Plot LSSC2**

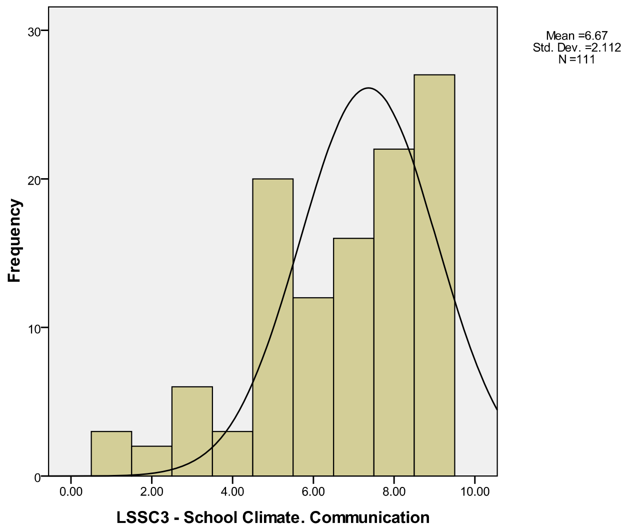

Figure 108 **Histogram LSSC3**

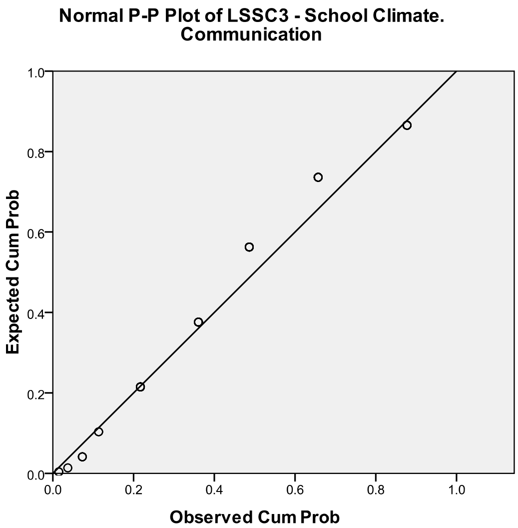

Figure109 **P-P Plot LSSC3**

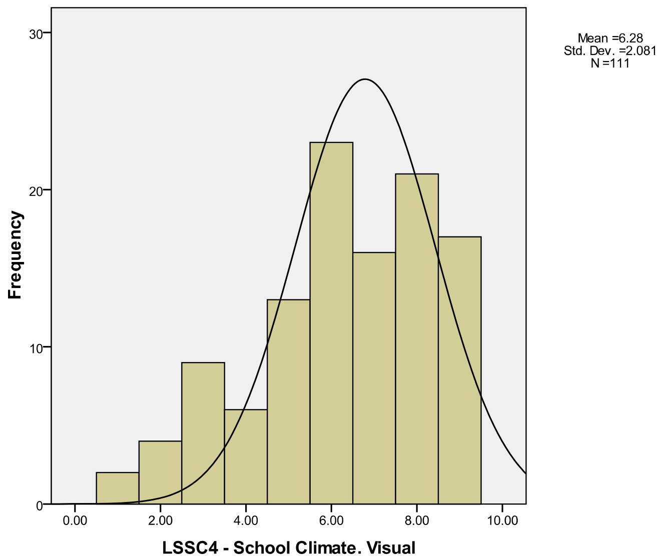

Figure 110 Histogram LSSC4

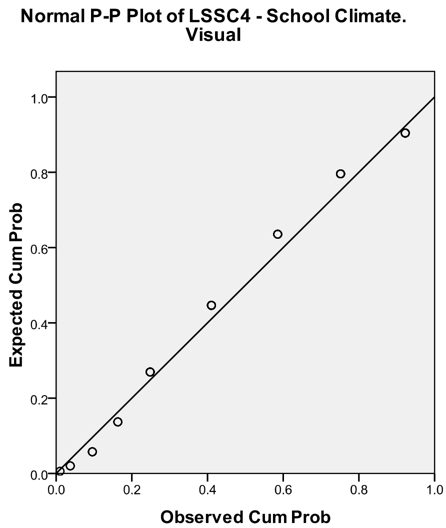

Figure 111 P-P Plot LSSC4

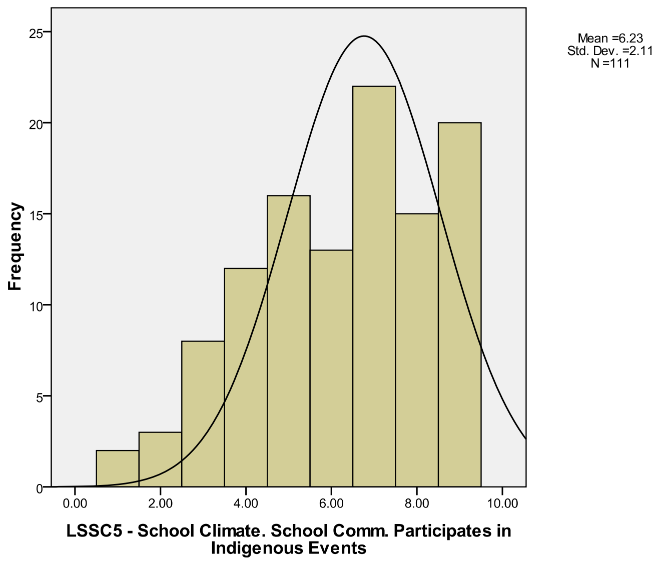

Figure 112 Histogram LSSC5

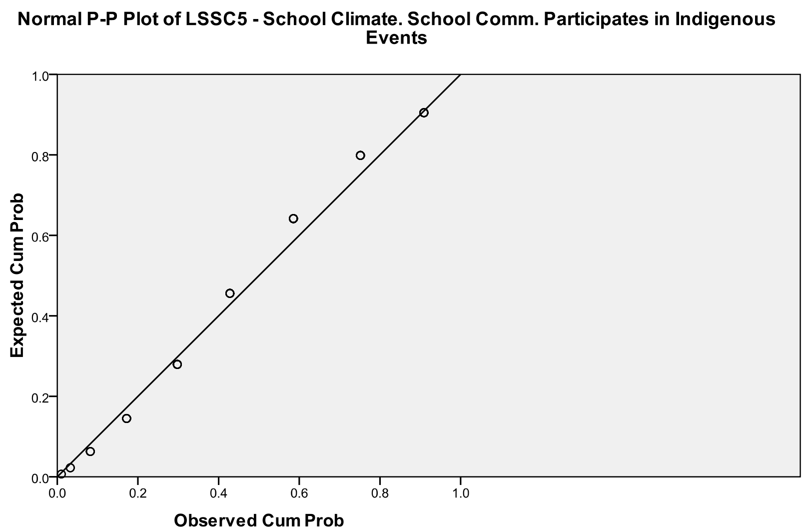

Figure 113 P-P Plot LSSC5

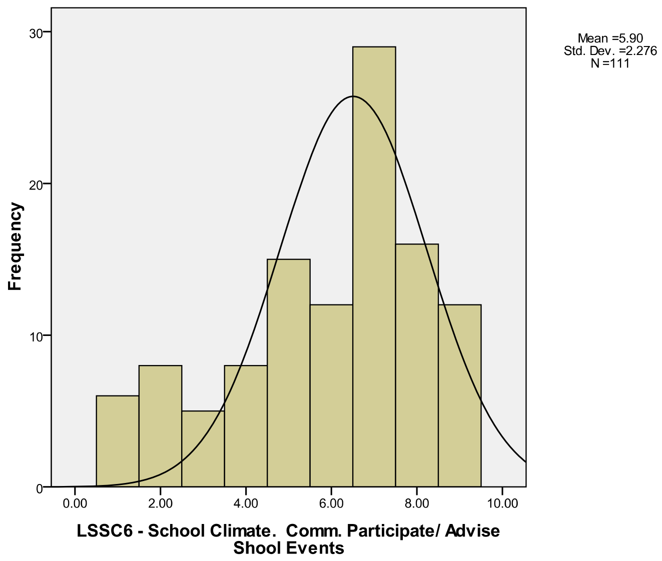

Figure 114 Histogram LSSC6

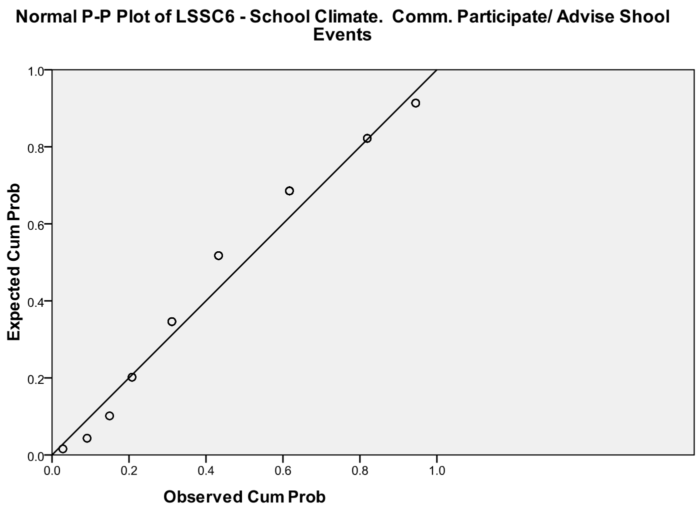

Figure 115 P-P Plot LSSC6

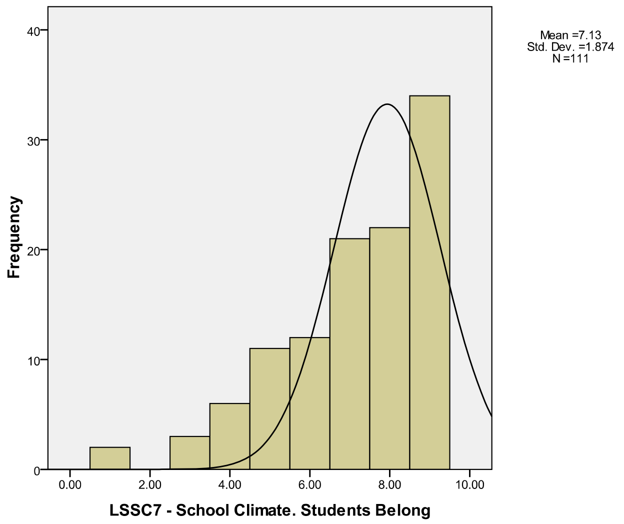

Figure 116 Histogram LSSC7

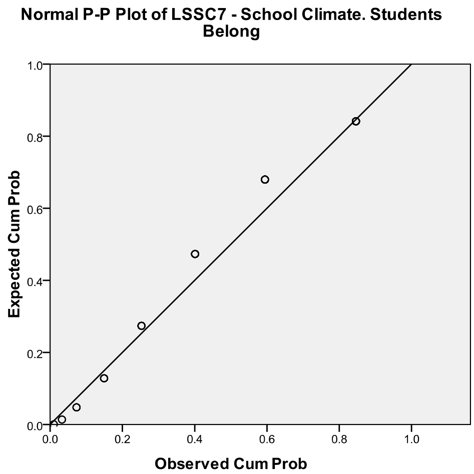

Figure 117 P-P Plot LSSC7

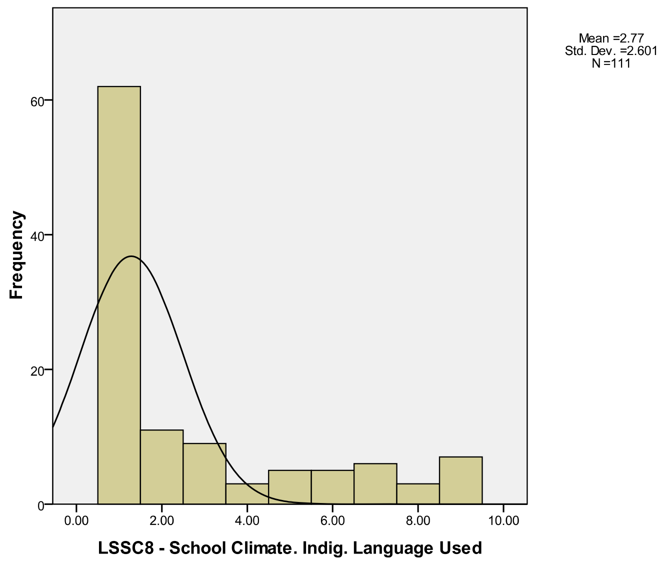

Figure 118 Histogram LSSC8

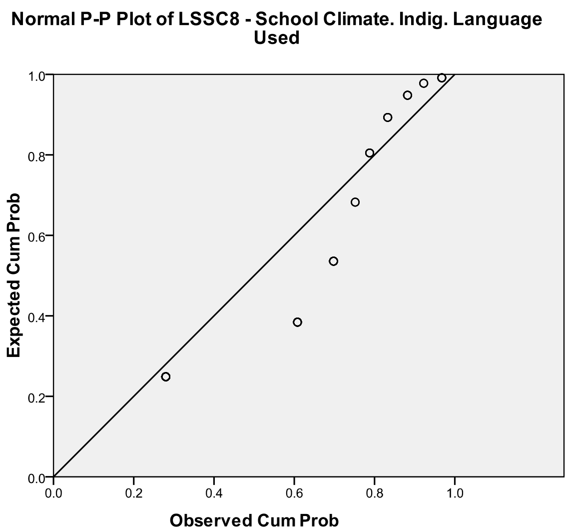

Figure 119 P-P Plot LSSC8

The measurement model

Given the sample used in this analysis is drawn from a constrained population (teachers) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 73).

Table 73 Correlation matrix

	LSSC1	LSSC2	LSSC3	LSSC4	LSSC5	LSSC6	LSSC7	LSSC8
LSSC1	1.000							
LSSC2	.843	1.000						
LSSC3	.685	.646	1.000					
LSSC4	.747	.740	.743	1.000				
LSSC5	.750	.731	.661	.763	1.000			
LSSC6	.596	.666	.519	.660	.784	1.000		
LSSC7	.685	.662	.725	.723	.737	.567	1.000	
LSSC8	.415	.438	.233	.316	.379	.536	.249	1.000

The correlation matrix (refer Table 73) shows the majority of the correlations are greater than 0.4 and most variables have a medium to large correlation with at least 2 or 3 other variables and all are significant. This would suggest there may be some basis for applying an EFA.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.745
Bartlett's Test of Sphericity	Approx. Chi-Square	337.674
	df	28
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity (refer Table 74). Barlett's test value for the correlation matrix is 337.674 with a significance level of 0.000. This suggests there are large correlations among the variables.

The high Kaiser-Meyer-Olkin measure of 0.745 would suggest there is probably a factor structure underlying the variables (refer Table 74).

Table 75 Communalities

Communalities

	Initial	Extraction
LSSC1	.678	.740
LSSC2	.647	.665
LSSC3	.440	.439
LSSC4	.564	.590
LSSC5	.656	.662
LSSC6	.580	.999
LSSC7	.416	.402
LSSC8	.283	.233

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 75) would indicate a reasonable level of variation (small < 0.3) in the items is being explained the latent factor, with the exception of LSSC8. Specifically between 23% and 100% of the variance in items is being explained by the underlying factor structure. Of concern is the extraction, which for items LSSC3, LSSC7 and LSSC8 is explaining less variance than the initial model i.e. a model which uses a linear combination of all other items as a predictor of the item in question. This suggests that there may be at least one additional factor. Therefore, the analysis was re run using an eigenvalue threshold of 0.7 for factor extraction.

Table 76 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.832
Bartlett's Test of Sphericity	Approx. Chi-Square	440.496
	df	28
	Sig.	.000

Acceptable values for Barlett's test of sphericity (χ^2 = 440.496, p=.000) and Kaiser-Meyer-Olkin (0.832) (refer Table 76) were obtained for the revised EFA.

Table 77 Communalities

Communalities

	Initial	Extraction
LSSC1	.678	.740
LSSC2	.647	.665
LSSC3	.440	.439
LSSC4	.564	.590
LSSC5	.656	.662
LSSC6	.580	.999
LSSC7	.416	.402
LSSC8	.283	.233

Communalities (refer Table 77) for items LSSC1-LSSC7 are greater than 0.3 upon extraction, and improved upon from the initial model (except for LSSC7). It was decided to drop LSSC8 from the model due to a communality <0.3. LSS7 was retained as the communality was still greater than >0.3.

Table 78 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.840
Bartlett's Test of Sphericity	Approx. Chi-Square	406.360
	df	21
	Sig.	.000

Acceptable values for Barlett's test of sphericity (χ^2 = 406.360, p=.000) and Kaiser-Meyer-Olkin (0.840) (refer Table 78) were obtained for the revised EFA.

Table 79 Communalities

Communalities

	Initial	Extraction
LSSC1	.669	.734
LSSC2	.646	.661
LSSC3	.439	.442
LSSC4	.561	.593
LSSC5	.651	.664
LSSC6	.499	.999
LSSC7	.415	.406

Communalities (refer Table 79) for all items are greater than 0.3 upon extraction, and improved upon from the initial model. This demonstrates a great improvement on the first two EFA models.

Table 80 **Total Variance Explained**

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.173	59.609	59.609	2.270	32.429	32.429	2.900	41.435	41.435
2	.870	12.430	72.039	2.229	31.848	64.277	1.599	22.842	64.277
3	.617	8.821	80.860						
4	.501	7.161	88.022						
5	.355	5.068	93.089						
6	.293	4.184	97.273						
7	.191	2.727	100.000						

The above table (refer Table 80) shows that two of the eigenvalues exceed 0.7 – as a result 2 factors will be extracted. Factor 1 is accounting for ~ 60% of the total variance of 7 (7 because we have 8 variables and the variance for each variable has been standardised to 1). Factor 2 explains a further 12% of the total variance.

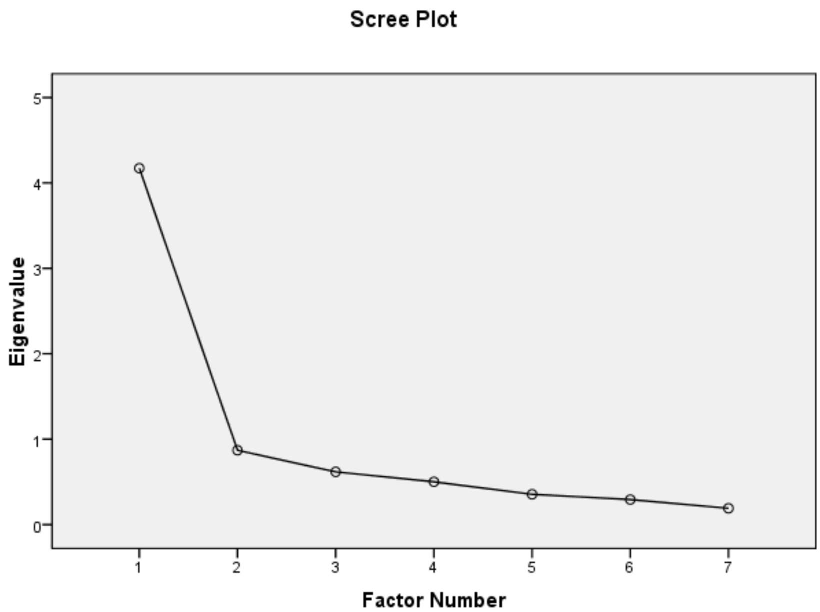

Figure 120 **Scree Plot**

Examination of the scree plot (refer Figure 120) clearly indicates that a two factor solution is appropriate.

Table 81 Factor Matrix

Factor Matrix

	Factor	
	1	2
LSSC6	.999	
LSSC5	.664	.472
LSSC1	.406	.755
LSSC2	.515	.629
LSSC3	.283	.602
LSSC4	.489	.596
LSSC7	.285	.570

The factor matrix (refer Table 81) gives the factor loadings for each item on the underlying constructs. It is clear all items load well on at least one factor.

The χ^2 test for goodness of fit (refer Table 82) is significant, which suggests that the model is a poor fit to the data.

Table 82 Goodness of fit Test

Goodness-of-fit Test

Chi-Square	df	Sig.
27.484	8	.001

Table 83 **Rotated Factor Matrix**

Rotated Factor Matrix

	Factor	
	1	2
LSSC1	**.825**	.230
LSSC2	**.727**	.365
LSSC4	**.688**	.346
LSSC3	**.649**	.144
LSSC7	**.618**	.153
LSSC5	**.606**	*.544*
LSSC6	.215	**.976**

The rotated factor matrix (refer Table 83) indicates a clear single factor solution with LSSC1 – LSSC4 and LSSC7 loading on factor 1, while LSSC6 represents a single factor loading factor 2. LSSC5 is cross loading on both factors.

Confirmatory factor analysis

A key assumption underlying the use of confirmatory factor analysis (refer Table 84) is that the observations are drawn from a continuous and multivariate population. A consequence of contravening this assumption ,if maximum likelihood estimation is used, is the chi-square goodness of fit test will not produce an accurate estimate of fit, rejecting true models and parameter estimates will be biased yielding too many significant results (Anderson & Gerbing, 1988). Even if all univariate distributions are normal (which is not the case in this instance) the joint distributions of the variables may depart substantially from multivariate normality. Mardia's coefficient was used as an indicator of degree of multivariate normality (Mardia, 1970).

Table 84 **Confirmatory Factor Analysis**

Variable	min	max	skew	c.r.	kurtosis	c.r.
LSSC1	1.000	9.000	-.118	-.520	-.694	**-1.532**
LSSC7	1.000	9.000	-1.040	**-4.594**	.755	**1.667**
LSSC5	1.000	9.000	-.473	**-2.090**	-.636	-1.404
LSSC2	1.000	9.000	-.119	-.526	-.863	**-1.906**
LSSC3	1.000	9.000	-.754	**-3.330**	-.138	-.305
LSSC4	1.000	9.000	-.592	**-2.615**	-.429	-.948
Multivariate					**12.607**	**6.959**

The bolded figures in the table (refer Table 84) indicate variables whose distributions depart significantly from normal either by displaying skewness or kurtosis or both. Mardia's coefficient has a value of 12.607 which suggests a moderate to large deviation from multivariate normality is present in the data.

Table 85 **Mahalanobis Distance**

Observation number	Mahalanobis d-squared	p1	p2
2	40.764	.000	.000
44	18.749	.005	.102
68	16.550	.011	.141
7	16.292	.012	.057
43	15.716	.015	.035
19	15.572	.016	.012
15	15.137	.019	.008
90	14.007	.030	.023
33	10.798	.095	.790

Parameter estimates can also be affected by the presence of outliers. Some top level checks for detecting outliers due to possible errors in data entry have been carried out previously. A table of Mahalanobis distances (refer Table 85) was calculated to assist in detecting outliers due to other causes. The figures in the table indicate that case 2 is furthest from the centre of the distribution. Case 2 was deleted from further analysis and normality diagnostics rerun.

Given the data was multivariate normally distributed (Mardia's coefficient of 2.430) it was considered appropriate to use estimation techniques that rely on multivariate normality.

A single factor model of Indigenous School Ethos was specified as a latent variable with 5 reflective indicators. It is normal in a congeneric measurement model to set the scale of the latent variable by fixing the variance of the construct to one rather than the usual practice of setting a factor loading to 1. The model with standardised parameters is illustrated below.

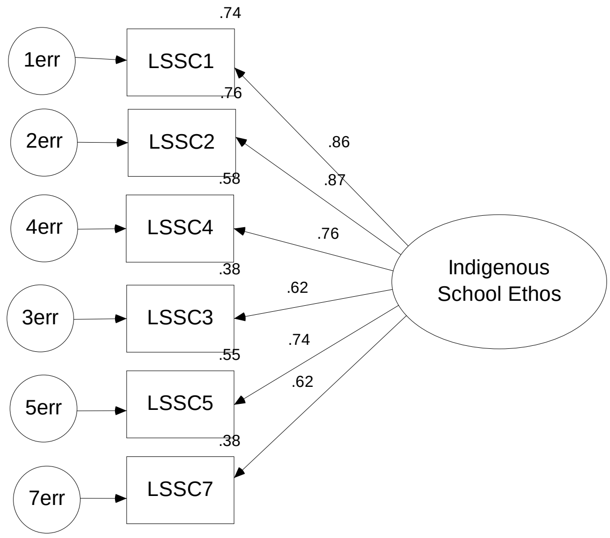

Figure 121 **Measurement Model**

The model (refer Figure 121) converged but did not fit the data χ^2 $p = 0.000$. The factor coefficients ranged from a low of 0.62 to a high of 0.87. All coefficients exceed 0.4 so on this basis all items would be retained if the model was a good fit.

An examination of the MI revealed that the chi square value would decrease by at least 11 units if the covariance of the error terms associated with the indicators LSSC1 and LSSC2 was freely estimated. As per the teacher survey, LSSC1 was dropped from the model on the basis that respondents were possibly conflating LSSC1 and LSSC2 caused by confusion over the definition and scope of terms "pedagogy" and "curriculum".

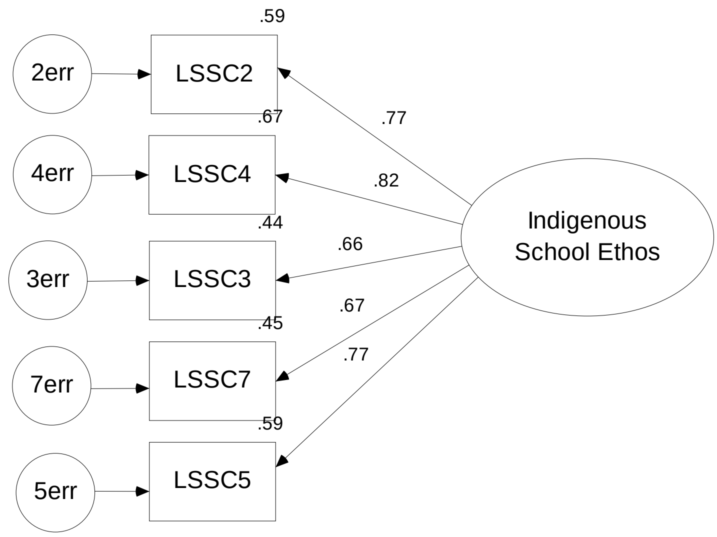

Figure 122 **Measurement Model**

The model (refer Figure 122) converged and was a good fit. The factor coefficients ranged from a low of .66 to a high of .82 – which is a good result.

In summary – a one factor model of the latent construct School Ethos was specified as a congeneric model latent variables with 5 reflective indicators. The data fit the model well χ^2 (5) = 10.831, p = .055, RMSEA = .101 (.000, .184), GFI = .967, TLI = .951 and CFI = 1.000.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case neither the tau model (χ^2 (9) = 18.819, p = .027) nor the parallel model (χ^2 (14) = 28.439, p = .012) fitted the data well so the congeneric model is retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). LSSC2 (.593), LSSC3 (.439), LSSC4 (.672), LSSC5 (.591) and LSSC7 (.449). LSSC2, LSSC4 and LSSC5 is above the "good" cut-off while LSSC3 and LSSC7 are above the acceptable cut off. In summary the Indigenous School Ethos factor is explaining between 44% and 67% of the variance across the individual indicator variables.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for Indigenous School Ethos factor is .86; well above the recommended cut off.

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the factor Indigenous School Ethos was.55. In other words the factor Indigenous School Ethos is accounting in total for 55% of the variation in the indicator variables which is just above the recommended cut off of 50%.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Indigenous School Ethos factor model was .87 which represents a high reliability (Hancock & Mueller) and is in line with previous measures calculated.

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The Indigenous School Ethos factor model fitted well as confirmed by the non significant χ^2 supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were LSSC2 (9.232), LSSC3 (7.546), LSSC4 (10.083), LSSC5 (9.212) and LSSC7 (7.658), all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .77, .66, .82, .77 and .67. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

Index score

A scale score for the Indigenous School Ethos construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient (refer Table 86) of each indicator and summing.

Table 86 – Regression Weights Indigenous School Ethos

	SC2	SC3	SC4	SC5	SC7
Raw Regression Weights	0.126	0.075	0.164	0.119	0.092
Proportional Regression Weights	0.219	0.130	0.285	0.207	0.160

The scale scores then becomes:

Indigenous School Ethos Score = (LSSC2*.219) + (LSSC3*.130) + (LSSC4*.285) + (LSSC5*.207) + (LSSC7*.160)

This approach ensures the estimates of the scale score adjusted for measurement error is proportionally weighted by the actual contribution made by each indicator. The proportional regression weight scores sum to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same 'metric' as that of indicators for the construct.

Appendix 3.2.2 Innovative School Staffing Measurement Model

Table 87 Innovative School Staffing Measurement Model

The Items

Items	Description
LSSS1	The school has the latitude to select teaching and professional staff.
LSSS2	Indigenous teachers are actively sought after by the school.
LSSS3	Teachers with experience/ expertise in Indigenous education are actively sought after by the school.
LSSS4	The school recruits Indigenous staff in professional support roles (e.g., teacher aide/ community education counsellor).
LSSS5	The school recruits Indigenous staff in support roles (e.g., cleaner, groundskeeper, gardener, or bus driver).
LSSS6	The school recruits administrative personnel in management positions with Indigenous experience or expertise (e.g., Heads of Department, Heads of Curriculum and Deputies).
LSSS7	The specialist teachers have experience or expertise with Indigenous students (e.g., speech pathologists, ESL, or special education).
LSSS8	The school seeks advice from the Indigenous Community on staffing.
LSSS9	The school has an induction process for teachers on Indigenous issues that incorporates community involvement.
LSSS10	There is sufficient budgetary capacity to support flexible approaches to staffing.

Table 88 **Descriptives**

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
LSSS1	81	1.00	9.00	4.3086	.31014	2.79125	.225	.267	-1.306	.529
LSSS2	101	1.00	9.00	4.2475	.28990	2.91344	.324	.240	-1.358	.476
LSSS3	101	1.00	9.00	4.9406	.30534	3.06862	-.009	.240	-1.521	.476
LSSS4	101	1.00	9.00	5.9307	.27150	2.72858	-.519	.240	-.992	.476
LSSS5	101	1.00	9.00	3.6139	.31085	3.12400	.781	.240	-1.016	.476
LSSS6	101	1.00	9.00	3.1881	.28134	2.82741	.896	.240	-.757	.476
LSSS7	101	1.00	9.00	3.8812	.25728	2.58568	.449	.240	-1.011	.476
LSSS8	101	1.00	9.00	4.0297	.28923	2.90674	.404	.240	-1.324	.476
LSSS9	101	1.00	9.00	3.7030	.25700	2.58281	.489	.240	-1.141	.476
LSSS10	101	1.00	9.00	3.8119	.26911	2.70449	.358	.240	-1.382	.476

The minimum and maximum values for each variable lie in the scale range of 1-9 (refer Tables above) respectively indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 3.18 to 5.93 on a 9 point scale. The mean is skewed towards the low end of the scale as the mode on all items was a response of "1 – not much". This has implications for conducting statistical analysis that rely on normal distributions of responses. However standard deviations are around 2.75 suggesting range of response is adequate.

Missing value analysis indicated that 81 out of a total of 116 cases were complete with respect to the item list. The remaining cases are not missing at random. It would appear that 15 of these cases did not complete any items in the item list – perhaps due to response fatigue. These cases were deleted from the response set. The remaining 20 were missing LSSS1 due to the selection of a non applicable option. A decision was made to use maximum likelihood estimation (expectation-maximization EM) to impute likely values for those missing.

Both exploratory and confirmatory factor analysis are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should be normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms and P-P plots (refer Figures below) would indicate some important departures from normality with all variables. This has implications for the estimation techniques used in the confirmatory factor analysis in particular.

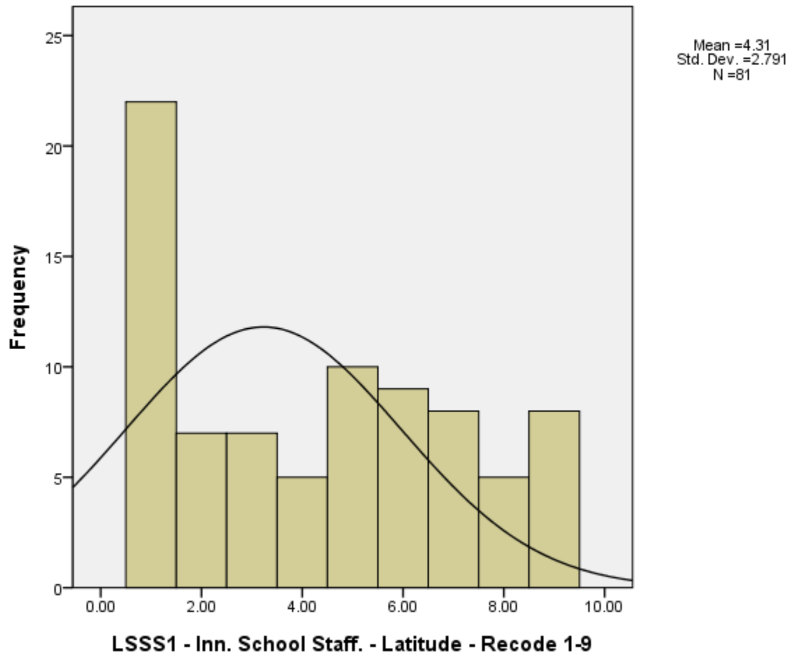

Figure 123 Histogram LSSS1

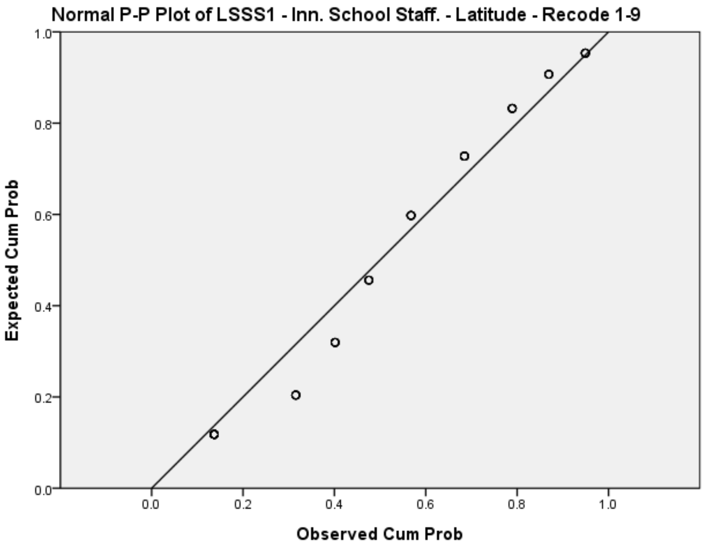

Figure 124 **P-P Plot LSSS1**

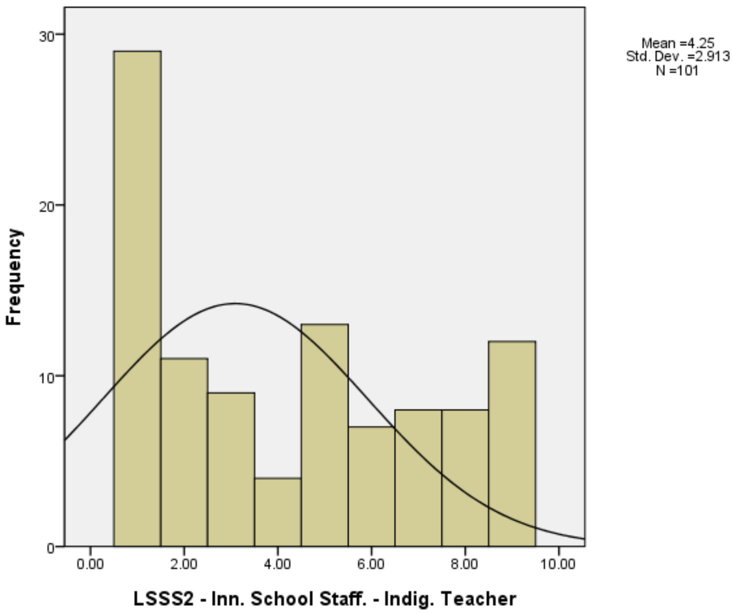

Figure 125 **Histogram LSSS2**

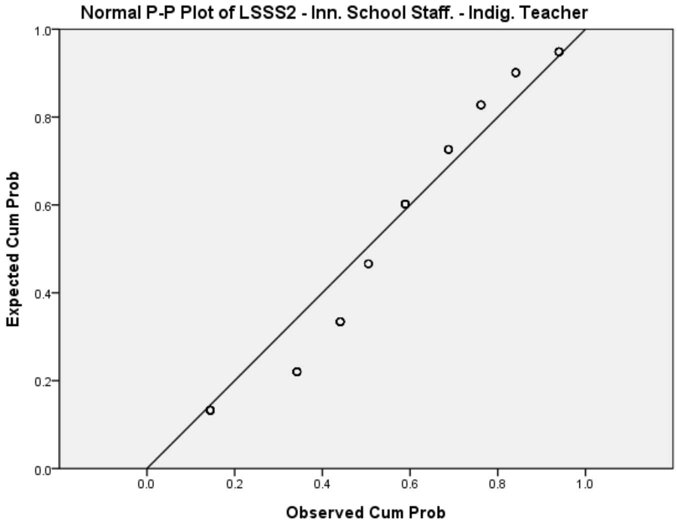

Figure 126 **P-P Plot LSSS2**

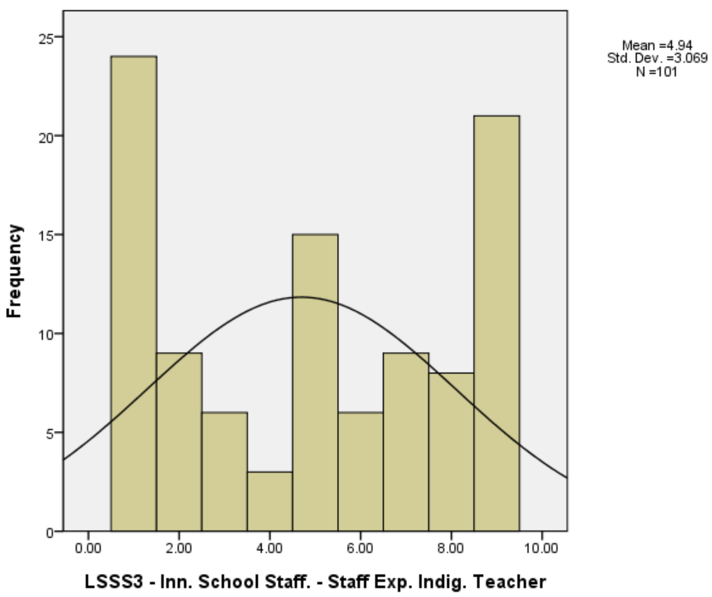

Figure 127 **Histogram LSSS3**

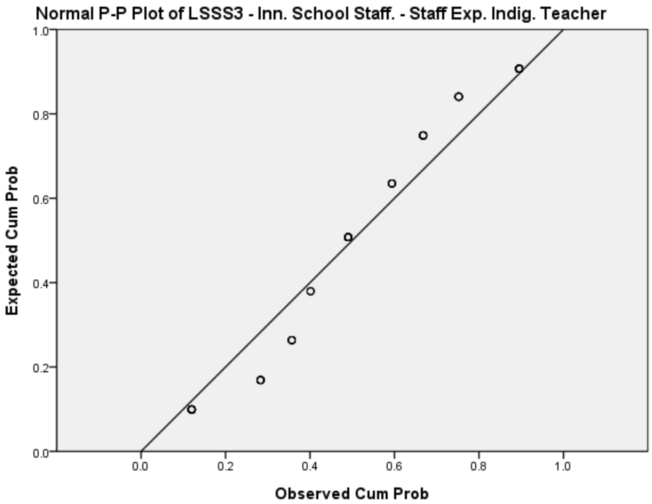

Figure 128 **P-P Plot LSSS3**

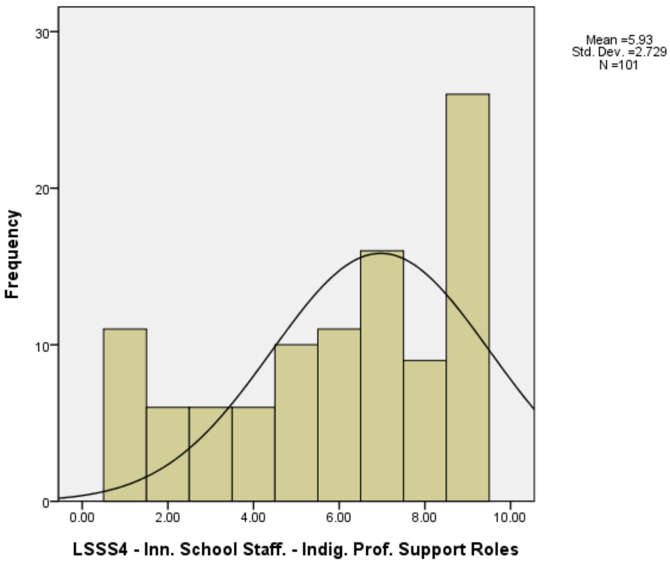

Figure 129 Histogram LSSS4

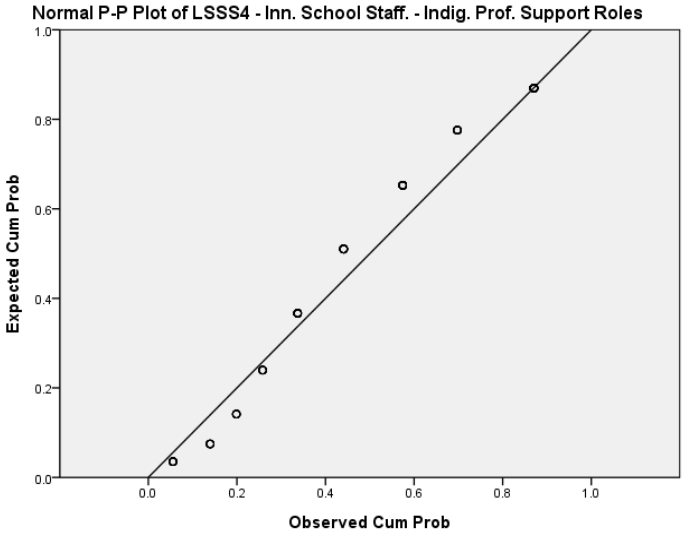

Figure 130 P-P Plot LSSS4

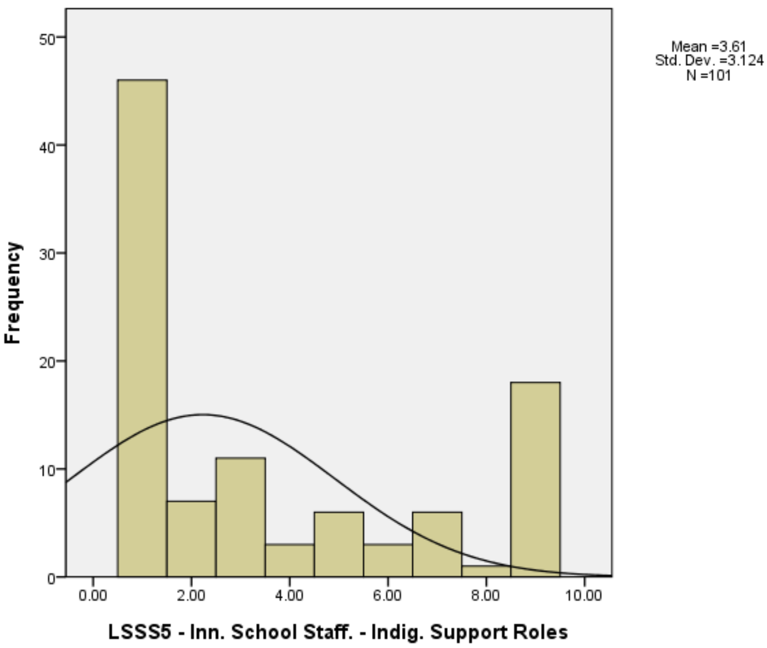

Figure 131 Histogram LSSS5

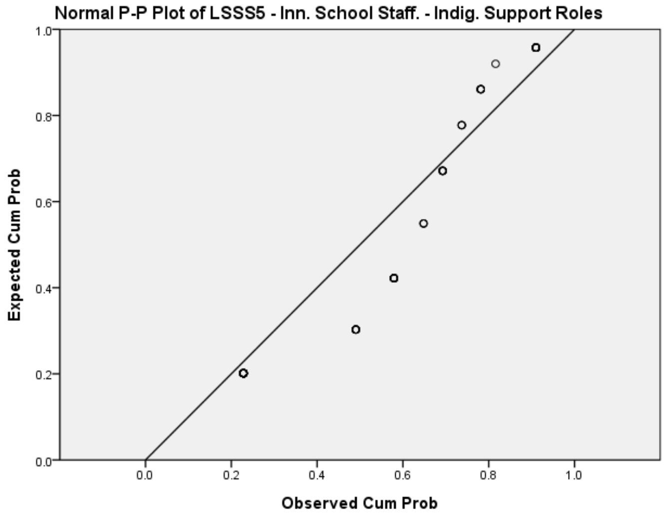

Figure 132 **P-P Plot LSSS5**

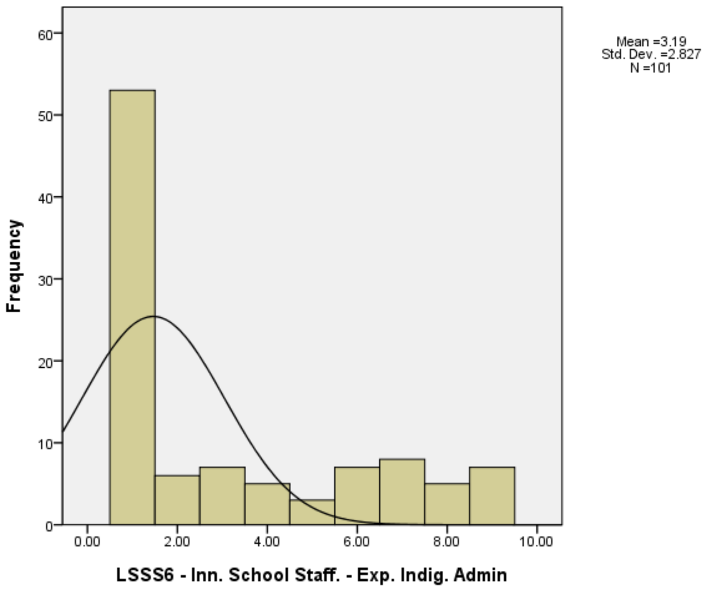

Figure 133 **Histogram LSSS6**

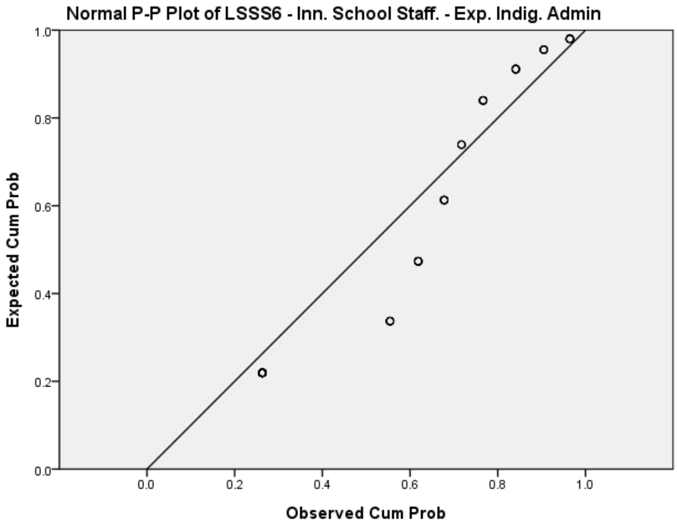

Figure 134 **P-P Plot LSSS6**

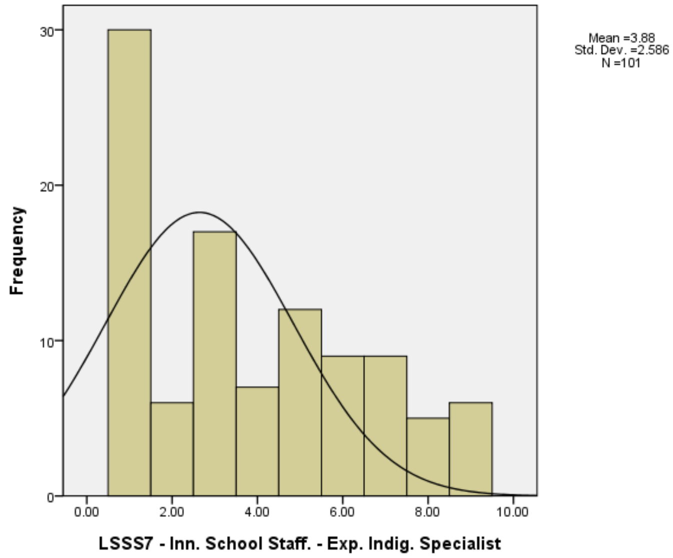

Figure 135 **Histogram LSSS7**

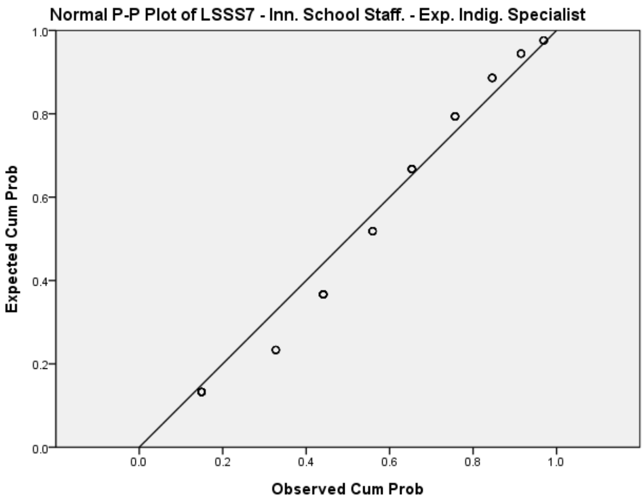

Figure 136 **P-P Plot LSSS7**

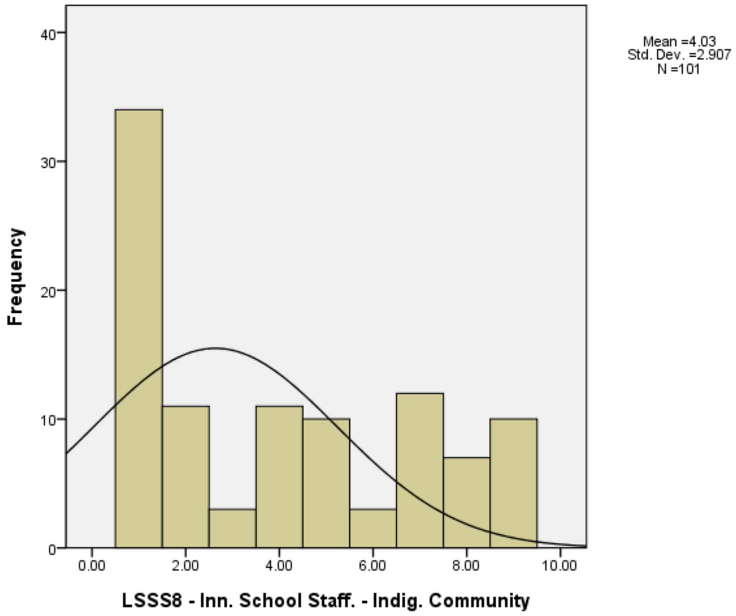

Figure 137 **Histogram LSSS8**

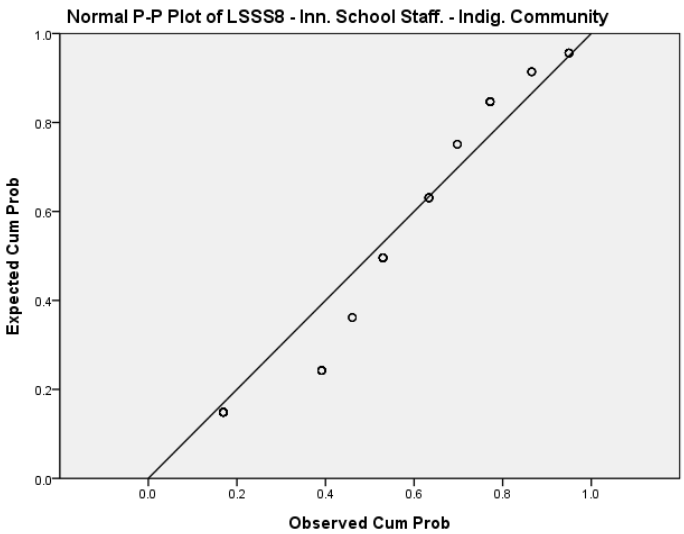

Figure 138 **P-P Plot LSSS8**

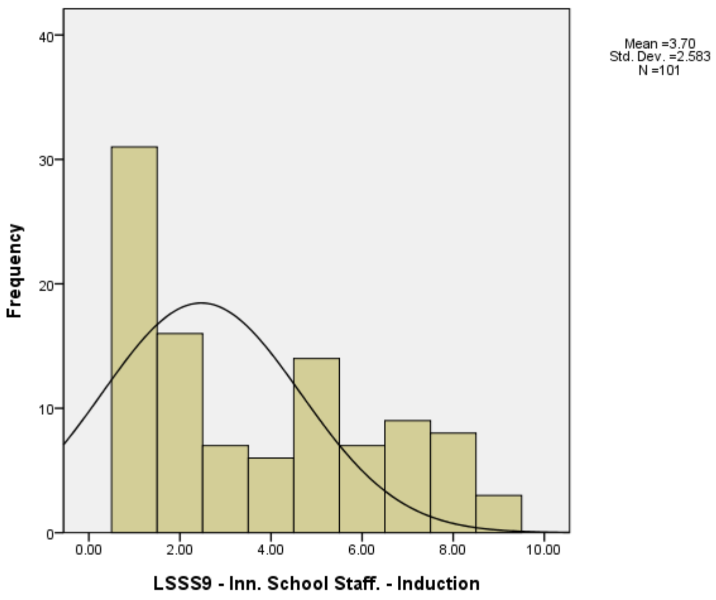

Figure 139 **Histogram LSSS9**

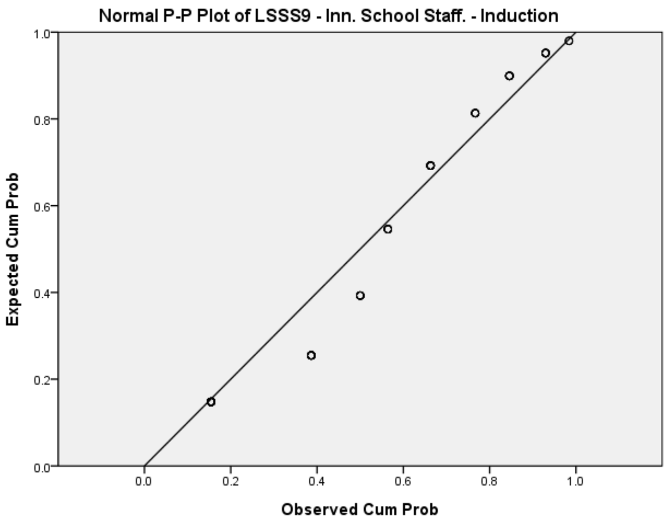

Figure 140 **P-P Plot LSSS9**

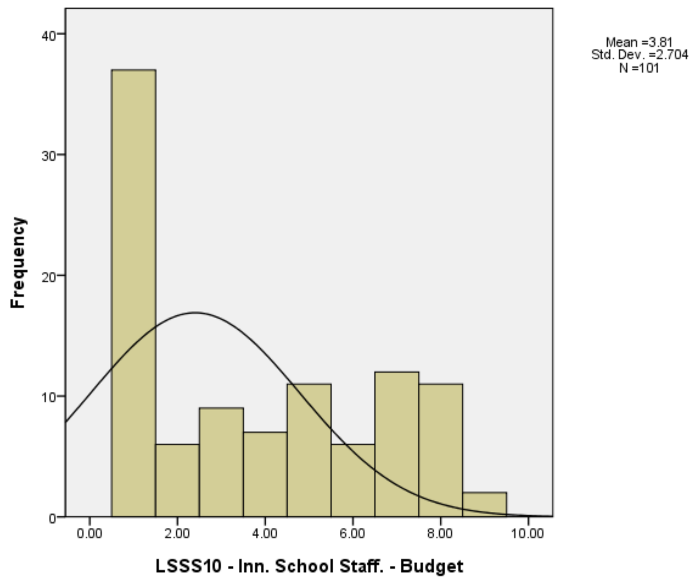

Figure 141 **Histogram LSSS10**

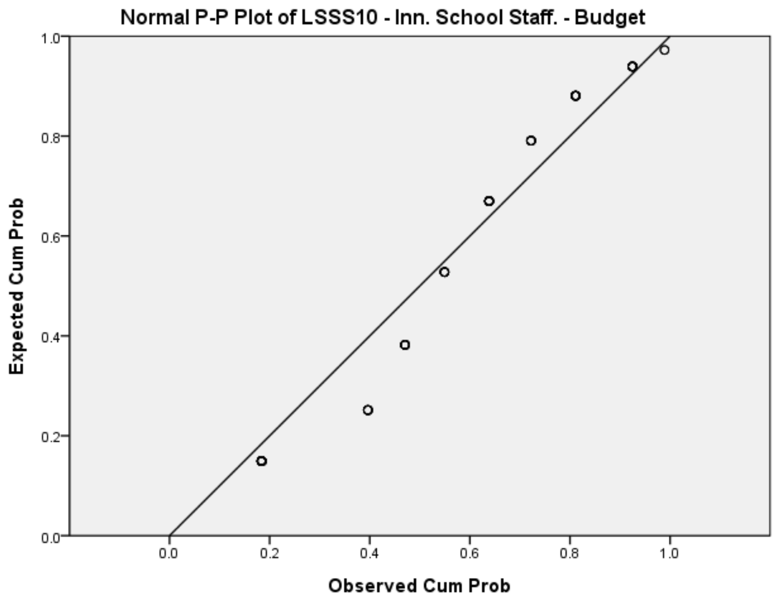

Figure 142 **P-P Plot LSSS10**

The measurement model

Given the sample used in this analysis is drawn from a constrained population (leaders) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix.

Table 89 Correlation Matrix

	LSSS1	LSSS2	LSSS3	LSSS4	LSSS5	LSSS6	LSSS7	LSSS8	LSSS9	LSSS10
LSSS1	1									
LSSS2	.248*	1								
LSISS3	.443**	.781**	1							
LSSS4	.272*	.627**	.683**	1						
LSSS5	.412**	.526**	.518**	.539**	1					
LSSS6	.324**	.547**	.598**	.453**	.554**	1				
LSSS7	.316**	.399**	.605**	.372**	.419**	.426**	1			
LSSS8	.188	.413**	.478**	.524**	.421**	.329**	.262**	1		
LSSS9	.437**	.450**	.559**	.424**	.394**	.386**	.481**	.291**	1	
LSSS10	.396**	.330**	.452**	.226*	.353**	.431**	.554**	.241*	.503**	1

The correlation matrix (refer Table 89) shows the majority of the correlations are greater than 0.4, with the exception of LSSS1 and LSSS10. Most variables have a medium to large correlation with at least 2 or 3 other variables and all are significant. This would suggest there may be some basis for applying an EFA.

Table 90 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.849
Bartlett's Test of Sphericity	Approx. Chi-Square	396.624
	df	45
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 396.624 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.849 would suggest there is probably a factor structure underlying the variables (refer Table 90).

Table 91 **Communalities**

Communalities

	Initial	Extraction
LSSS1	.389	.337
LSSS2	.641	.688
LSISS3	.786	.846
LSSS4	.587	.617
LSSS5	.501	.434
LSSS6	.464	.451
LSSS7	.452	.473
LSSS8	.450	.397
LSSS9	.376	.416
LSSS10	.391	.527

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 91) would indicate a reasonable level of variation (small < 0.3) in the items is being explained the latent factor. Specifically between 34% and 84% of the variance in items is being explained by the underlying factor structure. Of concern is the extraction, which for items LSSS1, LSSS5, LSSS6 and LSSS8 is explaining less variance than the initial model i.e. a model which uses a linear combination of all other items as a predictor of the item in question. It was decided to lower the eigenvalue minimum for extraction to 0.7 to allow for more factors to be extracted, given that nearly half the items were not adequately represented by the current extracted solution. This solved the issue for LSSS5, LSSS6 and LSSS8, however the variance extracted by the model for LSSS1 was <0.3 and so the EFA was rerun without LSSS1.

Table 92 **KMO and Bartlett's Test**

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.855
Bartlett's Test of Sphericity	Approx. Chi-Square	430.409
	df	36
	Sig.	.000

Acceptable values for Barlett's test of sphericity (χ^2 = 430.409, p=.000) and Kaiser-Meyer-Olkin (0.855) (refer Table 92) were obtained for the revised EFA.

Table 93 **Communalities**

Communalities

	Initial	Extraction
LSSS2	.658	.670
LSISS3	.775	.999
LSSS4	.583	.624
LSSS5	.458	.640
LSSS6	.453	.469
LSSS7	.476	.489
LSSS8	.325	.329
LSSS9	.390	.400
LSSS10	.452	.817

Communalities (refer Table 93) for all items are greater than 0.3 upon extraction, and improved upon from the initial model. This demonstrates a great improvement on the EFA with Eigenvalues greater than 1.

Table 94 **Total Variance Explained**

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.646	51.621	51.621	3.748	41.647	41.647	1.920	21.331	21.331
2	1.137	12.634	64.255	.954	10.598	52.245	1.795	19.950	41.281
3	.706	7.850	72.105	.735	8.161	60.406	1.721	19.126	60.406
4	.632	7.025	79.130						
5	.550	6.110	85.239						
6	.503	5.590	90.829						
7	.353	3.918	94.747						
8	.317	3.517	98.264						
9	.156	1.736	100.000						

The above table (refer table 94) shows that three of the eigenvalues exceed 0.7 – as a result 3 factors will be extracted. Factor 1 is accounting for ~ 52% of the total variance of 9 (9 because we have 8 variables and the variance for each variable has been standardised to 1). Factor 2 explains a further 13% of the total variance, and factor 3 explains 8% of the total variance (refer Table 94).

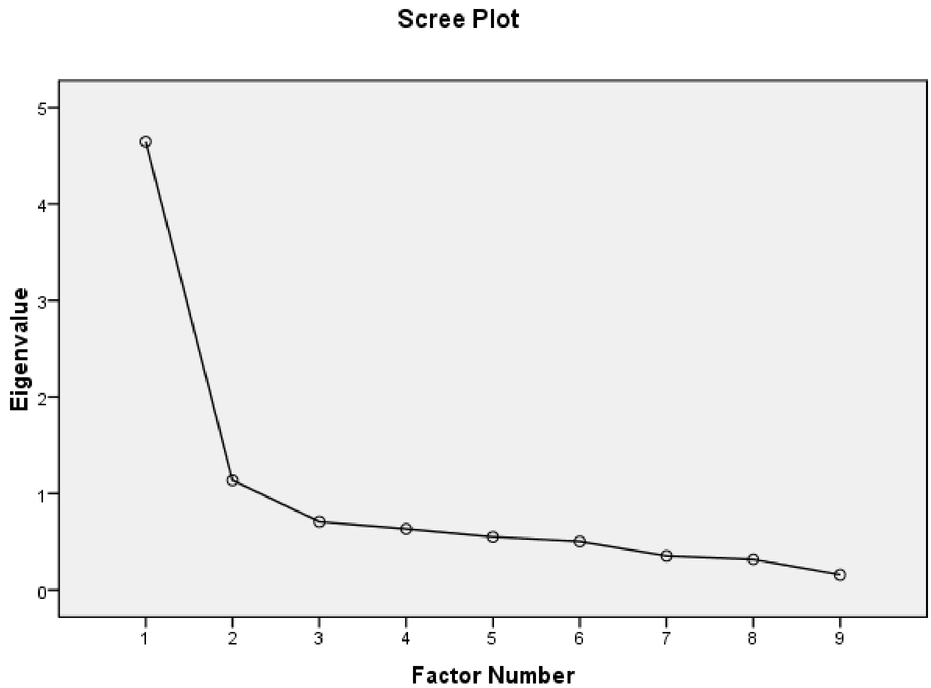

Figure 143 **Scree Plot**

Examination of the scree plot (refer Figure 143) clearly indicates that a three factor solution is appropriate.

The factor matrix (refer Table 95) gives the factor loadings for each item on the underlying constructs. It is clear all items load well on at least one factor.

Table 95 Factor Matrix

Factor Matrix[a]

	Factor		
	1	2	3
LSSS3	.999		
LSSS2	.784		.234
LSSS4	.683		.390
LSSS7	.585	.379	
LSSS6	.580	.238	.274
LSSS9	.545	.318	
LSSS8	.477		.317
LSSS10	.459	.773	
LSSS5	.504	.219	.582

The χ^2 test for goodness of fit (refer Table 96) is not significant, which suggests that the model is a good fit to the data.

Table 96 Goodness-of-fit Test

Goodness-of-fit Test

Chi-Square	df	Sig.
11.289	12	.504

While the rotated factor matrix (refer table 97) does indicate the presence of three factors (bolded), it is important to note that there are also cross loadings (italicised). The first factor refers to the recruitment of staff who are either Indigenous themselves or experienced in Indigenous education and issues, while the second factor refers to resources concerned with staffing. The third factor refers to the recruitment of teachers specifically, however it overlaps with the first factor. It was decided to collapse the first and third factor, and drop LSSS3 because it cross loaded onto factors 1 and 2.

Table 97 Rotated Factor Matrix

Rotated Factor Matrix

	Factor		
	1	2	3
LSSS5	**.744**	.251	.152
LSSS4	**.608**	.105	*.493*
LSSS6	**.491**	.372	.300
LSSS8	**.474**	.145	.289
LSSS10	.153	**.888**	
LSSS7	.197	**.579**	.340
LSSS9	.273	**.484**	.302
LSSS3	.370	.388	**.843**
LSSS2	*.507*	.232	**.600**

Confirmatory factor analysis

A two factor model of Innovative School Staffing was specified as a latent variable with 3 and 5 reflective indicators, respectively. It is normal in a congeneric measurement model (refer Figure 144) to set the scale of the latent variable by fixing the variance of the construct to one rather than the usual practice of setting a factor loading to 1. The model with standardised parameters is illustrated below.

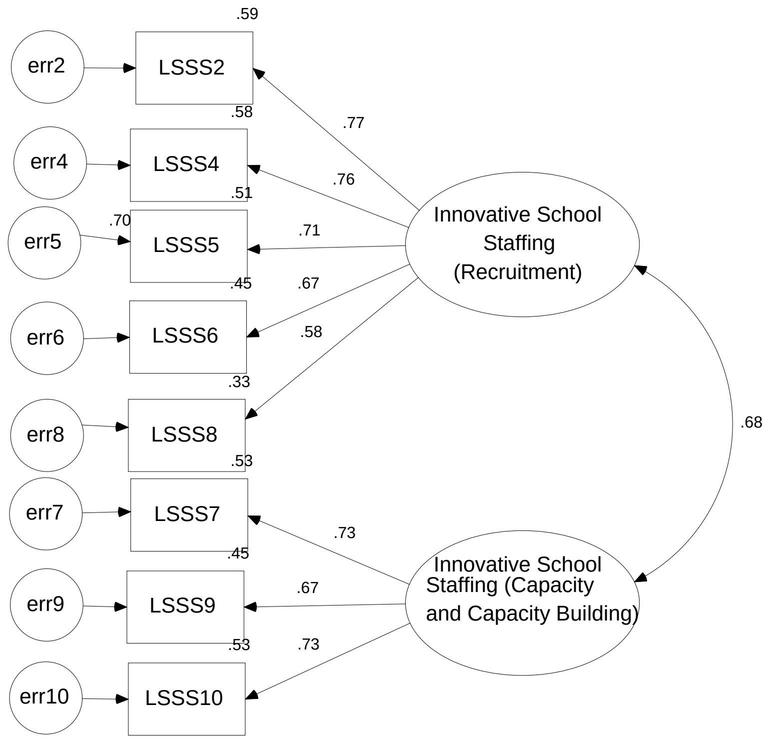

Figure 144 **Measurement Model**

The model converged and was a good fit to the data χ^2 (19)= 24.383, *p*= .182, RMSEA = .053 (.000, .108), GFI = .941, TLI = .970 and CFI = .980. The factor coefficients ranged from a low of 0.58 to a high of 0.77. All coefficients exceed 0.4 so on this basis all items would be retained if the model was a good fit.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case the tau model (χ^2 (26)= 29.822, *p*= .275) fitted the data better than the congeneric model, but not the parallel model (χ^2 (32)= 40.068, *p*= .155). Therefore congeneric model is retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). LSSS7 (.527), LSSS9 (.447), LSSS10 (.531), LSSS2 (.589), LSSS4 (.579), LSSS5 (.509), LSSS6 (.451) and LSSS8 (.333). LSSS7, LSSS10, LSSS2, LSSS4, and LSSS5 are above the "good" cut-off while LSSS9, LSSS6, and LSSS8 are above the acceptable cut off (Fornell & Larcker, 1981). In summary the Innovative School Staffing model is explaining between 33% and 59% of the variance across the individual indicator variables.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The two factors were examined separately for reliability and validity, and only direct effects were considered. The construct reliability for the Innovative School Staffing model is .82 for the recruitment construct, and .77 for the capacity and capacity building construct; well above the recommended cut off.

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the Innovative School Staffing model was .47 for the recruitment construct, and .53 for the capacity and capacity building construct. In other words the factors are accounting for 47% and 53% of the variation in their respective indicator variables which is close to the recommended cut off of 50%.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Innovative School Staffing factor model was .82 for Innovative School Staffing (Recruitment) and .77 for Innovative

School Staffing (Capacity and Capacity Building) which represents a high reliability (Hancock & Mueller, 2001) and is in line with previous measures calculated.

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The Innovative School Staffing factor model fitted well as confirmed by the non significant χ^2 supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were LSSS9 (6.569), LSSS10 (7.356), LSSS7 (7.307), LSSS2 (8.485), LSSS4 (8.341), LSSS6 (7.052), LSSS8 (5.865) and LSSS5 (7.662), all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .67, .73, .73, .77, .76, .67, .58 and .71. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

Index score

A scale score for the Innovative School Staffing (refer Tables below) construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing. Note that scale scores are based on the Tau equivalent model.

Table 98 Innovative School Staffing Regression Weights

Innovative School Staffing – (Recruitment)	SS2	SS4	SS5	SS6	SS7	SS8	SS9	SS10
Raw Regression Weights	0.086	0.102	0.063	0.074	0.024	0.059	0.022	0.022
Proportional Regression Weights	0.190	0.226	0.139	0.164	0.053	0.131	0.049	0.049

Table 99 Innovative School Staffing Regression Weights

Innovative School Staffing (Capacity and Capacity Building)	SS2	SS4	SS5	SS6	SS7	SS8	SS9	SS10
Raw Regression Weights	0.021	0.025	0.015	0.018	0.124	0.014	0.111	0.113
Proportional Regression Weights	0.048	0.057	0.034	0.041	0.281	0.032	0.252	0.256

The scale scores then become:

Innovative School Staffing (Recruitment) = (LSSS2*.190) + (LSSS4*.226) + (LSSS5*.139) + (LSSS6*.164) + (LSSS7*.053) + (LSSS8*.131) + (LSSS9*.049) + (LSSS10*.049)

Innovative School Staffing (Capacity and Capacity Building) = (LSSS2*.048) + (LSSS4*.057) + (LSSS5*.034) + (LSSS6*.041) + (LSSS7*.281) + (LSSS8*.032) + (LSSS9*.252) + (LSSS10*.256)

Appendix 3.2.3 Innovative School Modelling Measurement Model

The Items

Table 100 Innovative School Modelling Measurement Model

Item name	Description
LSSM1	The school has before and/or after school support programs that take into account both the needs of the community and those of the Indigenous students (e.g., homework programs).
LSSM2	Flexible timetabling allows the school to accommodate community and student needs (e.g., Indigenous community events, student mobility, family circumstances).
LSSM3	The school has a dedicated space or centre for Indigenous students and/ or community members.
LSSM4	The school has policies and procedures in place to monitor and respond to student mobility between schools.

Descriptives:

Table 101 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
LSSM1	98	1.00	9.00	3.6531	.25992	2.57306	.435	.244	-1.173	.483
LSSM2	98	1.00	9.00	3.9898	.26489	2.62225	.372	.244	-1.061	.483
LSSM3	98	1.00	9.00	4.2347	.33165	3.28320	.323	.244	-1.573	.483
LSSM4	98	1.00	9.00	4.6122	.27811	2.75319	.206	.244	-1.265	.483

The minimum and maximum values for each variable lie in the scale range of 1-9 (refer Table 101) respectively indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 3.65 to 4.61 on a 9 point scale. The mean of the scale is approximately 4, and standard deviations are around 2.75 suggesting range of response is adequate.

Missing value analysis indicated that 98 out of a total of 116 cases were complete with respect to the item list. The remaining 18 cases are not missing at random. It would appear that these cases did not complete any items in the item list – perhaps due to response fatigue. The 18 cases were deleted from the response set.

Both exploratory and confirmatory factor analysis are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should be normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms and P-P (refer Figures below) plots would indicate some important departures from normality with all variables. This has implications for the estimation techniques used in the confirmatory factor analysis in particular.

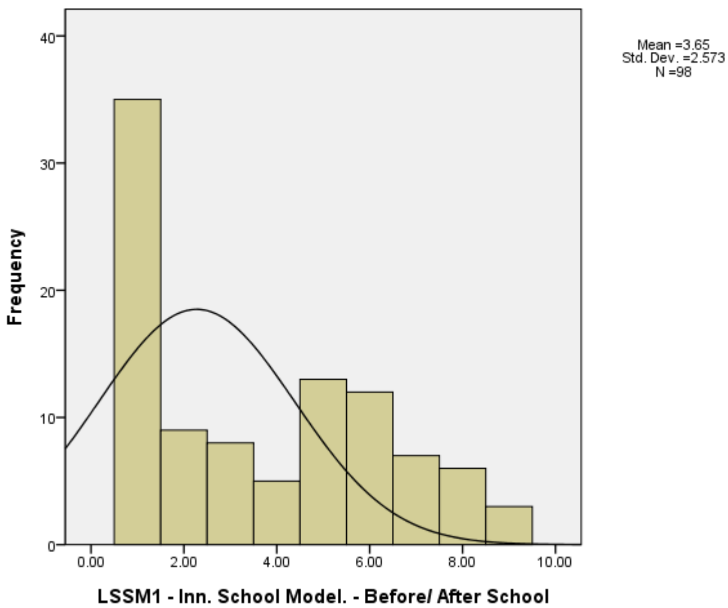

Figure 145 Histogram LSSM1

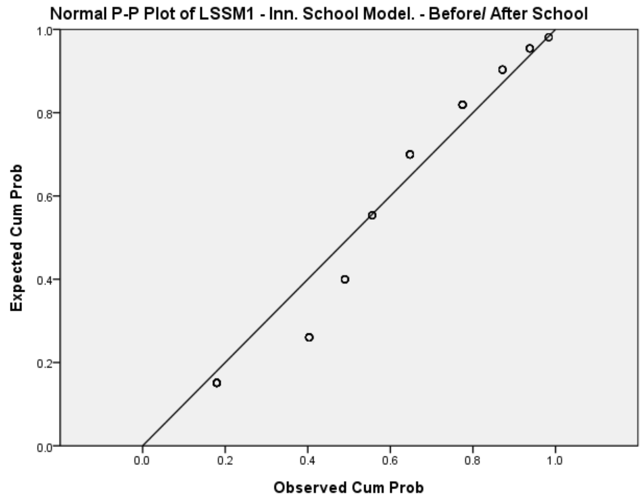

Figure 146 **P-P Plot LSSM1**

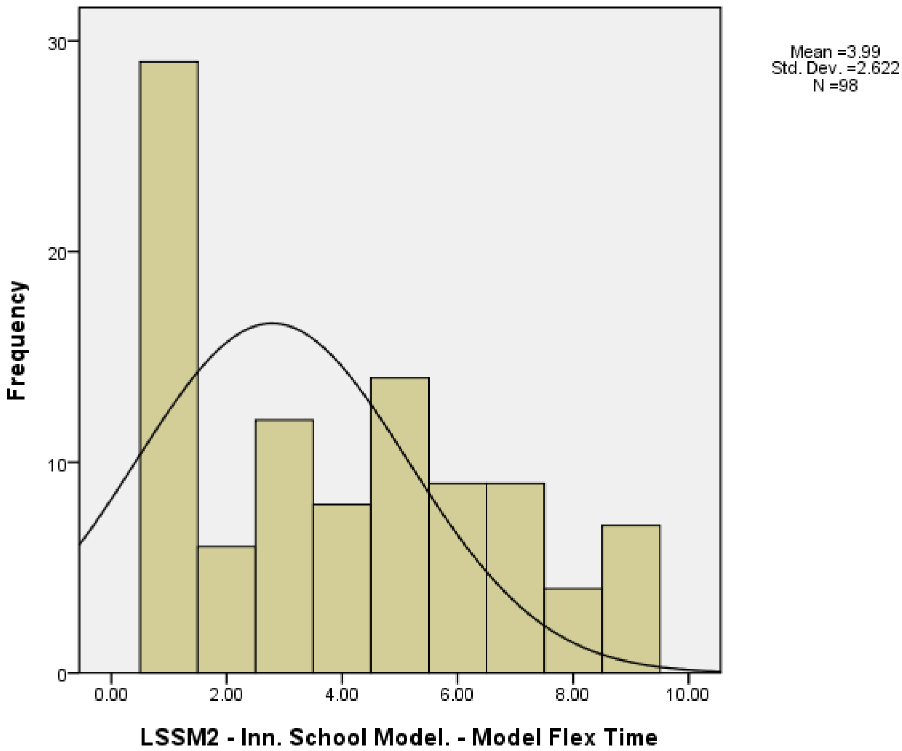

Figure 147 **Histogram LSSM2**

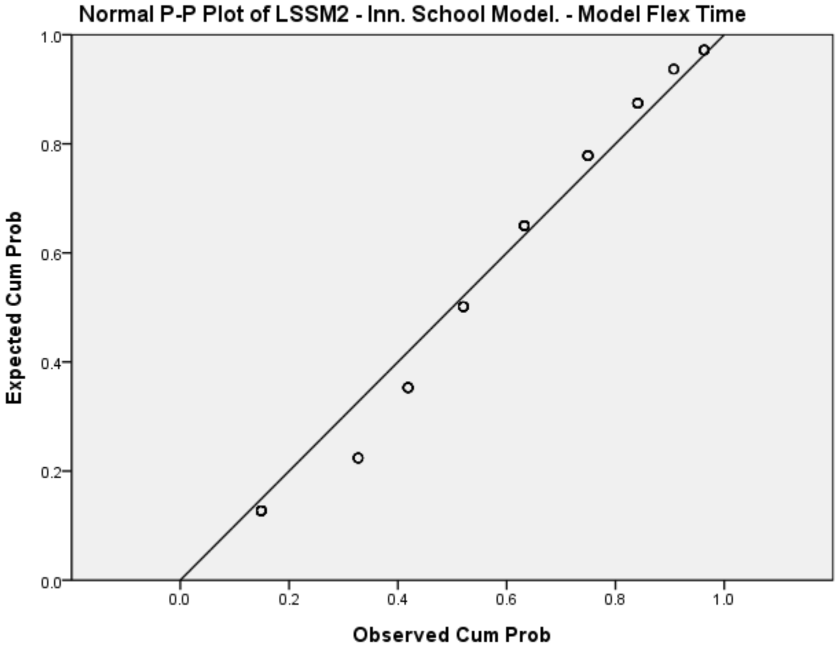

Figure 148 **P-P PlotLSSM2**

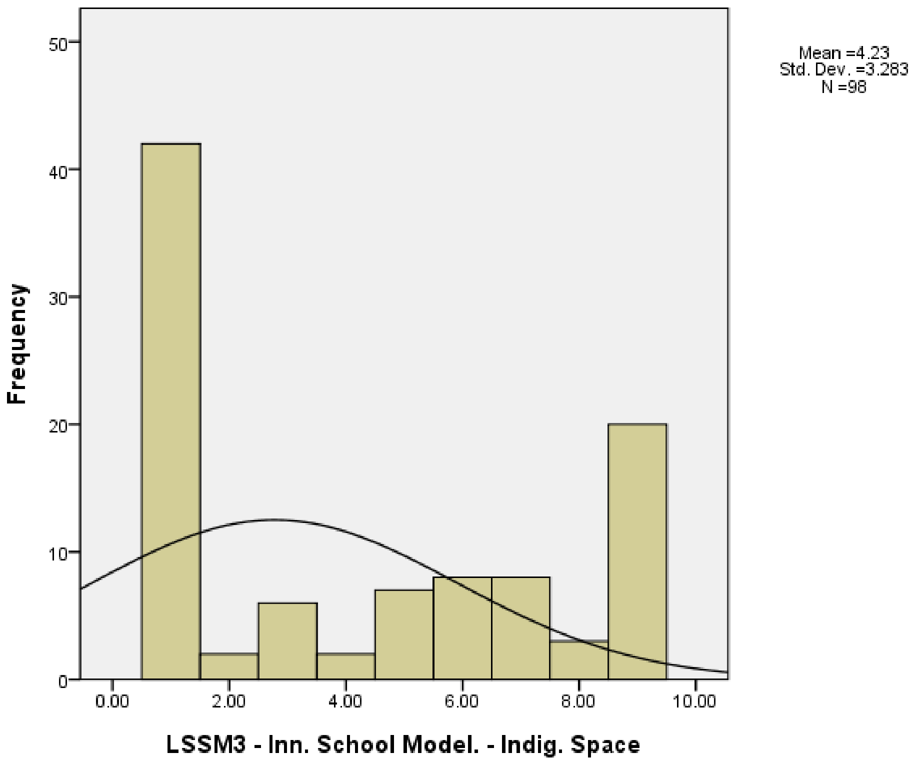

Figure 149 **Histogram LSSM3**

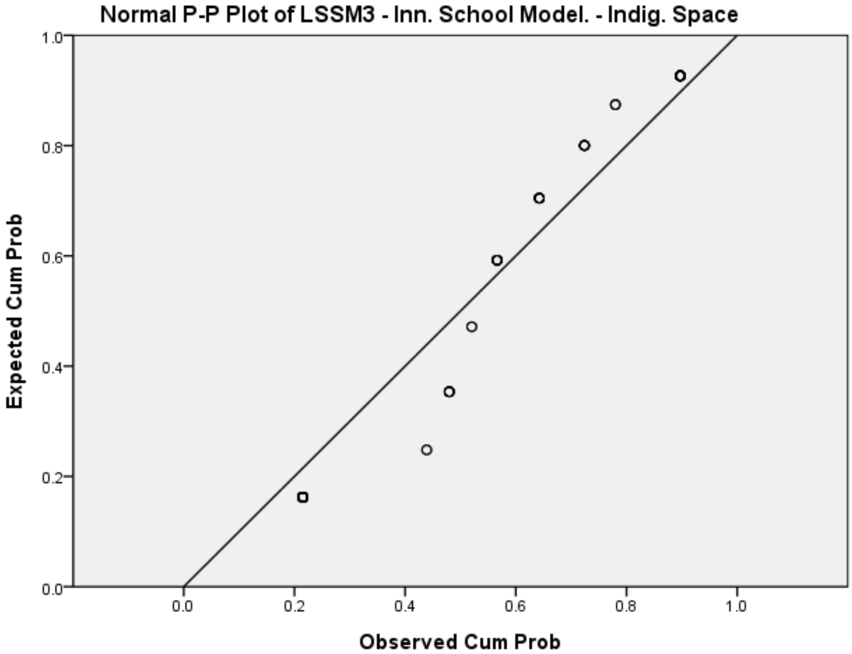

Figure 150 P-P Plot LSSM3

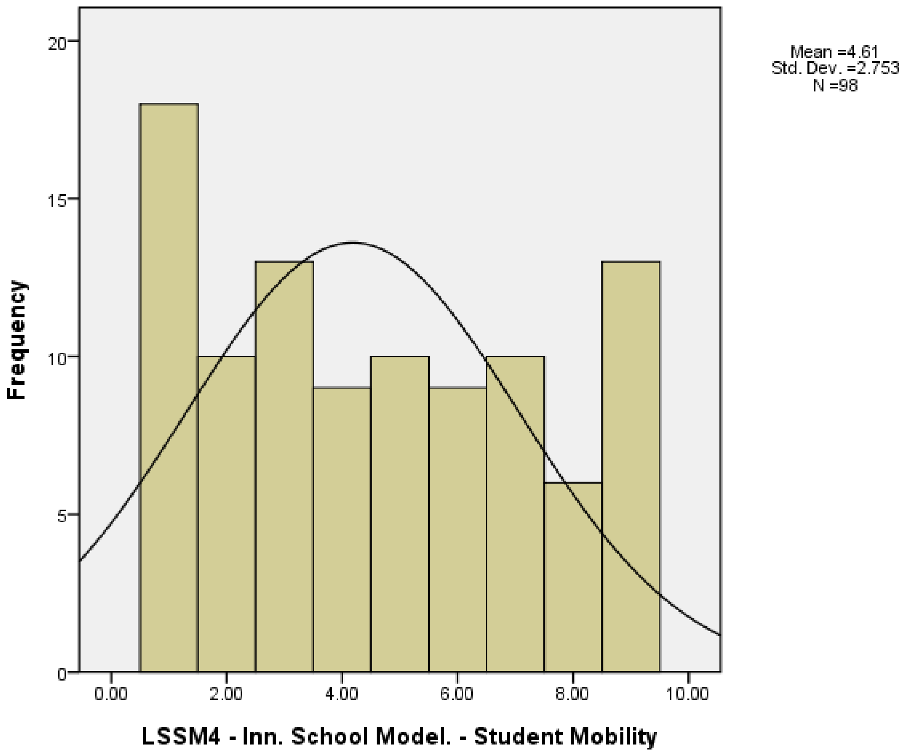

Figure 151 Histogram LSSM4

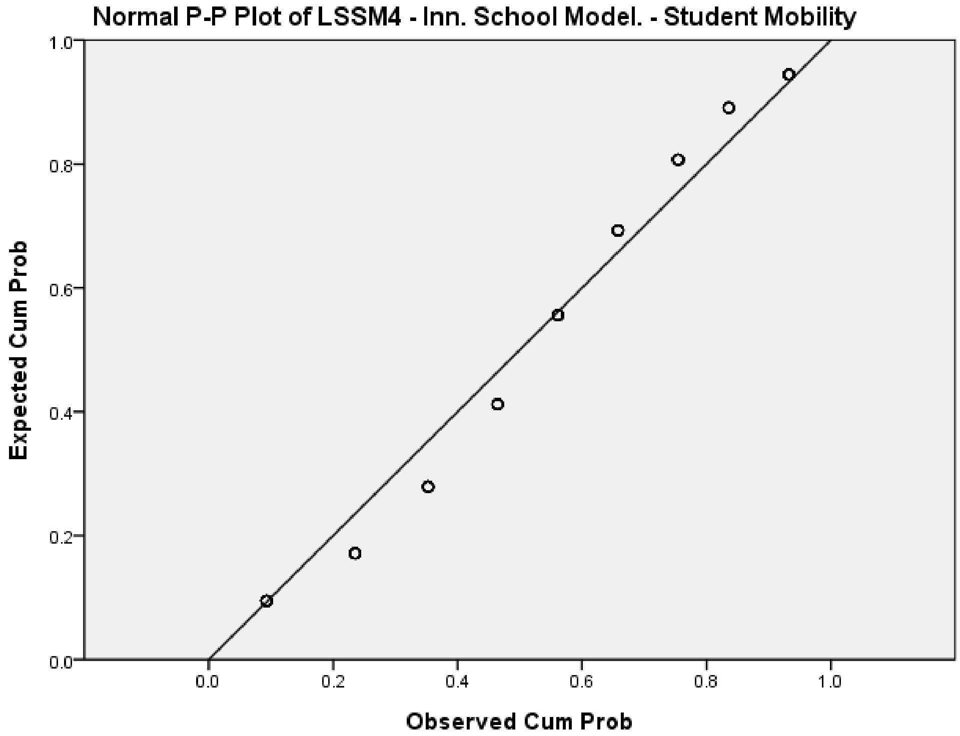

Figure 152 P-P Plot LSSM4

The measurement model

Given the sample used in this analysis is drawn from a constrained population (teachers) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 102).

Table 102 Correlation Matrix

	LSSM1	LSSM2	LSSM3	LSSM4
LSSM1	1.000			
LSSM2	.312	1.000		
LSSM3	.260	.360	1.000	
LSSM4	.211	.440	.470	1.000

The correlation matrix (refer Table 102) shows most variables (except for LSSM1) have a medium to large correlation with at least 2 or 3 other variables and all are significant. This would suggest there may be some basis for applying an EFA.

Table 103 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.698
Bartlett's Test of Sphericity	Approx. Chi-Square	62.103
	df	6
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 62.103 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.698 would suggest there is probably a factor structure underlying the variables (refer Table 103).

Table 104 Communalities

Communalities

	Initial	Extraction
LSSM1	.123	.151
LSSM2	.262	.386
LSSM3	.266	.407
LSSM4	.306	.493

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 104) would indicate a reasonable level of variation (small < 0.3) in the items is being explained the latent factor, with the exception of LSSM1, which was deleted from further analysis. Otherwise, between 39% and 49% of the variance in items is being explained by the underlying factor structure. It was decided to drop LSSM1 from the model, given that a two factor solution with four items would not be viable.

Table 105 **KMO and Bartlett's Test**

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.665
Bartlett's Test of Sphericity	Approx. Chi-Square	49.437
	df	3
	Sig.	.000

On the repeated EFA, Barlett's test value for the correlation matrix is 49.437 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.665 would suggest there is probably a factor structure underlying the variables (refer Table 105).

Table 106 **Total Variance Explained**

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.866	62.215	62.215	1.312	43.745	43.745
2	.617	20.569	82.785			
3	.516	17.215	100.000			

The above table (refer Table 106) shows that only one of the eigenvalues exceed one, as expected for 3 items. Factor 1 is accounting for ~ 62% of the total variance of 3 (3 because we have 8 variables and the variance for each variable has been standardised to 1).

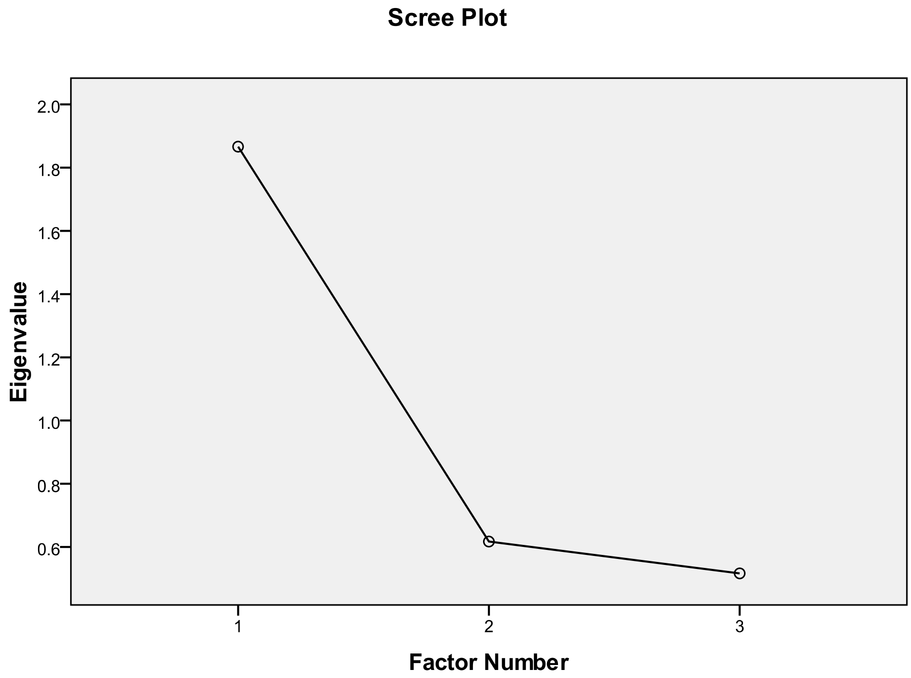

Figure 153 **Scree Plot**

Examination of the scree plot (refer Figure 153) clearly indicates that a one factor solution is appropriate.

Table 107 **Factor Matrix**

Factor Matrix

	Factor
	1
LSSM2	.604
LSSM3	.637
LSSM4	.736

The factor matrix (refer Table 107) indicates a clear 1 factor solution with LSSM2-LSSM4.

Confirmatory factor analysis

A key assumption underlying the use of confirmatory factor analysis is that the observations are drawn from a continuous and multivariate population. A consequence of contravening this assumption ,if maximum likelihood estimation is used, is the chi-square goodness of fit test will not produce an accurate estimate of fit, rejecting true models and parameter estimates will be biased yielding too many significant results (Anderson & Gerbing, 1988). Even if all univariate distributions are normal (which is not the case in this instance) the joint distributions of the variables may depart substantially from multivariate normality. Mardia's coefficient was used as an indicator of degree of multivariate normality (Mardia, 1970).

Table 108 Assessment of normality (Group number 1)

Assessment of normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
LSSM2	.106	9.000	.346	3.423	-1.076	**-5.322**
LSSM3	-5.226	12.777	.239	2.367	-1.426	**-7.052**
LSSM4	-2.222	9.000	.169	1.672	-1.193	**-5.902**
Multivariate					-1.549	**-3.425**

The bolded figures in the table (refer Table 108) indicate variables whose distributions depart significantly from normal either by displaying skewness or kurtosis or both. Mardia's coefficient has a value of -3.425 which suggests a moderate to large deviation from multivariate normality is present in the data.

Table 109 Mahalanobis distance

Observations farthest from the centroid (Mahalanobis distance) (Group number 1)

Observation number	Mahalanobis d-squared	p1	p2
137	11.562	.009	.995
23	10.785	.013	.996
113	10.785	.013	.982
216	10.785	.013	.946
316	10.785	.013	.877
418	10.785	.013	.771
521	10.785	.013	.637
218	10.077	.018	.826
83	9.897	.019	.806
197	9.897	.019	.706
284	9.897	.019	.591
402	9.897	.019	.472
503	9.897	.019	.358
14	9.418	.024	.560
22	9.418	.024	.453
100	9.418	.024	.351
112	9.418	.024	.261
205	9.418	.024	.186
215	9.418	.024	.127
304	9.418	.024	.083
315	9.418	.024	.052
407	9.418	.024	.031
417	9.418	.024	.018
509	9.418	.024	.010
520	9.418	.024	.005
487	8.519	.036	.180
398	8.519	.036	.131
293	8.519	.036	.093
195	8.519	.036	.063
82	8.519	.036	.042
571	7.552	.056	.666

Parameter estimates can also be affected by the presence of outliers. Some top level checks for detecting outliers due to possible errors in data entry have been carried out previously. A table of Mahalanobis distances (refer Table 109) was calculated to assist in detecting outliers due to other causes. Given that none of the cases was indicated to be an extreme outlier, not cases were deleted.

A single factor model of Innovative School Modelling was specified as a latent variable with 3 reflective indicators. It is normal in a congeneric measurement model (refer Figure 154) to set the scale of the latent variable by fixing the variance of the construct to one rather than the usual practice of setting a factor loading to 1. The model with standardised parameters is illustrated below (refer Figure 154).

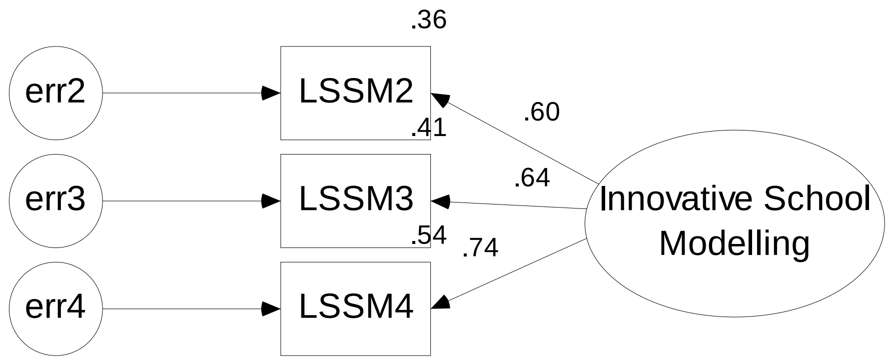

Figure 154 **Measurement Model**

The model converged but fit statistics were not available due to the model being just identified. The factor coefficients ranged from a low of 0.60 to a high of 0.74. All coefficients exceed 0.4 so on this basis all items would be retained if the model was a good fit. It was not possible to obtain tau equivalent and parallel models.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). LSSM2 (.363), LSSM3 (.408), and LSSM4 (.544). LSSM4 is above the “good” cut-off while LSSM2 and LSSM3 are above the acceptable cut off (Fornell & Larcker, 1981). In summary the Innovative School Modelling model is explaining between 36% and 54% of the variance across the individual indicator variables.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell &

Larcker, 1981). The construct reliability for the Innovative School Modelling factor is .70; well above the recommended cut off.

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the factor Innovative School Modelling was .44. In other words the factor Innovative School Modelling is accounting in total for 44% of the variation in the indicator variables which is just below the recommended cut off of 50%.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Innovative School Modelling factor model was .71 which represents a high reliability (Hancock & Mueller) and is in line with previous measures calculated.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were LSSM2 (12.827), LSSM3 (13.417) and LSSM4 (14.881), all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .74, .64 and .60. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

Index score

A scale score for the Innovative School Modelling construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing.

Table 110 Regression Weights

	SM2	SM3	SM4
Raw Regression Weights	0.165	0.148	0.271
Proportional Regression Weights	0.283	0.253	0.464

The scale scores then becomes:

Innovative School Modelling = (LSSM2*.283) + (LSSM3*.253) + (LSSM4*.464)

This approach ensures the estimates of the scale score adjusted for measurement error is proportionally weighted by the actual contribution made by each indicator. The proportional regression weight (refer Table 110) scores sum to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same ‘metric’ as that of indicators for the construct.

Appendix 3.2.4 Leaders Survey Community Engagement

The Items

Leaders Survey Community Engagement Items and descriptives are given in Tables below (refer Table 111).

Table 111 Leaders Survey Community Engagement Item List

Item name	Description
LSCE1	Parents and/ or community members participate in classroom teaching or student learning.
LSCE2	There is a program to encourage parents and/ or community members to become actively involved in the school.
LSCE4	An outreach program is maintained to parents/ families who do not visit the school
LSCE5	Indigenous community members meet regularly with school governance boards (e.g., councils and leadership groups)
LSCE6	Indigenous community members are consulted on major decisions about the direction of the school.
LSCE7	Indigenous community priorities are taken into account as part of the school planning process.
LSCE8	Indigenous community members have a voice in the everyday running of the school.
LSCE9	School staff have significant roles in meetings and events that involve the Indigenous community.

Descriptives:

Table 112 Leaders Survey Descriptive Statistics

Descriptive Statistics

	N	%	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Missing	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
LSCE1	89	28.8%	1.00	9.00	3.2697	.22586	2.13075	.741	.255	-.181	.506
LSCE2	89	28.8%	1.00	9.00	4.7978	.25225	2.37974	.070	.255	-.924	.506
LSCE4	88	29.6%	1.00	9.00	3.5455	.27089	2.54120	.698	.257	-.613	.508
LSCE5	88	29.6%	1.00	9.00	3.4773	.26409	2.47738	.497	.257	-1.153	.508
LSCE6	88	29.6%	1.00	9.00	4.0909	.27364	2.56697	.256	.257	-1.186	.508
LSCE7	88	29.6%	1.00	9.00	4.5682	.27324	2.56320	-.045	.257	-1.295	.508
LSCE8	88	29.6%	1.00	9.00	3.6023	.25223	2.36614	.362	.257	-1.149	.508
LSCE9	89	28.8%	1.00	9.00	4.5281	.28049	2.64614	.188	.255	-1.154	.506
Valid N (listwise)	88										

The minimum and maximum values for each variable lie in the scale range of 1-9 (refer Table 112) respectively indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 3.27 to 4.80 on a 9 point scale. The mean is skewed towards the low end of the scale (about 4) as the mode on all items was a response of “1 – not much”. This has implications for conducting statistical analysis that rely on normal distributions of responses. However standard deviations are around 2.5 suggesting range of response is adequate.

Missing value analysis indicated that 88 out of a total of 125 cases were complete with respect to the item list. The remaining 33 cases are not missing at random. It would appear that these cases did not complete any items in the item list – perhaps due to response fatigue.

The 33 cases were deleted from the response set. One more case indicated missing data for LSCE4 to LSCE8. As more than half of the data was missing, this case was also deleted. There was no further missing data.

Both exploratory and confirmatory factor analysis are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should be normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms and P-P plots (refer Figures below) would indicate some important departures from normality with all variables. This has implications for the estimation techniques used in the confirmatory factor analysis in particular.

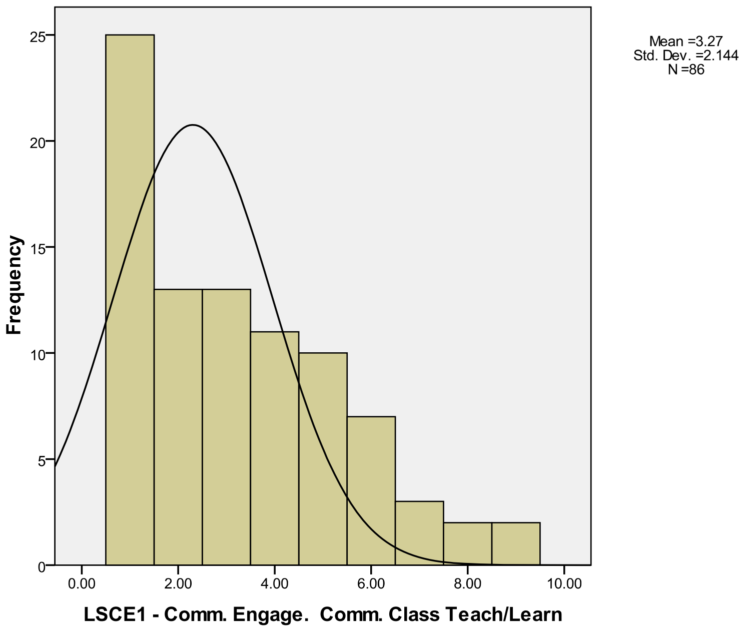

Figure 155 **Histogram LSCE1**

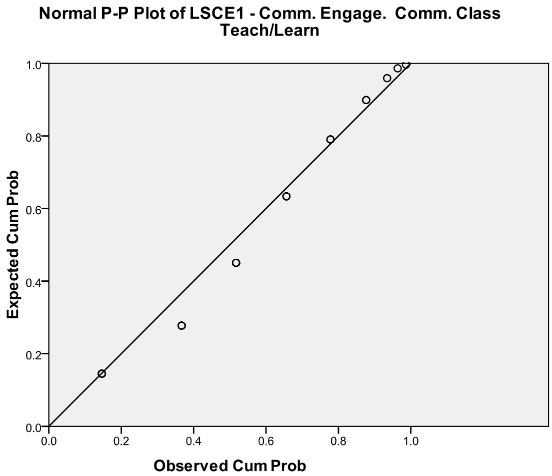

Figure 156 **P-P Plot LSCE1**

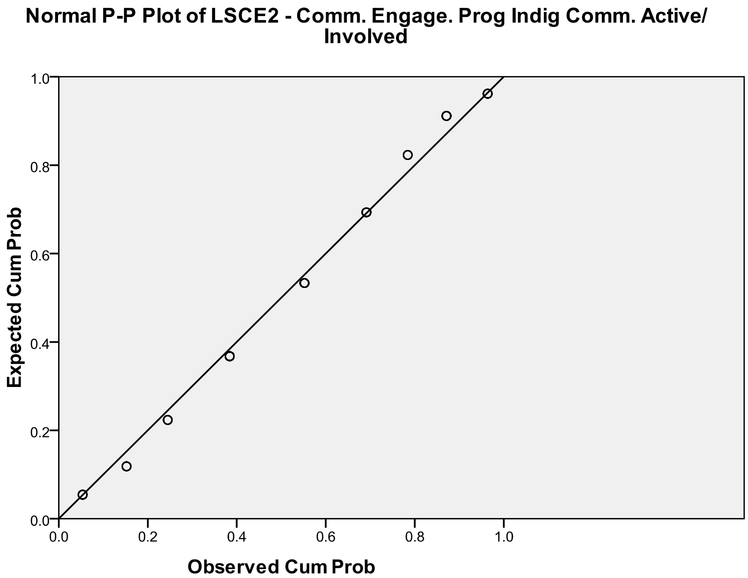

Figure 157 **P-P Plot LSCE2**

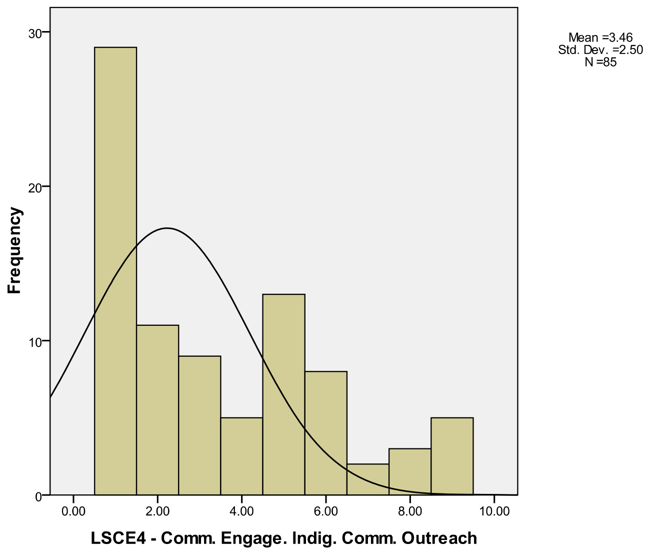

Figure 158 **Histogram LSCE4**

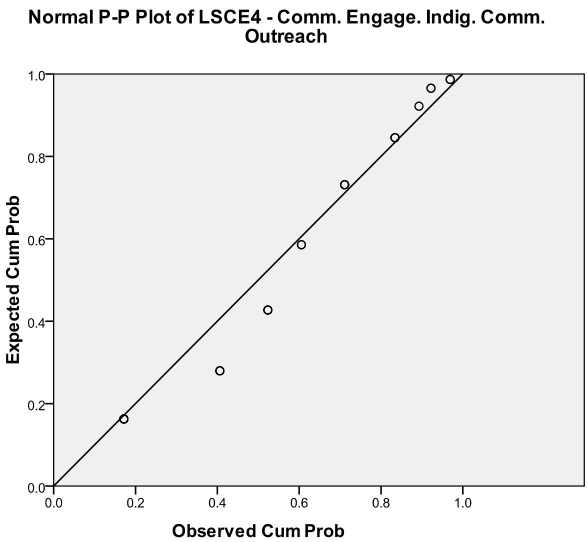

Figure 159 **P-P Plot LSCE4**

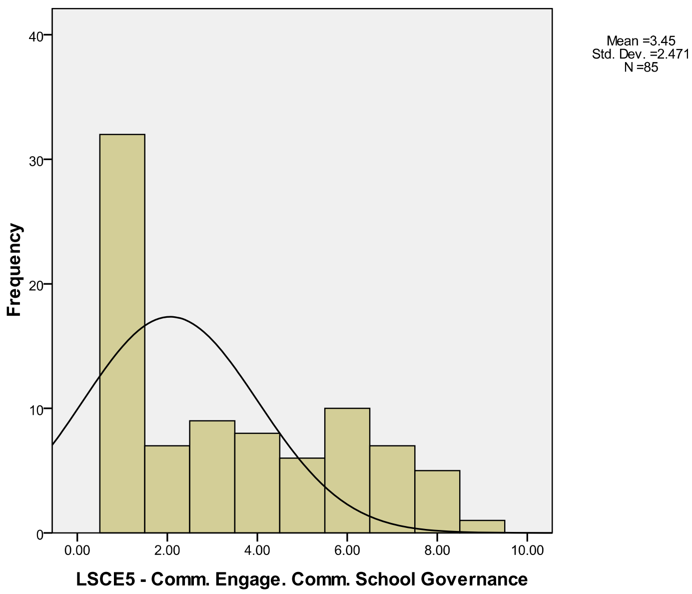

Figure 160 **Histogram LSCE5**

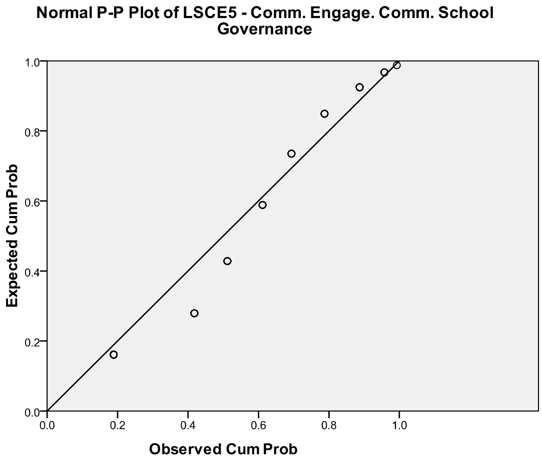

Figure 161 **P-P Plot LSCE5**

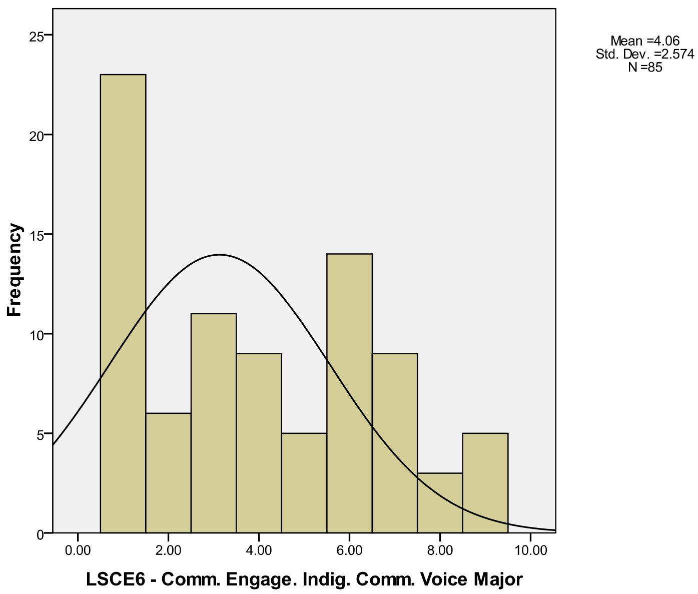

Figure 162 Histogram LSCE6

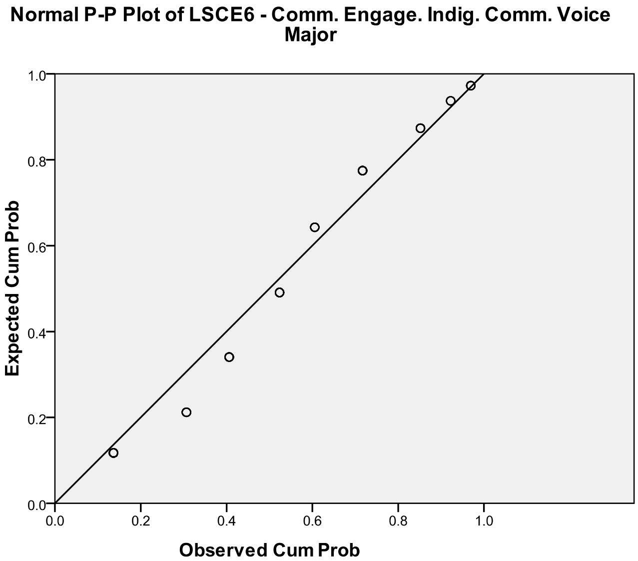

Figure 163 P-P Plot LSCE6

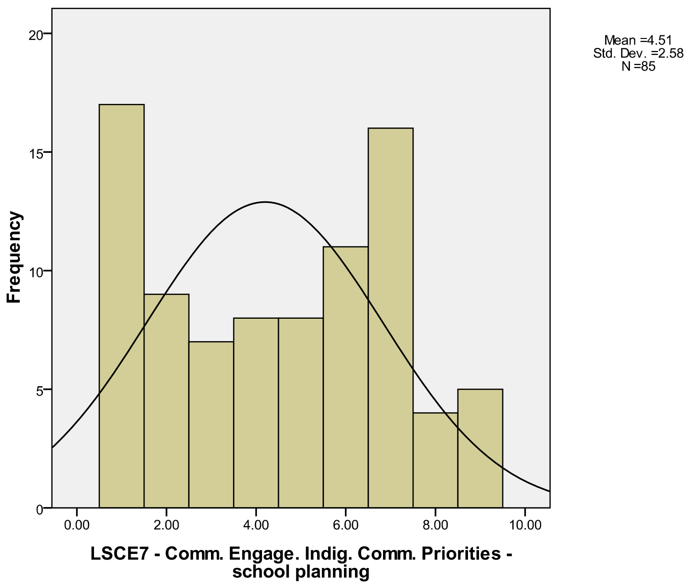

Figure 164 **Histogram LSCE7**

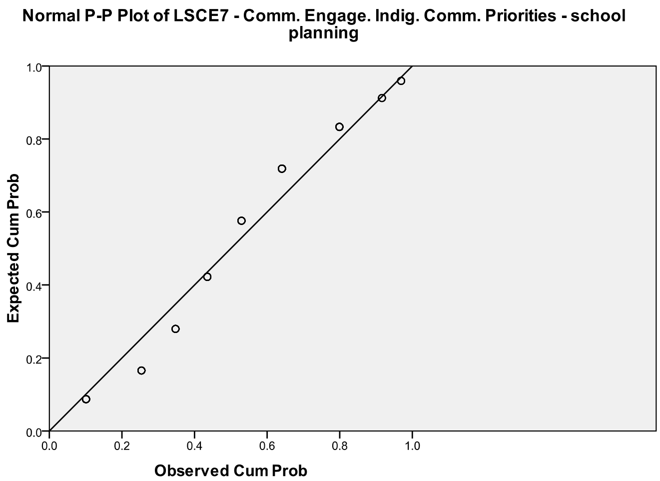

Figure 165 **P-P Plot LSCE7**

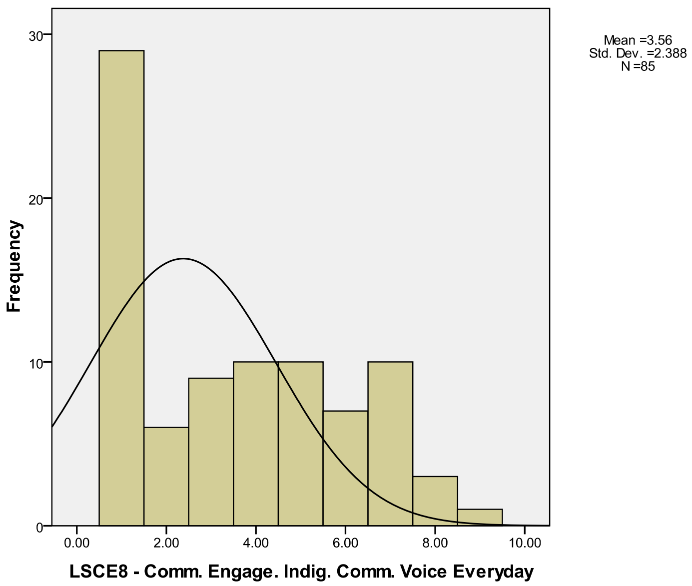

Figure 166 Histogram LSCE8

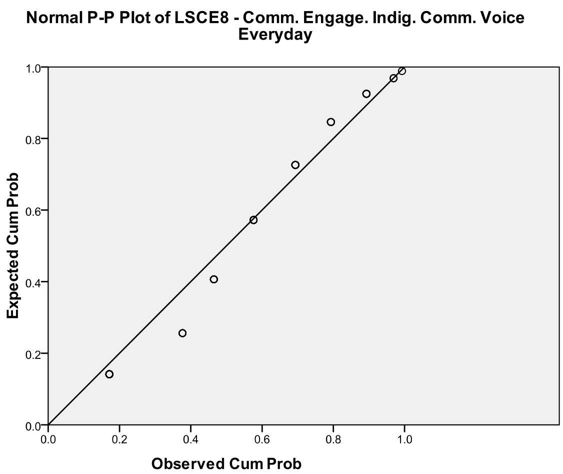

Figure 167 P-P Plot LSCE8

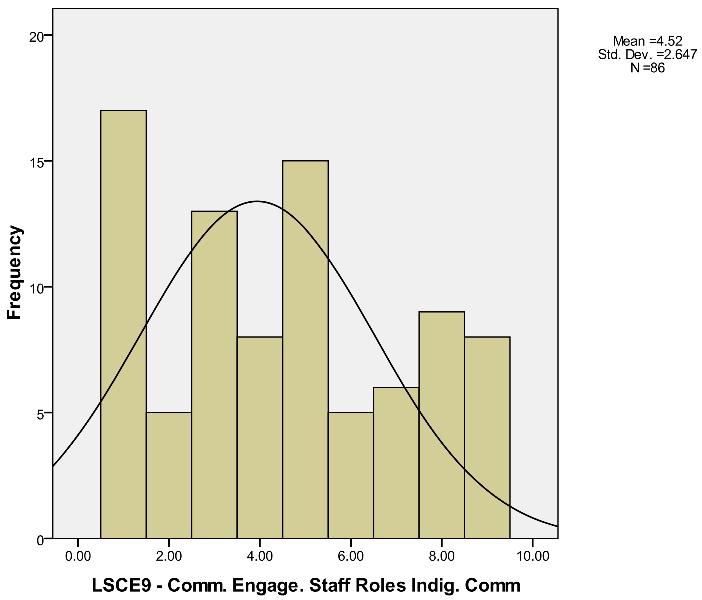

Figure 168 **Histogram LSCE9**

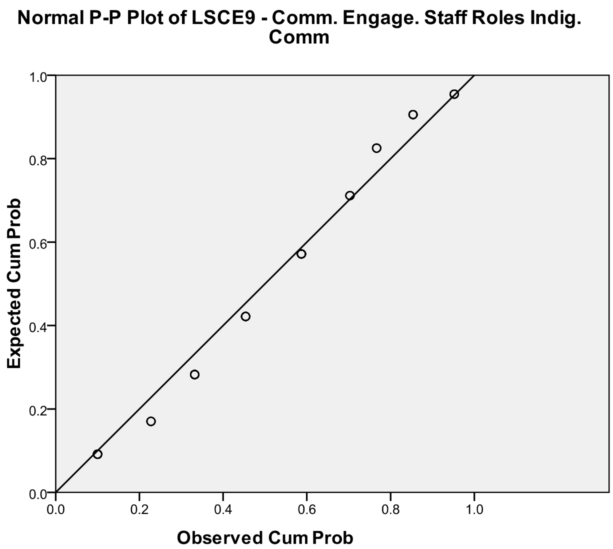

Figure 169 **P-P Plot LSCE9**

The measurement model

Given the sample used in this analysis is drawn from a constrained population (teachers) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis

As indicated previously much of the data follows a non normal distribution but as the factor analysis is being used in a descriptive way to summarise relationships, assumptions in regards to normal data may be relaxed as long as the deviation is not too large (Tabachnick & Fidell, 2007).

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 113).

Table 113 Correlation matrix

	LSCE1	LSCE2	LSCE4	LSCE5	LSCE6	LSCE7	LSCE8	LSCE9
LSCE1	1							
LSCE2	.589**	1						
LSCE4	.437**	.549**	1					
LSCE5	.412**	.393**	.336**	1				
LSCE6	.294**	.485**	.501**	.669**	1			
LSCE7	.297**	.495**	.534**	.494**	.734**	1		
LSCE8	.237*	.461**	.496**	.512**	.698**	.799**	1	
LSCE9	.108	.414**	.375**	.344**	.550**	.596**	.545**	1

The correlation matrix (refer Table 113) shows the majority of the correlations are greater than 0.4 and most variables have a medium to large correlation with at least 2 or 3 other variables and all are significant. This would suggest there may be some basis for applying an EFA.

Table 114 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.840
Bartlett's Test of Sphericity	Approx. Chi-Square	359.769
	df	28
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 359.769 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.840 would suggest there is probably a factor structure underlying the variables (refer Table 114).

Table 115 **Communalities**

Communalities

	Initial	Extraction
CE1	.464	.999
CE2	.532	.511
CE4	.432	.420
CE5	.515	.424
CE6	.695	.698
CE7	.727	.800
CE8	.680	.749
CE9	.428	.446

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 115) would indicate a reasonable level of variation (small < 0.3) in the items is being explained the latent factor. Specifically between 42% and 99% of the variance in items is being explained by the underlying factor structure. Of concern is the extraction in the case of three items is explaining less variance in an item than the initial model. This suggests that there may be at least one additional factor. Therefore, the analysis was re run using an eigenvalue threshold of 0.7 for factor extraction.

Table 116 **KMO and Bartlett's Test**

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.840
Bartlett's Test of Sphericity	Approx. Chi-Square	359.769
	df	28
	Sig.	.000

Acceptable values for Barlett's test of sphericity (χ^2 = 359.769, p=.000) and Kaiser-Meyer-Olkin (0.840) (refer Table 116) were obtained for the revised EFA.

Table 117 Communalities

Communalities

	Initial	Extraction
LSCE1	.464	.703
LSCE2	.532	.621
LSCE4	.432	.487
LSCE5	.515	.999
LSCE6	.695	.729
LSCE7	.727	.827
LSCE8	.680	.751
LSCE9	.428	.442

Communalities (refer Table 117) for all items are greater than 0.3 upon extraction, and improved upon from the initial model. This demonstrates a great improvement on the first EFA.

Table 118 Total Variance Explained

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.715	52.391	52.391	4.300	47.779	47.779	2.008	22.316	22.316
2	.934	10.383	62.774	.463	5.147	52.926	1.784	19.826	42.143
3	.828	9.199	71.972	.482	5.353	58.279	1.452	16.136	58.279
4	.687	7.638	79.610						
5	.583	6.477	86.087						
6	.361	4.015	90.102						
7	.340	3.783	93.885						
8	.324	3.596	97.481						
9	.227	2.519	100.000						

The above table (refer Table 118) shows that two of the eigenvalues exceeds one – as a result 2 factors will be extracted. Factor 1 is accounting for ~ 52% of the total variance of 8 (8 because we have 9 variables and the variance for each variable has been standardised to 1). Factor 2 explains a further 10% of the variance of 8; and factor 3 another 9%.

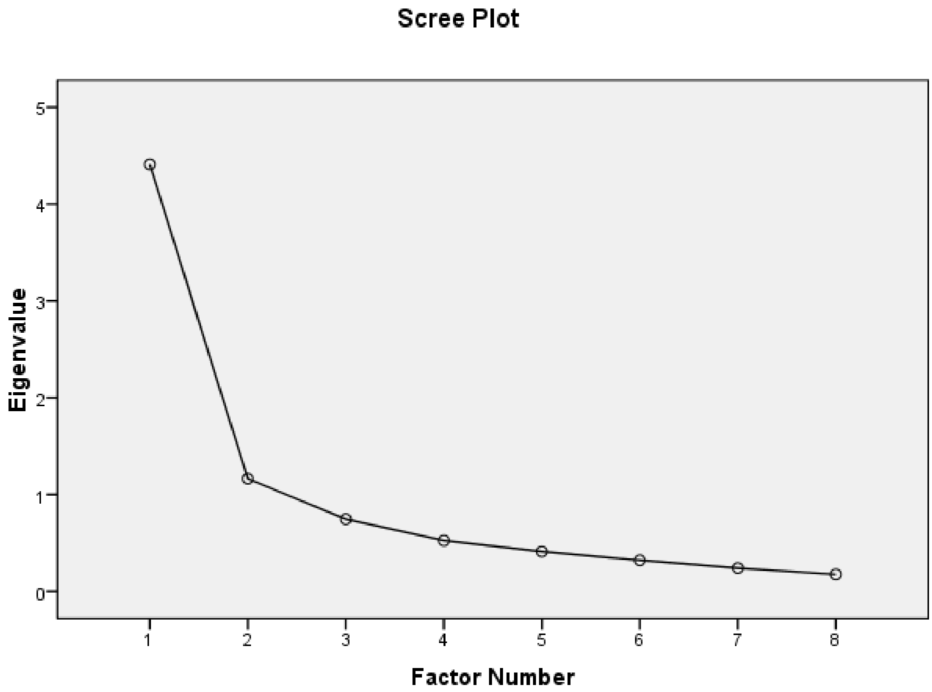

Figure 170 **Scree Plot**

Examination of the scree plot (refer Figure 170) would indicate a two factor solution is appropriate.

The variance explained by the factor solution is now in most cases more than that explained by the initial solution - a definite improvement.

Table 119 **Factor Matrix**

Factor Matrix

	Factor		
	1	2	3
LSCE5	.999		
LSCE6	.673	.513	-.116
LSCE7	.499	.749	-.128
LSCE8	.516	.674	-.175
LSCE4	.340	.548	.267
LSCE9	.348	.544	-.158
LSCE2	.397	.505	.457
LSCE1	.414	.216	.697

The factor matrix (refer Table 119) gives the factor loadings for each item on the underlying constructs. It is clear all items load well on at least one factor.

The χ^2 test for goodness of fit (refer Table 120) is not significant, which suggests that the model is a good fit to the data.

Table 120 **Goodness-of-fit Test**

Goodness-of-fit Test

Chi-Square	df	Sig.
6.166	7	.521

The factor matrix (refer Table 119) gives the factor loadings for each item on the underlying constructs. Conceptually, the first factor relates to Indigenous leadership roles within the school, while the second factor relates to Indigenous influence on teaching activities. The third factor does not really add to the model given that LSIL1 and LSIL6 are cross loading. LSIL7 does not load onto any factor. This EFA suggests a 2 factor model for Indigenous leadership containing the items LSIL5, LSIL8, LSIL4 and LSIL6 on one factor and LSIL1, LSIL2 and LSIL3 on the other factor.

Table 121 **Rotated Factor Matrix**

Rotated Factor Matrix

	Factor		
	1	2	3
LSCE7	.855	.257	.175
LSCE8	.814	.194	.225
LSCE6	.703	.234	.425
LSCE9	.642	.124	.121
LSCE1		.809	.216
LSCE2	.377	.682	.113
LSCE4	.472	.510	
LSCE5	.316	.249	.915

The rotated factor matrix (refer Table 121) indicates a 2 factor solution with LSCE1 – LSCE2 loading on factor 1 and TSCE4 – TSCE9 loading on factor 2. TSCE2 and TSCE4 is cross loading on both factors. However, given that CE1-CE4 related to family/ community strategies, there is substantive justification to form a construct of these three items. LSCE5 represents a single item loading onto a third factor.

A key assumption underlying the use of confirmatory factor analysis is that the observations are drawn from a continuous and multivariate population. A consequence of contravening this assumption ,if maximum likelihood estimation is used, is the chi-square goodness of fit test will not produce an accurate estimate of fit, rejecting true models and parameter estimates will be biased yielding too many significant results (Anderson & Gerbing, 1988). Even if all univariate distributions are normal (which is not the case in this instance) the joint distributions of the variables may depart substantially from multivariate normality. Mardia's coefficient was used as an indicator of degree of multivariate normality (Mardia, 1970).

Table 122 **Assessment of normality (Group number 1)**

Assessment of normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
LSCE9	1.000	9.000	.185	.712	-1.157	-2.228
LSCE8	1.000	9.000	.343	1.322	-1.145	-2.205
LSCE7	1.000	9.000	-.058	-.224	-1.276	-2.458
LSCE6	1.000	9.000	.241	.928	-1.175	-2.262
LSCE4	1.000	9.000	.675	2.600	-.641	-1.234
LSCE2	1.000	9.000	.069	.265	-.940	-1.810
LSCE1	1.000	9.000	.729	2.807	-.238	-.458
Multivariate					11.635	4.889

The bolded figures in the table (refer Table 122) indicate variables whose distributions depart significantly from normal either by displaying skewness or kurtosis or both. Mardia's coefficient has a value of 11.489 which suggests a moderate deviation from multivariate normality is present in the data.

Given the data is not multivariate normally distributed it is inappropriate to use estimation techniques that rely on this assumption for the reasons already outlined. While there are several alternatives to remedy this situation a decision was made to use the Bollen-Stine bootstrap as the appropriate solution for testing goodness of fit of the model while correcting for non normally distributed data.

Mahalanobis distance

Observations farthest from the centroid (Mahalanobis distance) (Group number 1)

Table 123 **Mahalanobis Distance**

number	Mahalanobis d-squared	p1	p2
89	20.319	.005	.355
88	18.847	.009	.181
26	18.820	.009	.044
86	18.787	.009	.008
32	17.201	.016	.015
23	16.974	.018	.005
21	16.911	.018	.001
35	16.880	.018	.000
55	16.864	.018	.000
74	16.514	.021	.000
15	15.451	.031	.000
59	13.508	.061	.008

Parameter estimates can also be affected by the presence of outliers. Some top level checks for detecting outliers due to possible errors in data entry have been carried out previously. A table of Mahalanobis distances (refer Table 123) was calculated to assist in detecting outliers due to other causes. The figures in the table indicate cases 89 and 88 are furthest from the centre of the distribution. However the drop in distance to the next observation (case 26) is not large so it is unlikely these cases could be considered outliers.

Confirmatory factor analysis

Factor one was mapped by the following items in the EFA.

Table 124 **School Community Engagement**

	School Community Engagement
LSCE1	Parents and/ or community members participate in classroom teaching or student learning.
LSCE2	There is a program to encourage parents and/ or community members to become actively involved in the school.
LSCE4	An outreach program is maintained to parents/ families who do not visit the school.

Factor two was mapped by the following items in the EFA.

Table 125 **School Governance and Community Engagement**

	School Governance and Community Engagement
LSCE6	Indigenous community members are consulted on major decisions about the direction of the school.
LSCE7	Indigenous community priorities are taken into account as part of the school planning process.
LSCE8	Indigenous community members have a voice in the everyday running of the school.
LSCE9	School staff have significant roles in meetings and events that involve the Indigenous community..

LSCE2 and LSCE4 (refer Tables above) cross loaded almost equally on both factor 1 and factor 2. These item have initially been included in factor 1 based on substantiative grounds.

A two factor measurement model was constructed and tested for fit using the Bollen-Stine bootstrap as the estimation engine. A two factor model of Community Engagement was specified as a latent variable with 3 and 4 reflective indicators. It is normal in a congeneric measurement model (refer Figure 171) to set the scale of the latent variable by fixing the variance of the construct to one rather than the usual practice of setting a factor loading to 1. However when boot strapping is applied this may result in incorrect standard errors being generated. Consequently the factor loading of the LSCE1 and LSCE6 (refer Tables above) item was set to one to scale the latent variables. The model with standardised parameters is illustrated below.

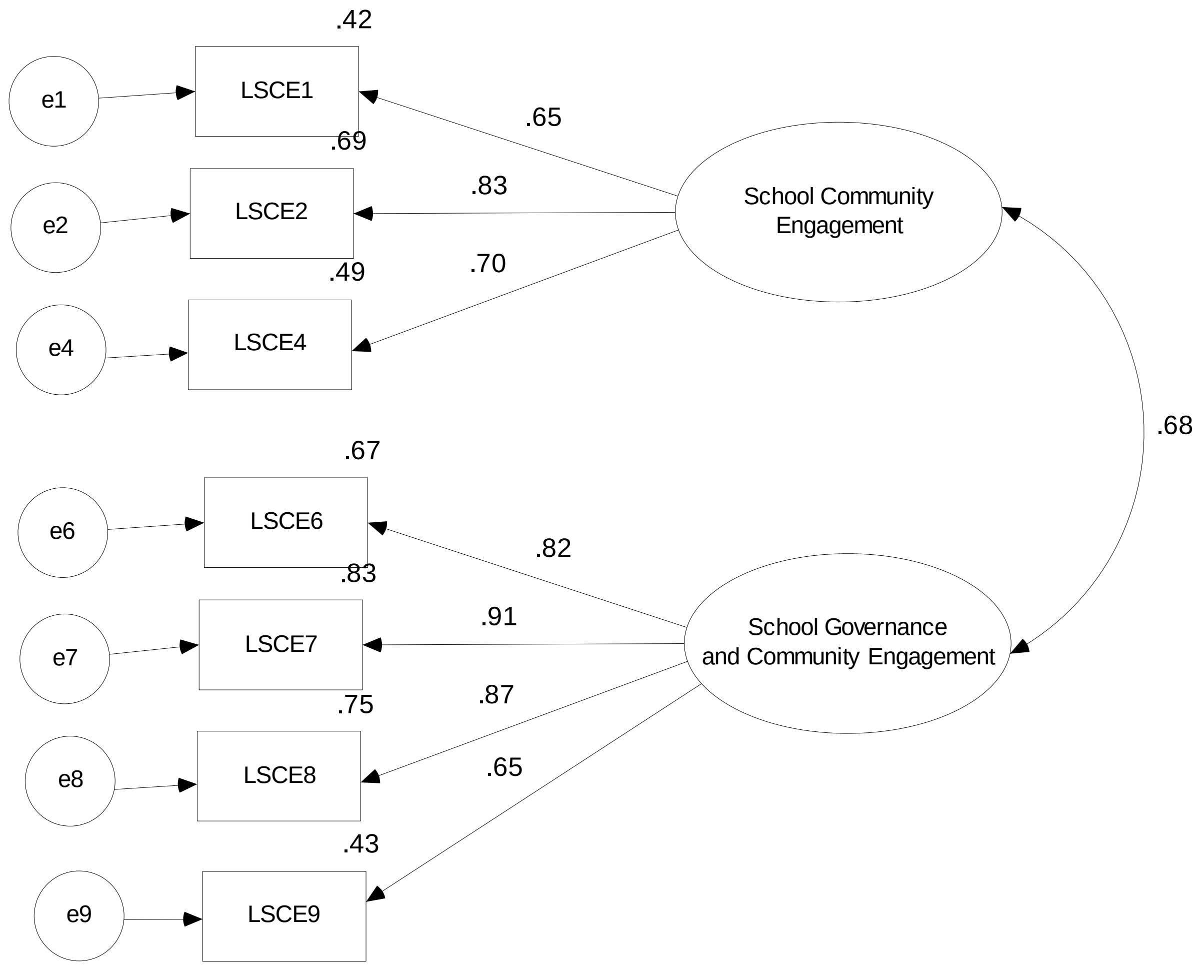

Figure 171 **Measurement Model**

The model (refer Figure 171) converged and fit the data Bollen-Stine bootstrap p = 0.368, RMSEA = .068 (.000, .134), GFI = .947, TLI = .973 and CFI = .983. The factor coefficients ranged from a low of 0.65 to a high of 0.91. All coefficients exceed 0.4 so on this basis all items would be retained if the model was a good fit.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case the parallel model (Bollen-Stine bootstrap p = 0.000) did not fit the data well and the tau model (Bollen-Stine bootstrap p = 0.154) did fit the data but not as well as the congeneric model so that model was retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). The SMCs for the indicator variables mapped by the Community Engagement model were LSCE1 (.423), LSCE2 (.695), LSCE4 (.494), LSCE6 (.667), LSCE7 (.832), LSCE8 (.752) and LSCE9 (.428). In summary the Community Engagement model is explaining between 42% and 83% of the variance across the individual indicator variables. LSCE2, LSCE6, LSCE7, and LSCE8 are above the "good" cut-off while LSCE1, LSCE4, and LSCE9 are above the acceptable cut off (Fornell & Larcker, 1981).

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the Community Engagement model was .53 for School Community Engagement and .67 for School Governance and Community Engagement. In other words the factors are accounting for 53% and 67%of the variation in their respective indicator variables which is above the recommended cut off of 50%.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for the Community Engagement model is .77 for School Community Engagement and .89 for School Governance and Community Engagement; well above the recommended cut off.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Community Engagement model was .80 for School Community Engagement and .92 for School Governance and Community Engagement which represents a high reliability.

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The Community Engagement model fitted well as confirmed by the non significant Bollen-Stine bootstrap p supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were LSCE1 (6.219), LSCE2 (8.408), LSCE4 (6.836), LSCE6 (9.095), LSCE7 (10.808), LSCE8 (9.971) and LSCE9 (6.680) all of which are significant at the .05 level which support a claim for convergent validity.

Index Score

A scale score for the factor 1 construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing (refer Tables below).

Table 126 School Community Engagement Regression Weights

School Community Engagement	CE1	CE2	CE4	CE6	CE7	CE8	CE9
Raw Regression Weights	0.128	0.277	0.133	0.024	0.052	0.037	0.011
Proportional Regression Weights	0.193	0.418	0.201	0.036	0.079	0.056	0.017

Table 127 School Governance and Community Engagement Regression Weights

School Governance and Community Engagement	CE1	CE2	CE4	CE6	CE7	CE8	CE9
Raw Regression Weights	0.020	0.042	0.020	0.162	0.360	0.251	0.073
Proportional Regression Weights	0.022	0.045	0.021	0.175	0.388	0.270	0.079

The scale scores then become:

School Community Engagement = (LSCE1*.194) + (LSCE2*.419) + (LSCE4*.200) + (LSCE6*.035) + (LSCE7*.079) + (LSCE8*.056) + (LSCE9*.017)

School Governance and Community Engagement = (LSCE1*.020) + (LSCE2*.045) + (LSCE4*.022) + (LSCE6*.175) + (LSCE7*.388) + (LSCE8*.271) + (LSCE9*.078)

This approach ensures the estimates of the scale score adjusted for measurement error is proportionally weighted by the actual contribution made by each indicator. The proportional regression weight scores sum to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same ‘metric’ as that of indicators for the construct.

Appendix 3.2.5 Sustainability Measurement Model

Table 128 Sustainability measurement model

The Items

LSSU1	The school will have difficulty maintaining its direction and priorities in Indigenous education if a key staff member left.
LSSU2	The school has a plan in place to ensure continuation in its Indigenous education programs.
LSSU3	The shortage of Indigenous staff is a challenge to continued participation in leadership roles.
LSSU4	Staff turnover is a challenge to sustainability of Indigenous education priorities in this school.
LSSU5	Timely access to professional development for school staff in relation to Indigenous education is a challenge to the sustainability of our programs.
LSSU6	Teachers' lack of awareness of Indigenous education to maintain and improve current initiatives is an issue in this school.
LSSU7	There is a shortage of teachers committed to Indigenous education to maintain and improve current initiatives in this school.
LSSU8	Teachers at this school have a limited capacity to maintain and improve current Indigenous education initiatives in this school.
LSSU9	Staff in this school experience competing demands on their time that impact on the sustainability of Indigenous education initiatives.
LSSU10	The school's difficulty in ensuring the ongoing engagement of members of the Indigenous community is a challenge to program sustainability.
LSSU11	There are insufficient resources to ensure sustainability of Indigenous education programs in your school.

Descriptives:

Table 129 **Descriptive Statistics**

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
LSSS1	89	1.00	9.00	4.2022	.28993	2.73521	.332	.255	-1.072	.506
LSSS2	88	1.00	9.00	5.6023	.25736	2.41423	-.387	.257	-.632	.508
LSSS3	87	1.00	9.00	6.5632	.30311	2.82720	-.913	.258	-.545	.511
LSSS4	88	1.00	9.00	3.8977	.31920	2.99440	.485	.257	-1.348	.508
LSSS5	89	1.00	9.00	4.7079	.29257	2.76011	.136	.255	-1.227	.506
LSSS6	89	1.00	8.00	4.1798	.23353	2.20311	.066	.255	-.966	.506
LSSS7	89	1.00	9.00	3.7191	.25417	2.39786	.441	.255	-1.004	.506
LSSS8	88	1.00	9.00	3.7727	.23518	2.20619	.328	.257	-.783	.508
LSSS9	89	1.00	9.00	5.7079	.28236	2.66374	-.398	.255	-1.000	.506
LSSS10	88	1.00	9.00	5.7841	.28843	2.70567	-.386	.257	-1.116	.508
LSSS11	89	1.00	9.00	4.5169	.28946	2.73077	.103	.255	-1.337	.506

The minimum and maximum values for each variable lie in the scale range of 1-9 (refer Tables above) respectively indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 3.71 to 6.56 on a 9 point scale. The mean is skewed towards the low end of the scale as the mode on all items was a response of "1 – not much". This has implications for conducting statistical analysis that rely on normal distributions of responses. However standard deviations are around 2. 5 suggesting range of response is adequate.

Missing value analysis indicated that 85 out of a total of 116 cases were complete with respect to the item list. A total of 27 of the remaining cases are not missing at random. It would appear that these cases did not complete any items in the item list – perhaps due to response fatigue. These cases were deleted from the response set. The remaining 4 cases had no more than 2 out of 11 items missing from the scale. A decision was made to use maximum likelihood estimation (expectation-maximization EM) to impute likely values for those missing.

Both exploratory and confirmatory factor analysis are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement (refer Table 129).

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should be normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms and P-P plots (refer Figures below) would indicate some important departures from normality with all variables. This has implications for the estimation techniques used in the confirmatory factor analysis in particular.

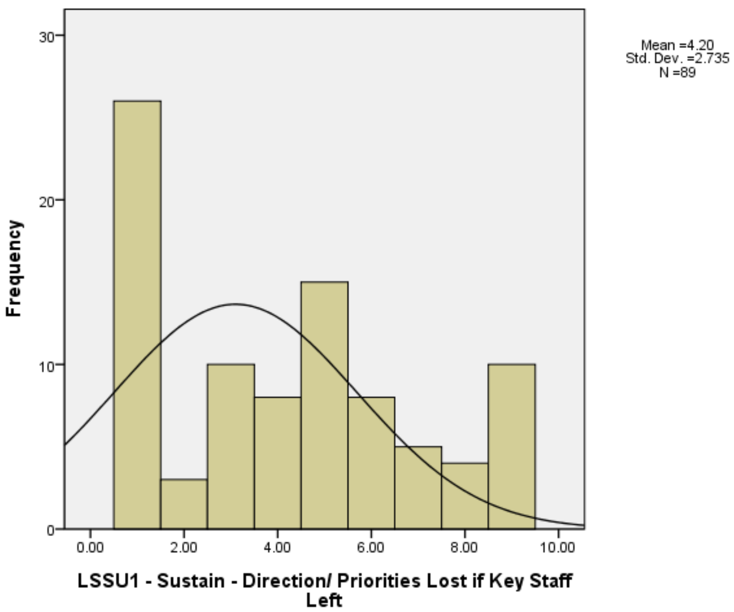

Figure 172 **Histogram LSSU1**

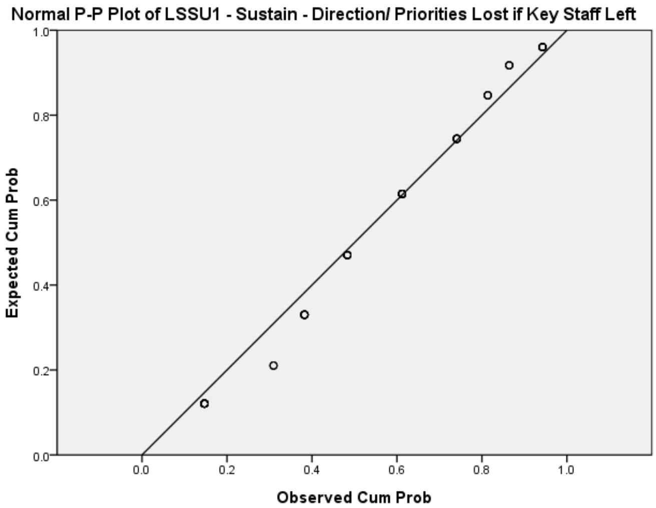

Figure 173 P-P Plot LSSU1

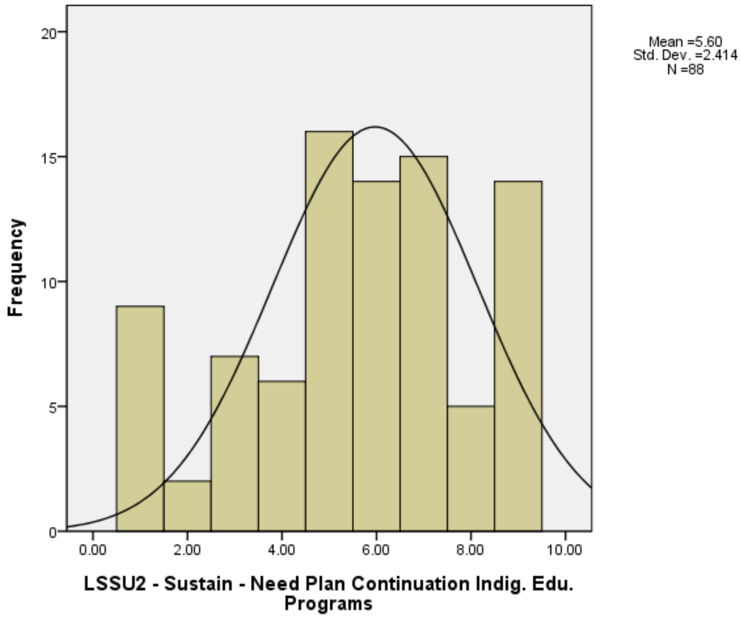

Figure 174 Histogram LSSU2

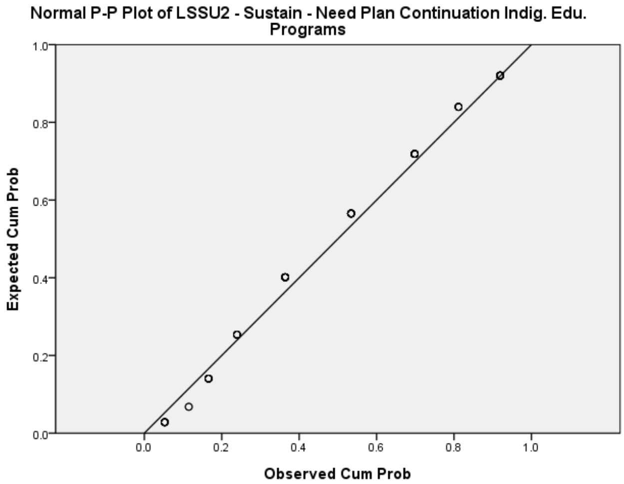

Figure 175 **P-P Plot LSSU2**

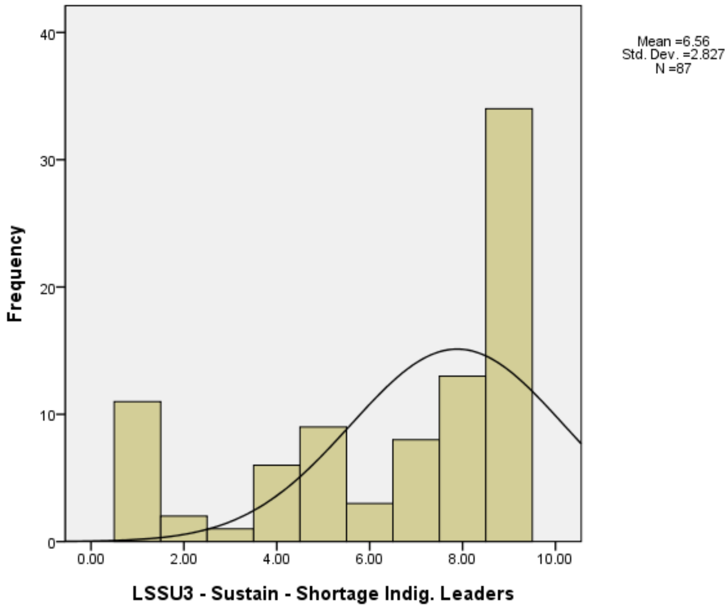

Figure 176 **Histogram LSSU3**

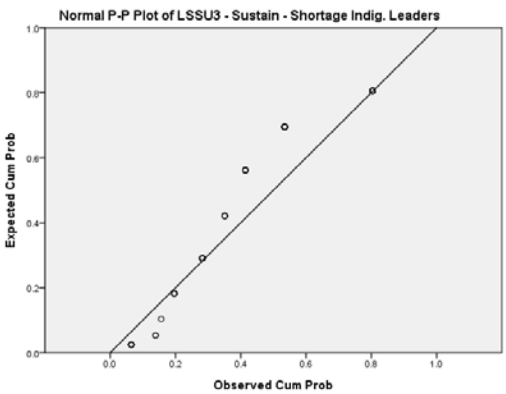

Figure 177 **P-P Plot LSSU3**

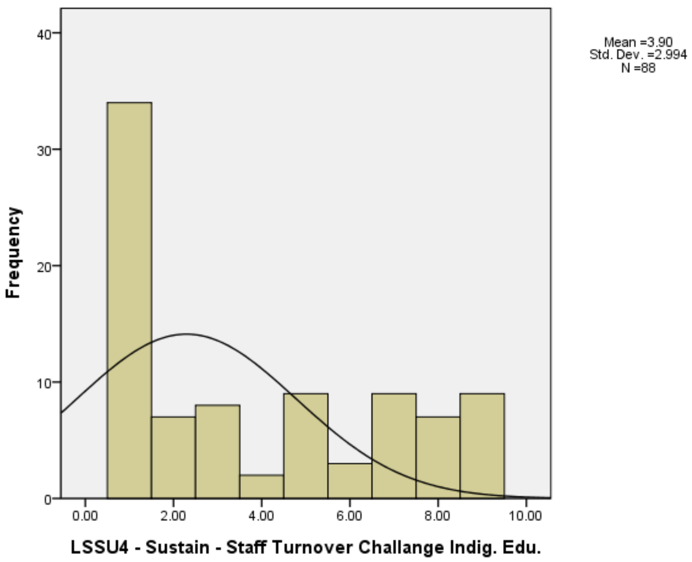

Figure 178 **Histogram LSSU4**

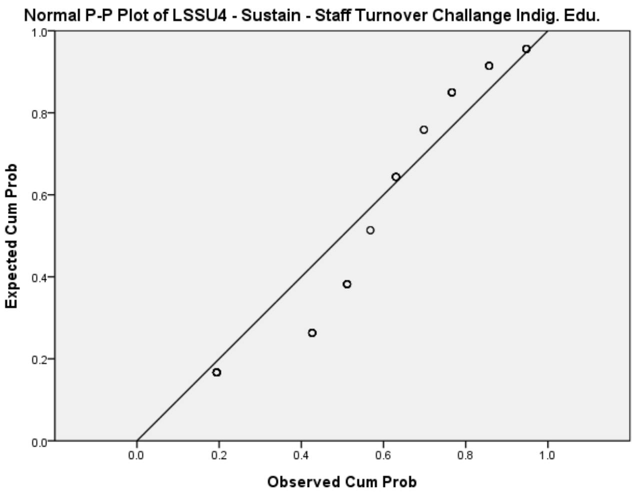

Figure 179 **P-P Plot LSSU4**

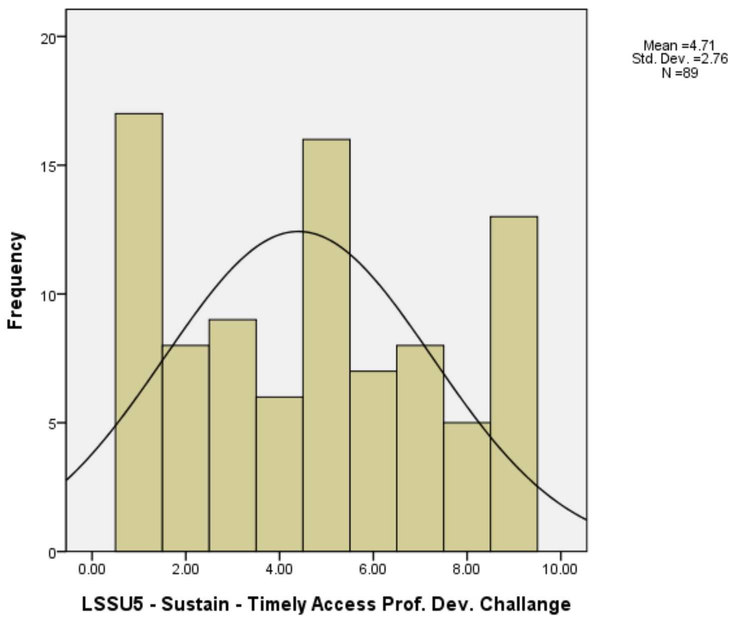

Figure 180 **Histogram LSSU5**

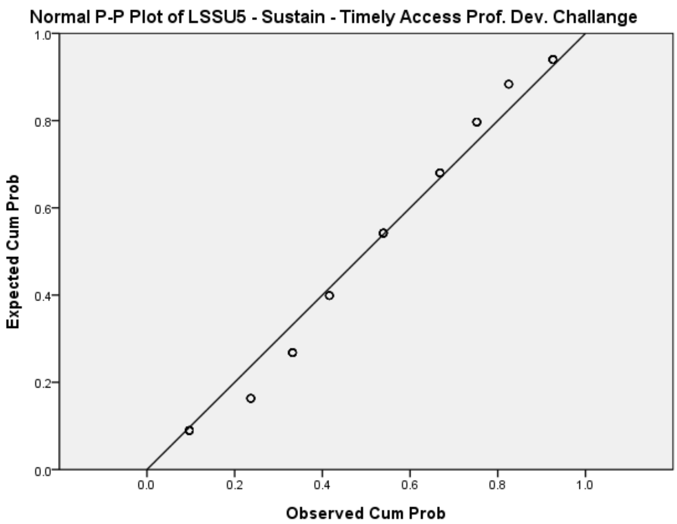

Figure 181 **P-P Plot LSSU5**

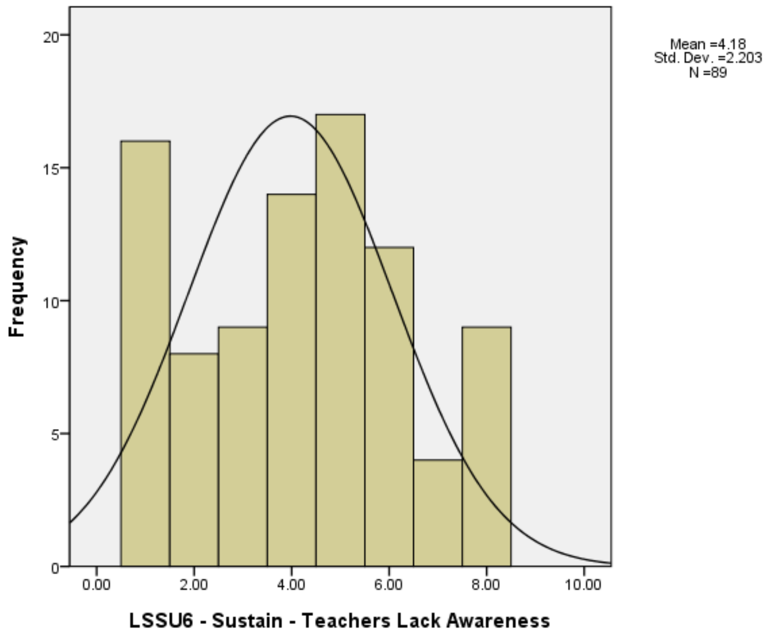

Figure 182 **Histogram LSSU6**

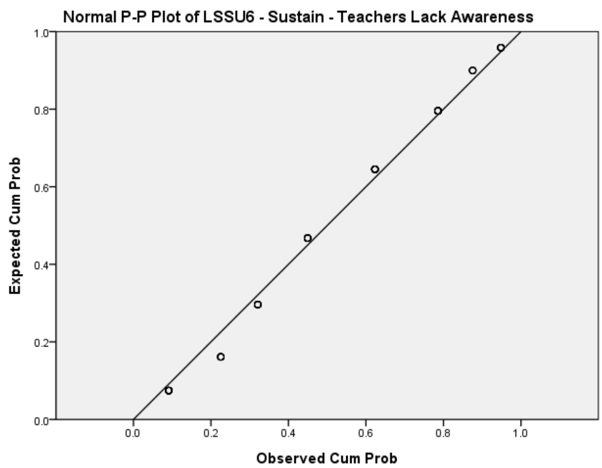

Figure 183 **P-P Plot LSSU6**

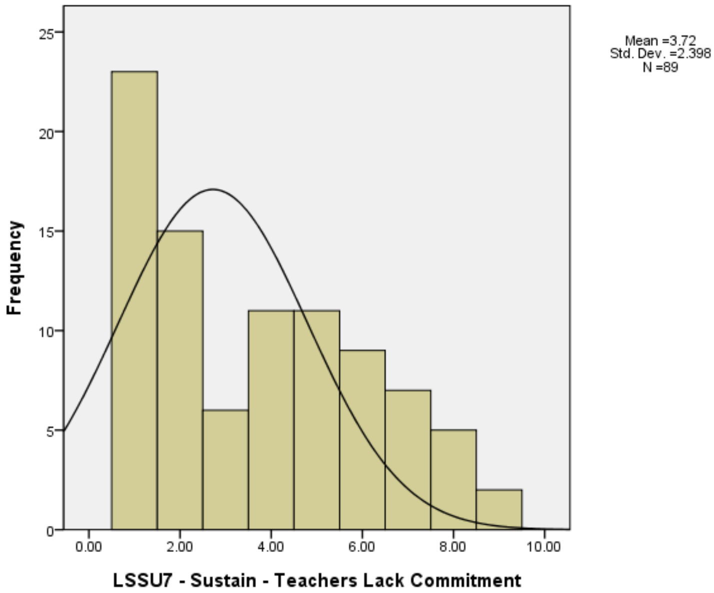

Figure 184 **Histogram LSSU7**

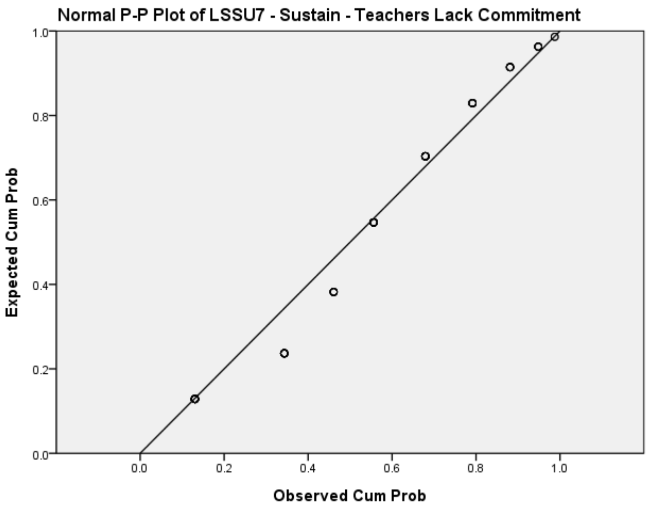

Figure 185 **P-P Plot LSSU7**

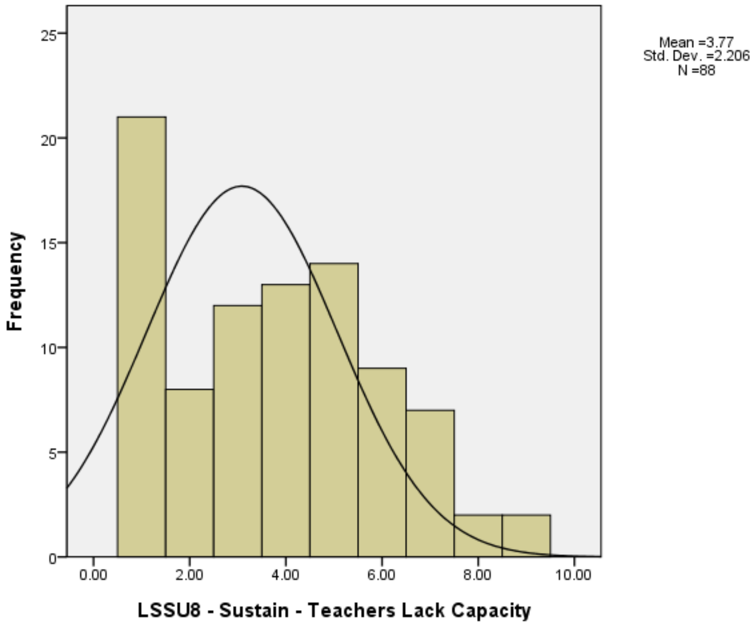

Figure 186 **Histogram LSSU8**

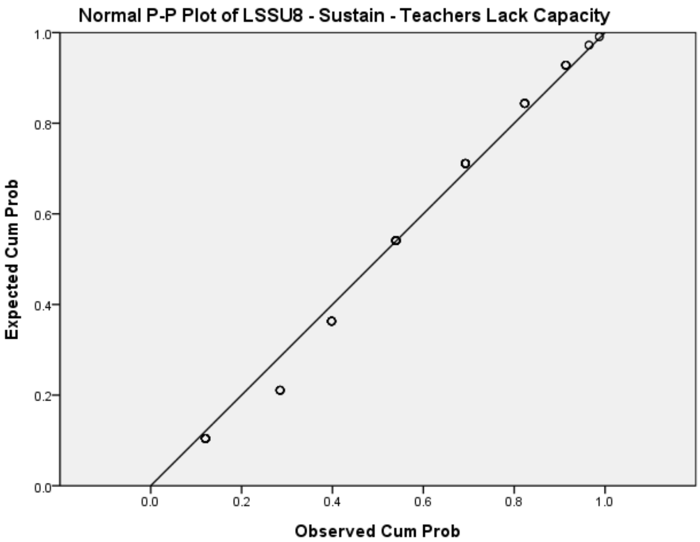

Figure 187 **P-P Plot LSSU8**

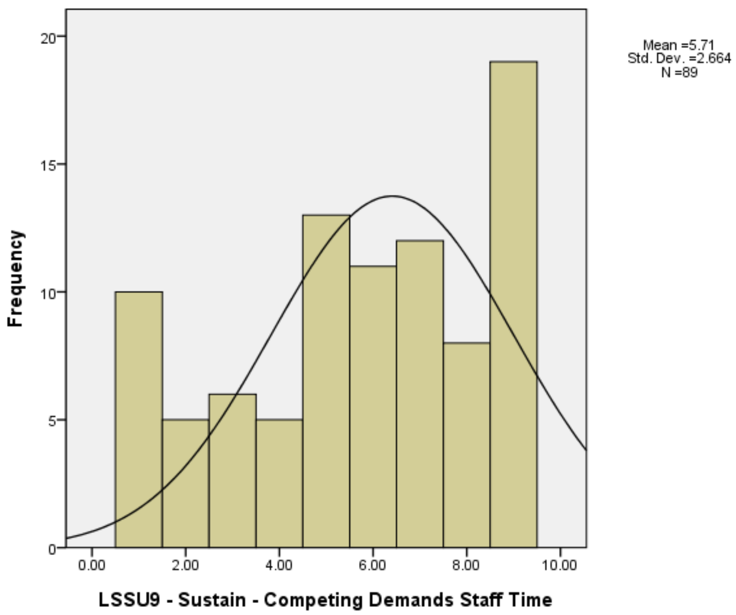

Figure 188 **Histogram LSSU9**

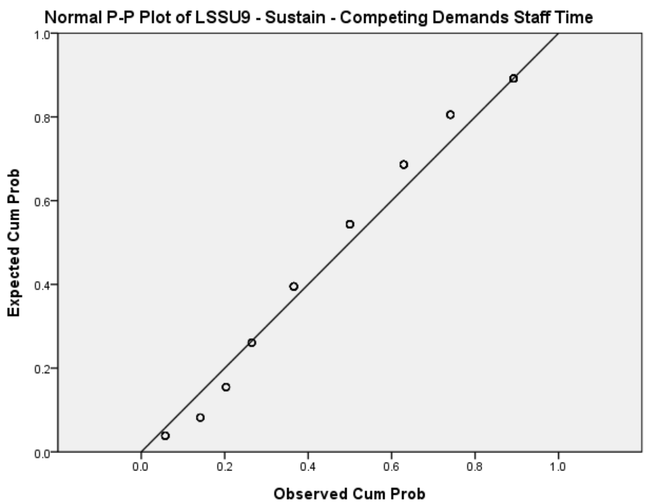

Figure 189 **P-P Plot LSSU9**

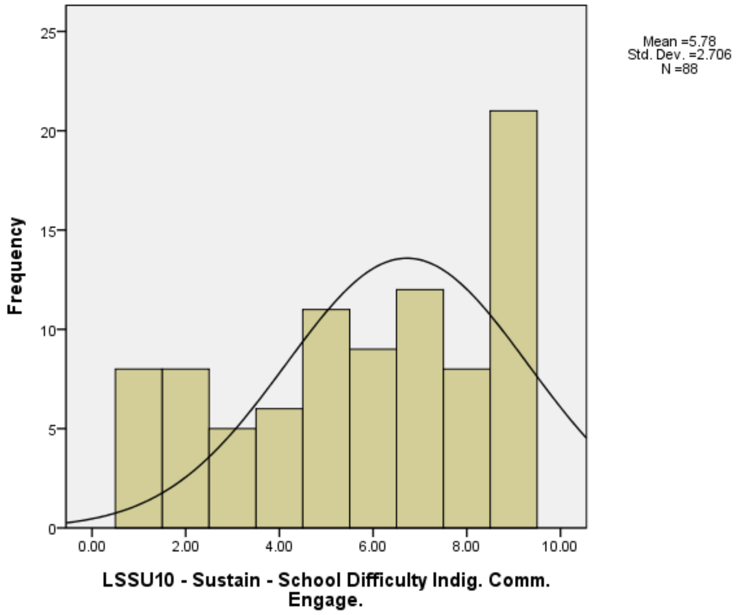

Figure 190 **Histogram LSSU10**

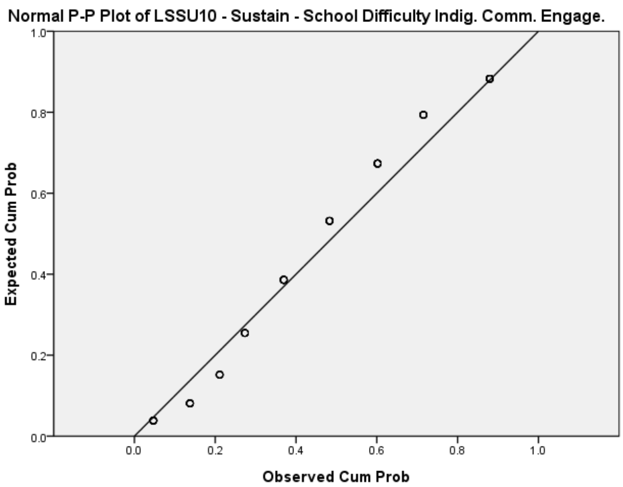

Figure 191 **P-P Plot LSSU10**

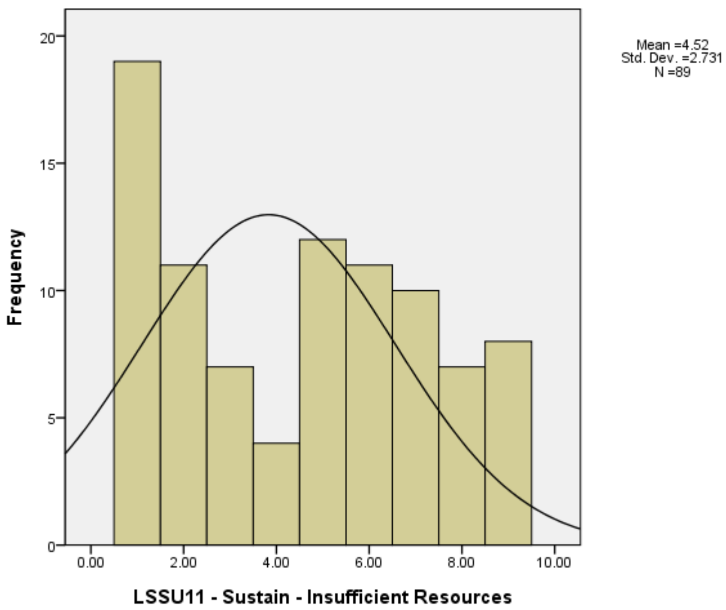

Figure 192 **Histogram LSSU11**

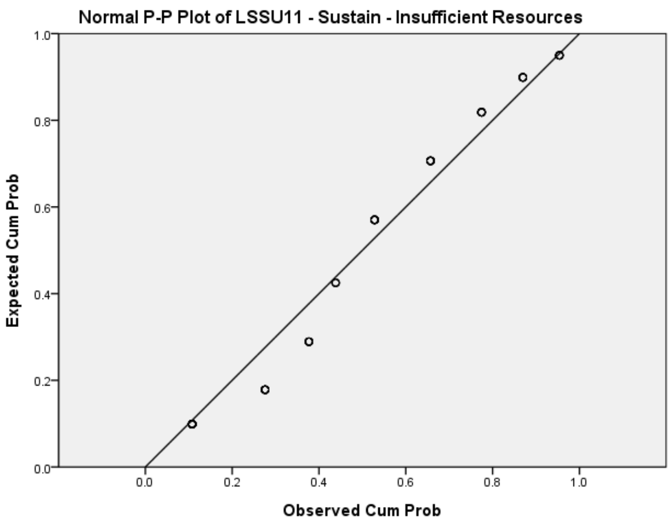

Figure 193 **P-P Plot LSSU11**

The measurement model

Given the sample used in this analysis is drawn from a constrained population (leaders) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 130).

Table 130 **Correlation matrix**

	LSSU1	LSSU2	LSSU3	LSSU4	LSSU5	LSSU6	LSSU7	LSSU8	LSSU9	LSSU10	LSSU11
LSSU1	1.000										
LSSU2	.000	1.000									
LSSU3	.340	-.073	1.000								
LSSU4	.402	-.007	.446	1.000							
LSSU5	.272	.009	.380	.423	1.000						
LSSU6	.326	-.370	.289	.249	.432	1.000					
LSSU7	.357	-.366	.196	.212	.224	.690	1.000				
LSSU8	.260	-.426	.140	.085	.111	.621	.679	1.000			
LSSU9	.285	-.195	.273	.153	.335	.548	.494	.456	1.000		
LSSU10	.020	-.097	.304	.289	.352	.323	.159	.105	.261	1.000	
LSSU11	.367	-.047	.148	.068	.177	.363	.380	.398	.513	.129	1.000

The correlation matrix (refer Table 130) shows that only 12 out of 55 correlations are greater than 0.4, while an additional 14 correlations are greater than 0.3. The preponderance of lower correlations are of concern for performing an EFA. However, there are high inter-correlations between LSSU6, LSSU7, LSSU8 and LSSU9. This would suggest there may be some basis for applying an EFA.

Table 131 **KMO and Bartlett's Test**

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.817
Bartlett's Test of Sphericity	Approx. Chi-Square	322.398
	df	55
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 322.398 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.817 would suggest there is probably a factor structure underlying the variables (refer Table 131).

Table 132 **Multiple Correlation**

	Initial	Extraction
LSSU1	.363	.939
LSSU2	.256	.254
LSSU3	.303	.345
LSSU4	.365	.396
LSSU5	.384	.524
LSSU6	.646	.741
LSSU7	.605	.690
LSSU8	.568	.691
LSSU9	.452	.419
LSSU10	.251	.336
LSSU11	.364	.272

An examination of the squared multiple correlation (refer Table 132) coefficient (R^2) or communalities would indicate a reasonable level of variation (small < 0.3) in the items is being explained the latent factor with the exception of LSSU2 and LSSU11. Specifically between 25% and 94% of the variance in items is being explained by the underlying factor structure. The extraction is of concern for LSSU9, LSSU1 and LSSU2 as less variance is explained than the initial model i.e. a model which uses a linear combination of all other items as a predictor of the item in question. Given that there were several correlations greater than 0.3 between these variables it was a possibility that these items were indicative of an additional latent factor. The analysis was rerun to extract Eigenvalues greater than 0.7.

Table 133 **LMO and Bartlett's Test**

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.819
Bartlett's Test of Sphericity	Approx. Chi-Square	312.358
	df	55
	Sig.	.000

Acceptable values for Barlett's test of sphericity (χ^2 = 312.358, p=.000) and Kaiser-Meyer-Olkin (0.819) were obtained for the revised EFA (refer Table 133).

Table 134 **Communalities**

Communalities

	Initial	Extraction
LSSU1	.359	.569
LSSU2	.257	.328
LSSU3	.297	.355
LSSU4	.371	.596
LSSU5	.378	.512
LSSU6	.649	.759
LSSU7	.611	.711
LSSU8	.570	.687
LSSU9	.457	.564
LSSU10	.254	.352
LSSU11	.363	.593

.

Communalities (refer Table 134) for all items are greater than 0.3 upon extraction, and improved upon from the initial model. This demonstrates a great improvement on the EFA with Eigenvalues greater than 1.

Table 135 **Total Variance Explained**

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.028	36.621	36.621	3.602	32.744	32.744	2.086	18.966	18.966
2	1.741	15.823	52.445	1.298	11.801	44.545	1.379	12.537	31.503
3	1.145	10.410	62.855	.646	5.874	50.419	1.361	12.370	43.873
4	.951	8.648	71.502	.480	4.362	54.781	1.200	10.908	54.781
5	.657	5.969	77.472						
6	.579	5.261	82.733						
7	.508	4.616	87.349						
8	.427	3.879	91.228						
9	.413	3.754	94.982						
10	.297	2.702	97.684						
11	.255	2.316	100.000						

The above table (refer Table 135) shows that three of the eigenvalues exceed one, while an additional eigenvalue is close to one at .951. As a result, 4 factors will be extracted. Factor 1 is accounting for ~ 37% of the total variance of 9 (11 because we have 11 variables and the variance for each variable has been standardised to 1). Factor 2 explains a further 16% of the total variance; factor 3 an additional 10%; and factor 4 an additional 9%.

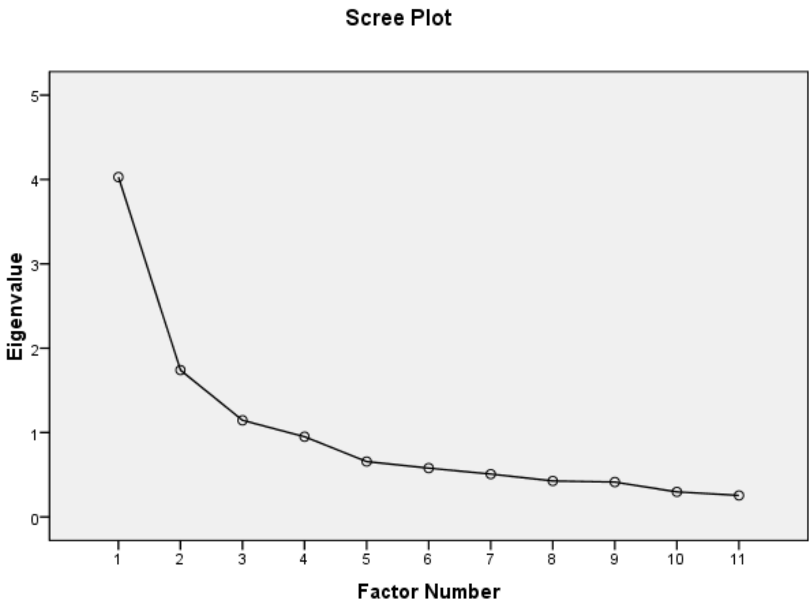

Figure 194 **Scree Plot**

Examination of the scree plot (refer Figure 194) clearly indicates that a four factor solution is appropriate, although it also suggests that up to 5 factors may explain the variance in the data.

The factor matrix (refer Table 136) gives the factor loadings for each item on the underlying constructs. It is clear most items load well on at least one factor. However, factor loadings for items LSSU2 and LSSU10 are below 0.4.

Table 136 **Factor Matrix**

Factor Matrix

	Factor			
	1	2	3	4
LSSU6	.845		-.190	
LSSU7	.803	-.209		-.141
LSSU8	.739	-.350		-.132
LSSU9	.674		.174	.281
LSSU11	.537		.508	.208
LSSU1	.493	.299	.378	-.308
LSSU2	-.385	.282	.297	.106
LSSU10	.324	.323	-.244	.289
LSSU4	.353	.630		-.260
LSSU5	.440	.495	-.136	.234
LSSU3	.374	.461		

The χ^2 test for goodness of fit (refer Table 137) is not significant, which suggests that the model is a good fit to the data.

Table 137 **Goodness-of-fit-Test**

Goodness-of-fit Test

Chi-Square	df	Sig.
6.159	17	.992

Table 138 Rotated Factor Matrix

Rotated Factor Matrix

	Factor			
	1	2	3	4
LSSU8	**.752**		.331	.107
LSSU7	**.742**	.112	.319	.215
LSSU6	**.688**	*.415*	.304	.147
LSSU2	**-.566**			
LSSU5		**.646**	.148	.262
LSSU10		**.581**		
LSSU11	.158		**.741**	.119
LSSU9	.339	.341	**.572**	
LSSU4		.390		**.662**
LSSU1	.132		.377	**.640**
LSSU3		*.407*		**.423**

While the rotated factor matrix (refer Table 138) does indicate the presence of four factors (bolded), it is important to note that there are also cross loadings (italicised). The first factor refers to limited teacher capacity with respect to Indigenous education, the second factor refers to a lack of resources related to Indigenous knowledge/ engagement, while the third factor relates to limited resources, and the fourth, limited staff.

Confirmatory factor analysis

A four factor model (refer Figure 195) of Sustainability was specified as a latent variable with 3 and 5 reflective indicators, respectively. It is normal in a congeneric measurement model to set the scale of the latent variable by fixing the variance of the construct to one rather than the usual practice of setting a factor loading to 1. The model with standardised parameters is illustrated below (refer Figure 195) .

The model converged and was a good fit to the data χ^2 (38)= 49.759, p=096. The factor coefficients ranged from a low of -0.44 to a high of 0.84. All coefficients exceed 0.4 so on this basis all items would be retained if the model was a good fit.

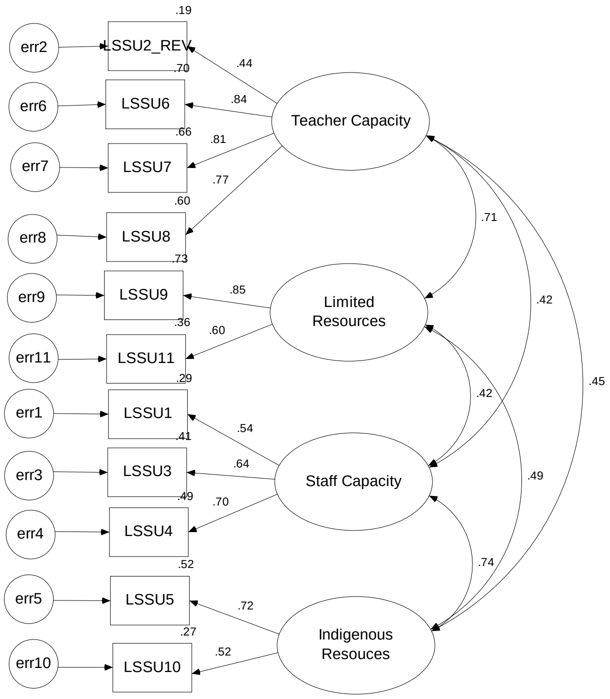

Figure 195 **Four Factor Measurement Model**

However, there were several issues with the four factor model (refer Figure 195). Item LSSU1 was not a good fit to the model, as examination of the modification indices (MI) suggested that the χ^2 value would decrease by 6 units if the covariance of the error terms associated with the indicators LSSU1 and LSSU11 was freely estimated. Review of the standardised residual covariance matrix also indicated LSSU1 was not a good fit and as a preliminary measure this item was removed. As a result of this deletion model fit was improved, χ^2 (29)= 30.189, p=405.

To simplify the model (refer Figure 195), the following changes were made. Only 19% of the variance in LSSU2 was explained by the Teacher Capacity factor, so it was deleted. Due to cross loadings, Indigenous Resources and Staff Capacity were collapsed onto one factor and renamed Systemic Imperatives. Given that the Limited Resources factor consisted of two highly correlated items, LSSU9 was moved to the Teacher Capacity factor based on correlations and cross loadings observed in the EFA, while LSSU11 was deleted.

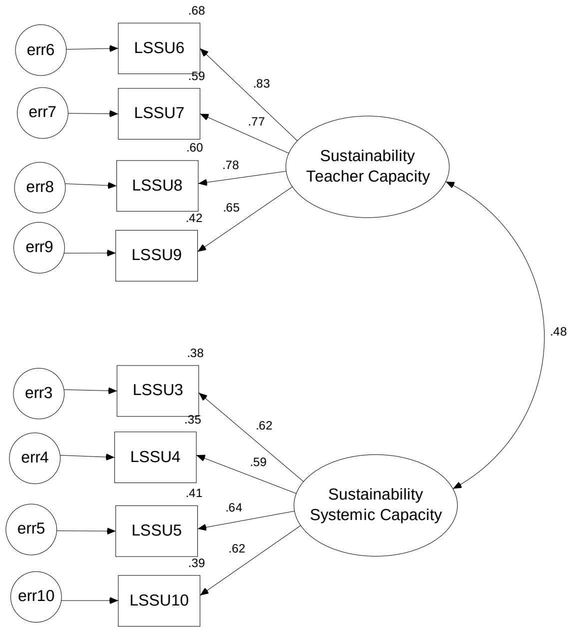

Figure 196 Two Factor Measurement Model

Now, the model (refer Figure 196) converged and was a good fit to the data. The factor coefficients ranged from a low of .66 to a high of .82 – which is a good result. In summary – a two factor model (refer Figure 196) of the latent construct Sustainability was specified as a congeneric model latent variables with 4 reflective indicators for each construct. The data fit the model well χ^2 (19)=24.127, p=.191, RMSEA = .055 (.000, .114), GFI = .936, TLI = .964 and CFI = .975.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case the tau model (χ^2 (26)=27.588, p=.379) fitted the data better than the congeneric model, but not the parallel model (χ^2 (34)=132.921, p=.000). Therefore congeneric model is retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). LSSU9 (.384), LSSU10 (.286), LSSU6 (.720), LSSU7 (.652), LSSU3 (.359), LSSU4 (.392), LSSU5 (.429) and LSSU8 (.559). LSSU6, LSSU7, and LSSU8 are above the “good” cut-off while LSSU9, LSSU10, LSSU3, LSSU4 and LSSU5 are above the acceptable cut off (Fornell & Larcker, 1981). In summary the Sustainability model is explaining between 28% and 72% of the variance across the individual indicator variables.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for the Sustainability model is .85 for the Teacher Capacity factor and .71 for the Systemic Capacity factor; well above the recommended cut off.

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the Sustainability model was .58 for the Teacher Capacity factor and .38 for the Systemic Capacity factor. In other words the factors are accounting for 58% and 38% of the variation in their respective indicator variables which is above the recommended cut off of 50% for the Teacher Capacity factor only.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Sustainability model was .86 for the Teacher Capacity factor and .71 for the Systemic Capacity factor which represents a high reliability.

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The Sustainability factor model fitted well as confirmed by the non significant χ^2 supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the items were LSSU7 (8.448), LSSU6 (9.035), LSSU8 (7.645), LSSU5 (5.563), LSSU10 (4.519), LSSU9 (6.047), LSSU4 (5.329) and LSSU3 (5.061), which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommented that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for indicator items were .81, .85, .75, .66, .54, .62, .53 and .60. It is not a necessary condition for convergent validity for all factor loadings to be above .7 and as the factor loadings are above or close to .7 the argument for convergent validity is reinforced.

Index score

A scale score for the Sustainability construct that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression (refer to Tables below) coefficient of each indicator and summing. Note that these scale scores are based on the Tau equivalent model.

Table 139 Teacher Capacity Regression Weights

Teacher Capacity	SU3	SU4	SU5	SU6	SU7	SU8	SU9	SU10
Raw Regression Weights	0.008	0.007	0.009	0.175	0.119	0.123	.059	0.008
Proportional Regression Weights	0.016	0.014	0.018	0.344	0.234	0.242	0.116	0.016

Table 140 Systemic Capacity Regression Weight

Systemic Capacity	SU3	SU4	SU5	SU6	SU7	SU8	SU9	SU10
Raw Regression Weights	0.095	0.084	0.106	0.029	0.019	0.020	0.010	0.096
Proportional Regression Weights	0.207	0.183	0.231	0.063	0.041	0.044	0.022	0.209

The scale scores then become:

Teacher Capacity index = (LSSU3*.016) + (LSSU4*.014) + (LSSU5*.018) + (LSSU6*.344) + (LSSU7*.234) + (LSSU8*.242) + (LSSU9*.116) + (LSSU10*.016)

Systemic Capacity index = (LSSU3*.207) + (LSSU4*.183) + (LSSU5*.231) + (LSSU6*.063) + (LSSU7*.041) + (LSSU8*.044) + (LSSU9*.022) + (LSSU10*.209)

Appendix 3.2.6 Indigenous Leadership Measurement Models

Table 141 **Indigenous Measurement Model – The Items**

The Items

Item name	Description
LSIL1	Indigenous and non-Indigenous staff plan curriculum together.
LSIL2	Indigenous community members are involved in curriculum planning.
LSIL3	Indigenous community members are professional development leaders for school staff.
LSIL4	Indigenous staff hold formally recognised leadership positions in the school (e.g., deputy principal, head of department, head of curriculum, etc).
LSIL5	Indigenous staff hold informal leadership positions in the school (e.g., sports coordinator, before/ after school coordinator, responsible for Indigenous student initiatives, etc).
LSIL6	Indigenous staff hold committee positions in the school.
LSIL7	Indigenous community members hold committee positions on governance boards (e.g., councils and leadership groups).
LSIL8	Indigenous community members involved with the school mentor staff.
LSIL9	Indigenous students hold formally recognised leadership positions in the school (e.g., school captain, house captain, class captain or prefect).

Descriptives:

Table 142 Descriptives

	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
LSIL1	1.00	9.00	4.5600	.23539	2.63169	-.182	.217	-1.067	.430
LSIL2	1.00	8.00	2.8880	.19451	2.17469	.557	.217	-.869	.430
LSIL3	1.00	9.00	3.1920	.21120	2.36130	.499	.217	-.820	.430
LSIL4	1.00	9.00	2.4480	.23649	2.64409	1.440	.217	.658	.430
LSIL5	1.00	9.00	3.7120	.24411	2.72922	.340	.217	-1.197	.430
LSIL6	1.00	9.00	4.0640	.24541	2.74374	.120	.217	-1.231	.430
LSIL7	1.00	9.00	3.2000	.26176	2.92652	.786	.217	-.883	.430
LSIL8	1.00	9.00	3.3200	.22650	2.53237	.572	.217	-.753	.430
LSIL9	1.00	9.00	5.3520	.26427	2.95465	-.378	.217	-1.051	.430
Valid N (listwise)									

The minimum and maximum values for each variable lie in the scale range of 1-9 (refer Tables above) respectively indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 2.89 to 5.35 on a 9 point scale however most items have a mean around 3 with standard deviations around 2.5 suggesting adequate variance of response.

Missing value analysis indicated that 109 out of a total of 116 cases were complete with respect to the item list. One more case had a missing count of 1 out of 9 items. A decision was made to use maximum likelihood estimation (expectation-maximization EM) to impute likely values for those missing.

Both exploratory and confirmatory factor analysis are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo

& Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should be normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms and P-P plots (refer Figures below) would indicate some important departures from normality with all variables. This has implications for the estimation techniques used in the confirmatory factor analysis in particular.

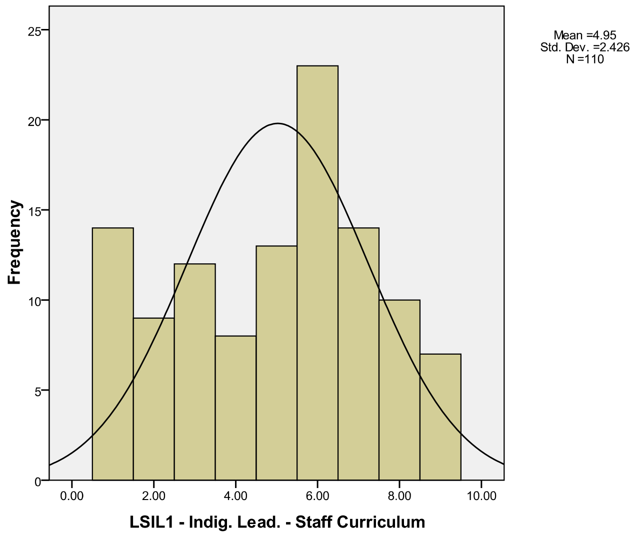

Figure 197 Histogram LSIL1

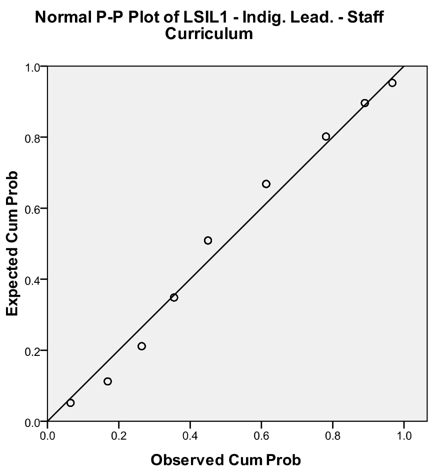

Figure 198 **P-Plot LSIL1**

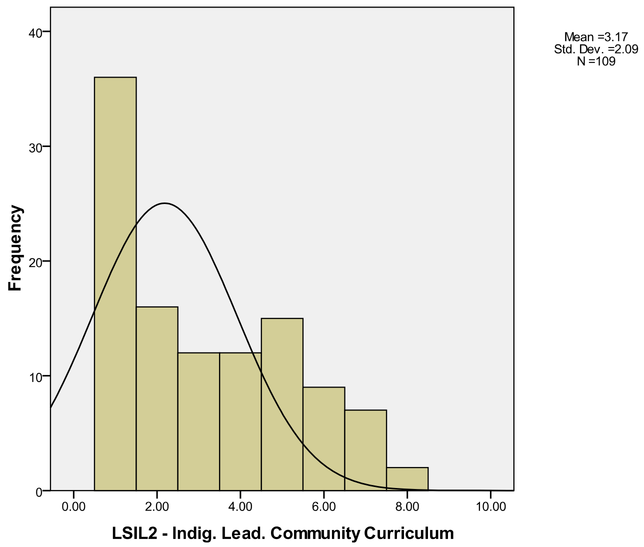

Figure 199 **Histogram LSIL2**

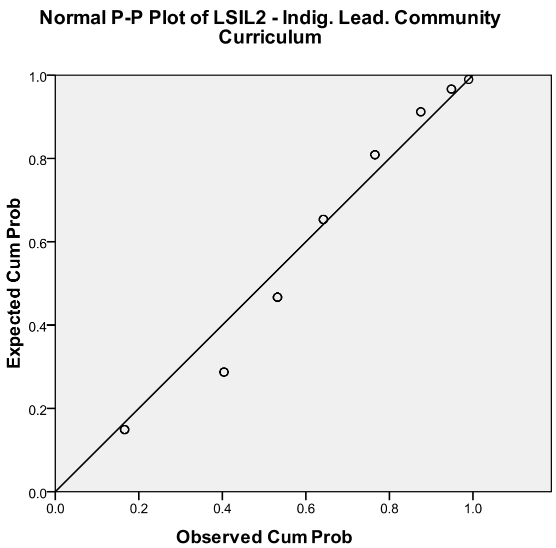

Figure 200 **P-P Plot LSIL2**

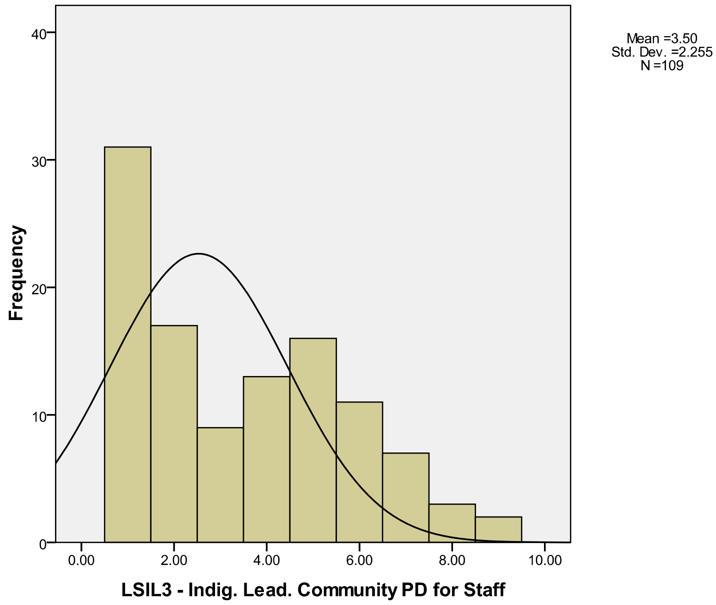

Figure 201 **Histogram LSIL3**

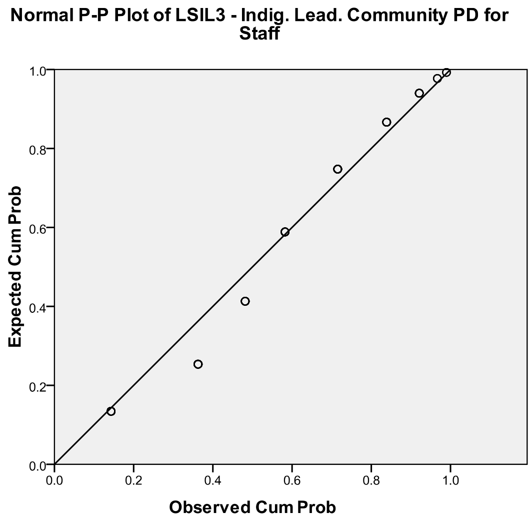

Figure 202 **P-P Plot LSIL3**

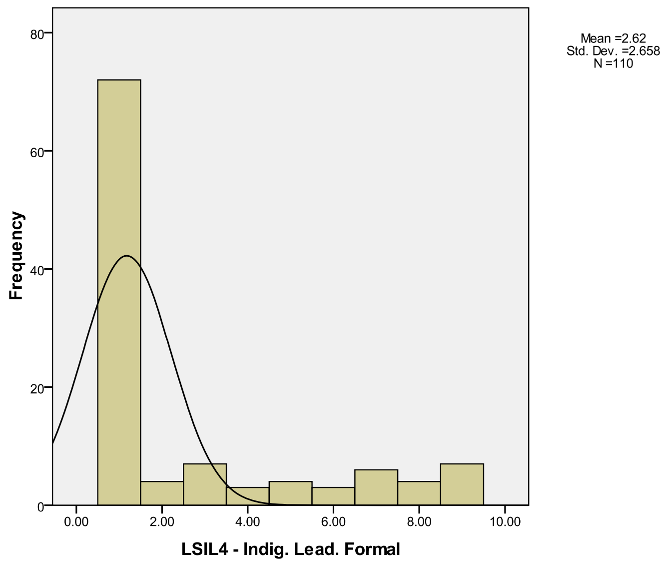

Figure 203 **Histogram LSIL4**

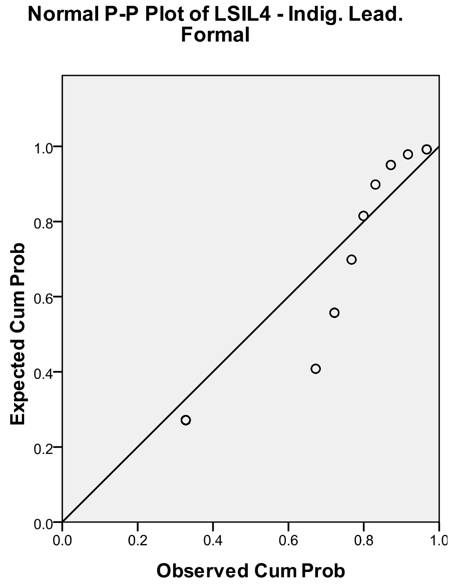

Figure 204 **P-P Plot LSIL4**

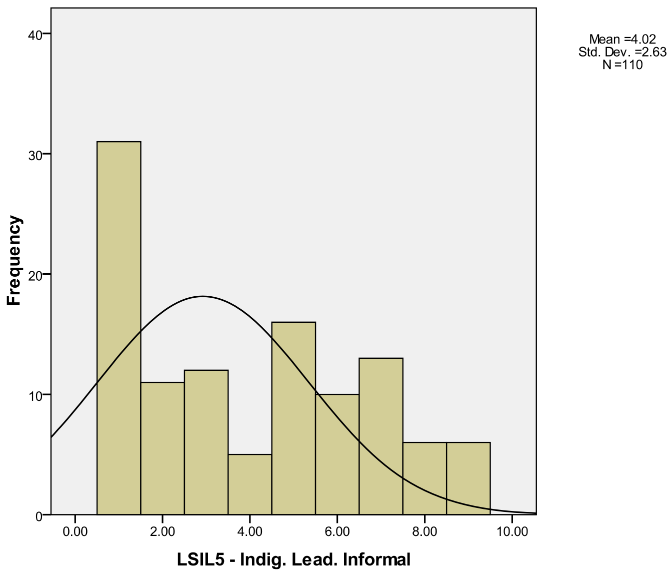

Figure 205 **Histogram LSIL5**

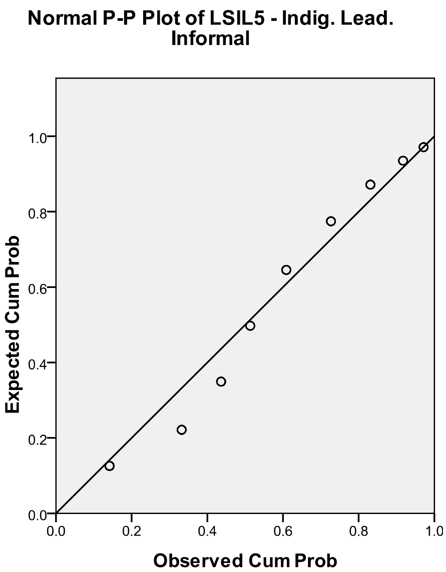

Figure 206 **P-P Plot LSIL5**

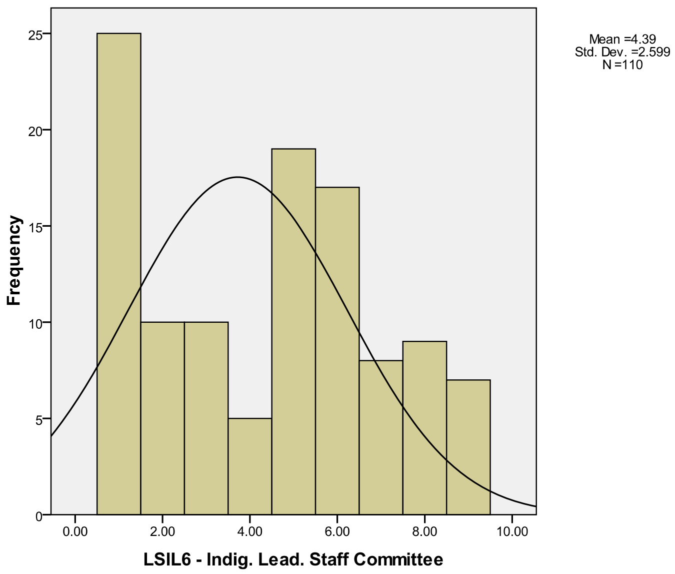

Figure 207 **Histogram LSIL6**

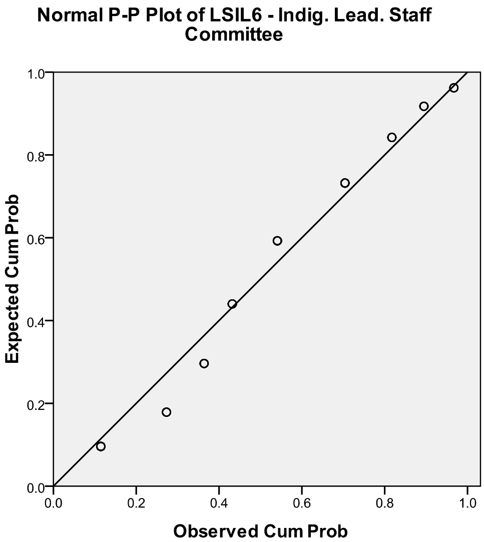

Figure 208 **P-P Plot LSIL6**

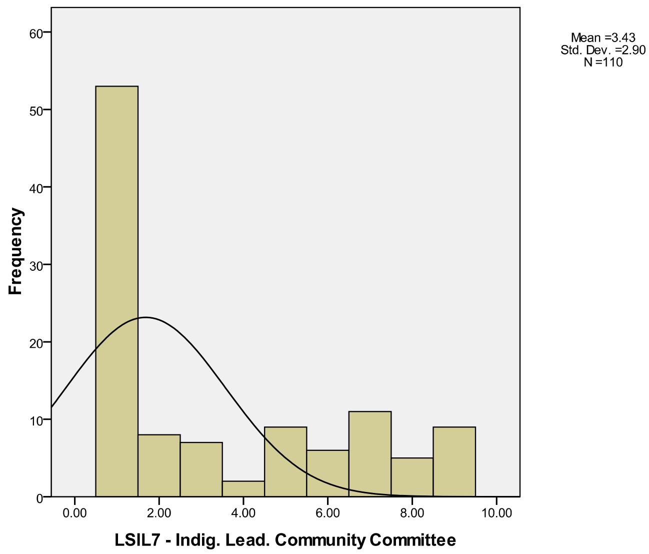

Figure 209 **Histogram LSIL7**

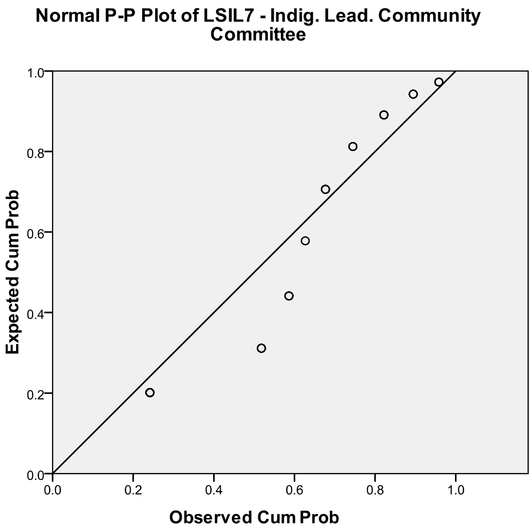

Figure 210 **P-P Plot LSIL7**

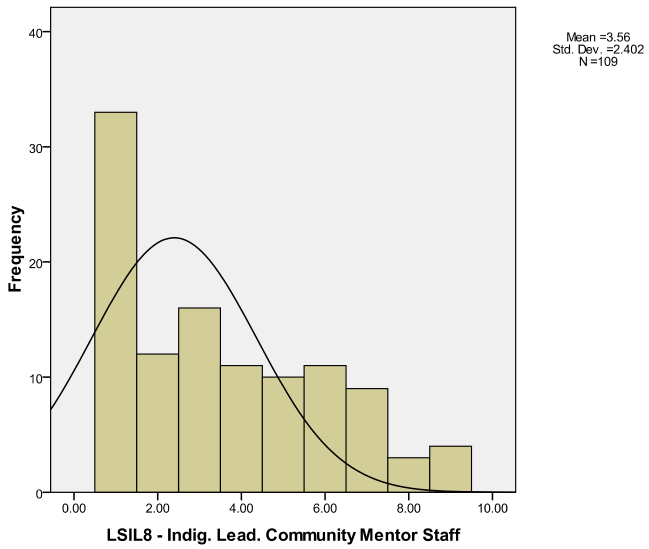

Figure 211 **Histogram LSIL8**

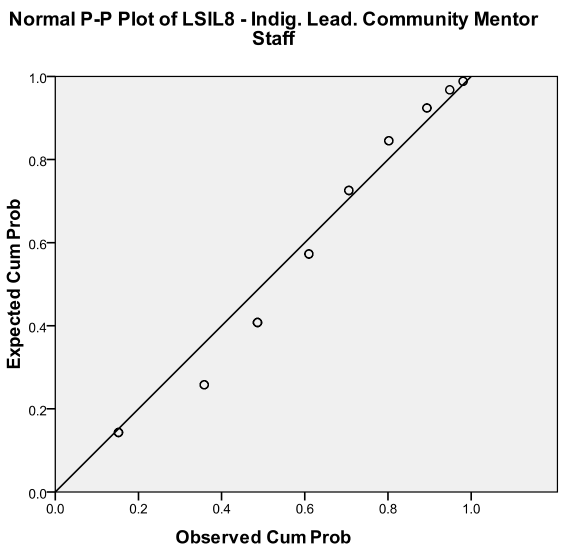

Figure 212 **P-P Plot LSIL8**

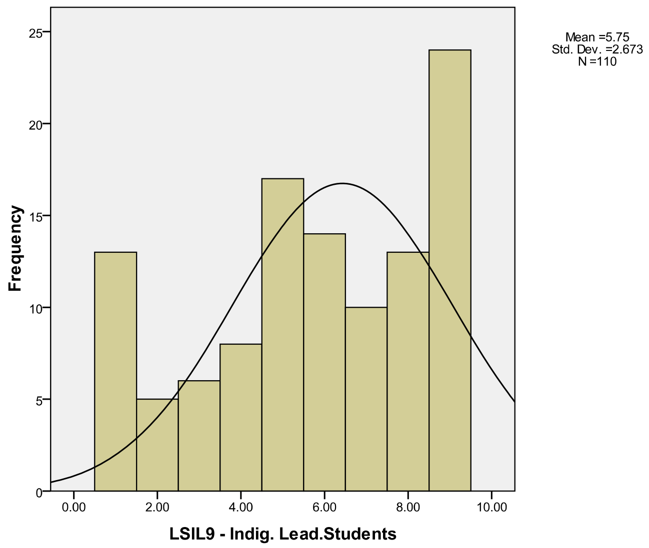

Figure 213 **Histogram LSIL9**

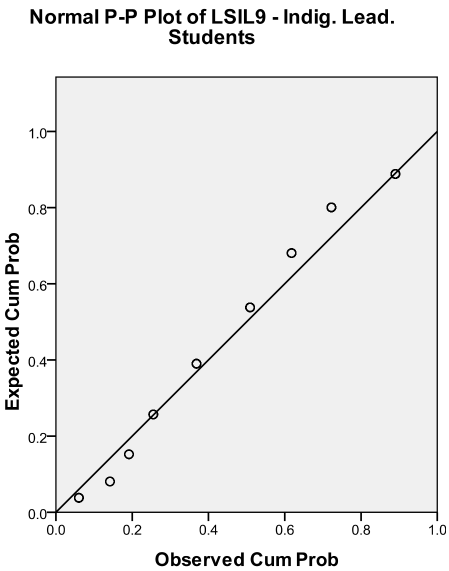

Figure 214 **P-P Plot LSIL9**

The measurement model

Given the sample used in this analysis is drawn from a constrained population (teachers) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis
As indicated previously much of the data follows a non normal distribution but as the factor analysis is being used in a descriptive way to summarise relationships, assumptions in regards to normal data may be relaxed as long as the deviation is not too large (Tabachnick & Fidell, 2007).

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 143).

Table 143 Correlation Matrix

	LSIL1	LSIL2	LSIL3	LSIL4	LSIL5	LSIL6	LSIL7	LSIL8	LSIL9
LSIL1	1								
LSIL2	.563**	1							
LSIL3	.604**	.604**	1						
LSIL4	.391**	.294**	.422**	1					
LSIL5	.509**	.478**	.518**	.557**	1				
LSIL6	.648**	.431**	.467**	.434**	.679**	1			
LSIL7	.431**	.442**	.380**	.481**	.462**	.494**	1		
LSIL8	.514**	.473**	.415**	.380**	.642**	.605**	.428**	1	
LSIL9	.424**	.223*	.257**	.225*	.323**	.520**	.351**	.268**	1

The correlation matrix shows the majority of the correlations are greater than 0.4 and most variables have a medium correlation with at least 2 or 3 other variables and all are significant. This would suggest there may be some basis for applying an EFA.

Table 144 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.872
Bartlett's Test of Sphericity	Approx. Chi-Square	450.824
	df	36
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 450.824 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-

Meyer-Olkin measure of 0.872 would suggest there is probably a factor structure underlying the variables (refer Table 144).

Table 145 Communalities

	Communalities	
	Initial	Extraction
LSIL1	.593	.598
LSIL2	.487	.409
LSIL3	.505	.447
LSIL4	.398	.338
LSIL5	.630	.632
LSIL6	.660	.668
LSIL7	.393	.379
LSIL8	.497	.507
LSIL9	.335	.240

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer 145) would indicate a reasonable level of variation (small < 0.3) in the items (except for item TSIL9) is being explained by the latent factor. Specifically between 24% and 67% of the variance in items is being explained by the underlying factor structure. Of concern is the extraction for 5 variables is explaining less variance in an item than the initial model i.e. a model which uses a linear combination of all other items as a predictor of the item in question. This suggests that there may be at least one additional factor. Therefore, the analysis was re run using an eigenvalue threshold of 0.7 for factor extraction.

Table 146 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.872
Bartlett's Test of Sphericity	Approx. Chi-Square	450.824
	df	36
	Sig.	.000

Acceptable values for Barlett's test of sphericity (χ^2 = 450.824, p=.000) and Kaiser-Meyer-Olkin (0.872) were obtained for the revised EFA (refer Table 146).

Table 147 **Communalities**

Communalities

	Initial	Extraction
LSIL1	.593	.701
LSIL2	.487	.590
LSIL3	.505	.622
LSIL4	.398	.365
LSIL5	.630	.838
LSIL6	.660	.801
LSIL7	.393	.357
LSIL8	.497	.518
LSIL9	.335	.454

Communalities (refer Table 147) for all items are greater than 0.3 upon extraction, and improved upon from the initial model, with the exception of LSIL7. This demonstrates a great improvement on the first EFA.

Table 148 **Total Variance Explained**

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.715	52.391	52.391	4.300	47.779	47.779	2.008	22.316	22.316
2	.934	10.383	62.774	.463	5.147	52.926	1.784	19.826	42.143
3	.828	9.199	71.972	.482	5.353	58.279	1.452	16.136	58.279
4	.687	7.638	79.610						
5	.583	6.477	86.087						
6	.361	4.015	90.102						
7	.340	3.783	93.885						
8	.324	3.596	97.481						
9	.227	2.519	100.000						

Three factors were extracted accounting for ~ 52%, 10% and 9% of the total variance of 9 respectively (9 because we have 9 variables and the variance (refer Table 148) for each variable has been standardised to 1).

Scree Plot

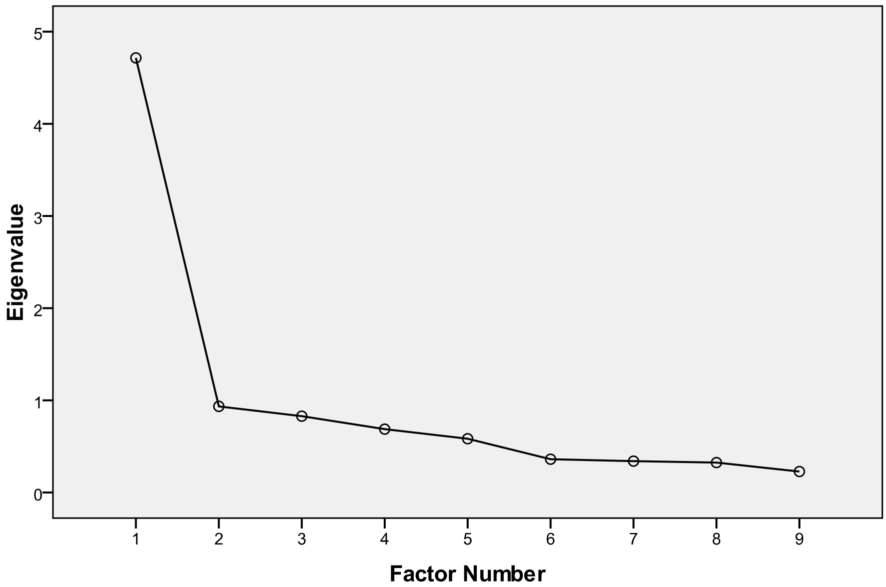

Figure 215 **Scree Plot**

Examination of the scree plot (refer Figure 215) indicates that a three factor solution is appropriate. However, the scree plot does not appear to level out completely until the sixth factor.

The factor matrix (refer Table 149) gives the factor loadings for each item on the underlying constructs. It is clear all items load well on at least one factor.

Table 149 **Factor Matrix**

Factor Matrix

	Factor		
	1	2	3
LSIL5	.849	-.304	.159
LSIL6	.842		-.297
LSIL1	.767	.323	
LSIL8	.711	-.100	
LSIL3	.670	.322	.262
LSIL2	.634	.338	.271
LSIL7	.593		
LSIL4	.580	-.112	.128
LSIL9	.488	.132	-.445

The χ^2 test for goodness of fit Test (refer Table 150) is not significant, which suggests that the model is a good fit to the data.

Table 150 Goodness-of-fit Test

Goodness-of-fit Test

Chi-Square	df	Sig.
16.366	12	.175

The factor matrix (refer Table 151) gives the factor loadings for each item on the underlying constructs. Conceptually, the first factor relates to Indigenous leadership roles within the school, while the second factor relates to Indigenous influence on teaching activities. The third factor does not really add to the model given that LSIL1 and LSIL6 are cross loading. LSIL7 does not load onto any factor. This EFA suggests a 2 factor model for Indigenous leadership containing the items LSIL5, LSIL8, LSIL4 and LSIL6 on one factor and LSIL1, LSIL2 and LSIL3 on the other factor.

Table 151 Rotated Factor Matrix

Rotated Factor Matrix

	Factor		
	1	2	3
LSIL5	**.835**	.299	.227
LSIL8	**.574**	.320	.292
LSIL4	**.511**	.282	.159
LSIL7	.360	.347	.327
LSIL3	.315	**.700**	.180
LSIL2	.281	**.698**	.158
LSIL1	.293	**.581**	*.527*
LSIL6	*.555*	.247	**.657**
LSIL9	.141	.132	**.645**

A key assumption underlying the use of confirmatory factor analysis is that the observations are drawn from a continuous and multivariate population. A consequence of contravening this assumption ,if maximum likelihood estimation is used, is the chi-square goodness of fit test will not produce an accurate estimate of fit, rejecting true models and parameter estimates will be biased yielding too many significant results (Anderson & Gerbing, 1988).

Even if all univariate distributions are normal (which is not the case in this instance) the joint distributions of the variables may depart substantially from multivariate normality. Mardia's coefficient was used as an indicator of degree of multivariate normality (Mardia, 1970).

Table 152 Assessment of normality (Group number 1)

Assessment of normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
LSIL6	1.000	9.000	.098	.421	-1.205	-2.580
LSIL2	1.000	8.000	.507	2.169	-1.003	-2.148
LSIL8	1.000	9.000	.594	2.542	-.779	-1.669
LSIL4	1.000	9.000	1.384	5.928	.378	.809
LSIL5	1.000	9.000	.305	1.308	-1.226	-2.624
LSIL3	1.000	9.000	.498	2.133	-.837	-1.793
LSIL1	1.000	9.000	-.184	-.787	-1.053	-2.254
Multivariate					**8.078**	**3.774**

The bolded figures (refer Table 152) in the table indicate variables whose distributions depart significantly from normal either by displaying skewness or kurtosis or both. Mardia's coefficient has a value 3.774 which suggests a moderate deviation from multivariate normality is present in the data.

Given the data is not multivariate normally distributed it is inappropriate to use estimation techniques that rely on this assumption for the reasons already outlined. While there are several alternatives to remedy this situation a decision was made to use the Bollen-Stine bootstrap as the appropriate solution for testing goodness of fit of the model while correcting for non normally distributed data.

Mahalanobis distance

Table 153 Observations farthest from the centroid (Mahalanobis distance) (Group number 1)

Observation number	Mahalanobis d-squared	p1	p2
83	**20.778**	**.004**	**.365**
105	**20.754**	**.004**	**.077**
59	19.402	.007	.043
91	16.686	.020	.169
107	15.301	.032	.284
8	15.116	.035	.181
32	14.930	.037	.113
46	14.773	.039	.067
62	14.758	.039	.029
84	14.681	.040	.014
33	14.422	.044	.010
35	13.996	.051	.011
103	13.721	.056	.009
72	13.457	.062	.008
34	13.015	.072	.012
54	13.001	.072	.006
42	12.520	.085	.011
19	12.134	.096	.018
109	12.133	.096	.009
30	12.082	.098	.005
104	12.017	.100	.003
108	11.500	.118	.009
60	11.257	.128	.011
110	10.550	.160	.065

Parameter estimates can also be affected by the presence of outliers. Some top level checks for detecting outliers due to possible errors in data entry have been carried out previously. A table of Mahalanobis distances (refer Table 53) was calculated to assist in detecting outliers due to other causes. The bolded figures in the table indicate cases 83 and 105 are furthest from the centre of the distribution. However the drop in distance to the next observation (case 59) is not large so it is unlikely these cases could be considered outliers.

Confirmatory factor analysis

A confirmatory factor analysis (refer Table 154)was performed to further validate the proposed two factor model.

Table 154 **Confirmatory factor analysis**

The Indigenous Leadership factor was mapped by the following items in the CFA.

	Indigenous Influence on Teaching
LSIL1	Indigenous and non-Indigenous staff plan curriculum together.
LSIL2	Indigenous community members are involved in curriculum planning.
LSIL3	Indigenous community members are professional development leaders for school staff.

	Items – Indigenous Leadership Roles within the School
LSIL4	Indigenous staff hold formally recognised leadership positions in the school (e.g., deputy principal, head of department, head of curriculum, etc).
LSIL8	Indigenous community members involved with the school mentor staff.
LSIL5	Indigenous staff hold informal leadership positions in the school (e.g., sports coordinator, before/ after school coordinator, responsible for Indigenous student initiatives, etc).
LSIL6	Indigenous staff hold committee positions in the school.

A two factor congeneric model (refer Table 154) of Indigenous Leadership was specified as two latent variables with 3 and 4 reflective indicators respectively. The model with standardised parameters is illustrated below (refer Figure 216).

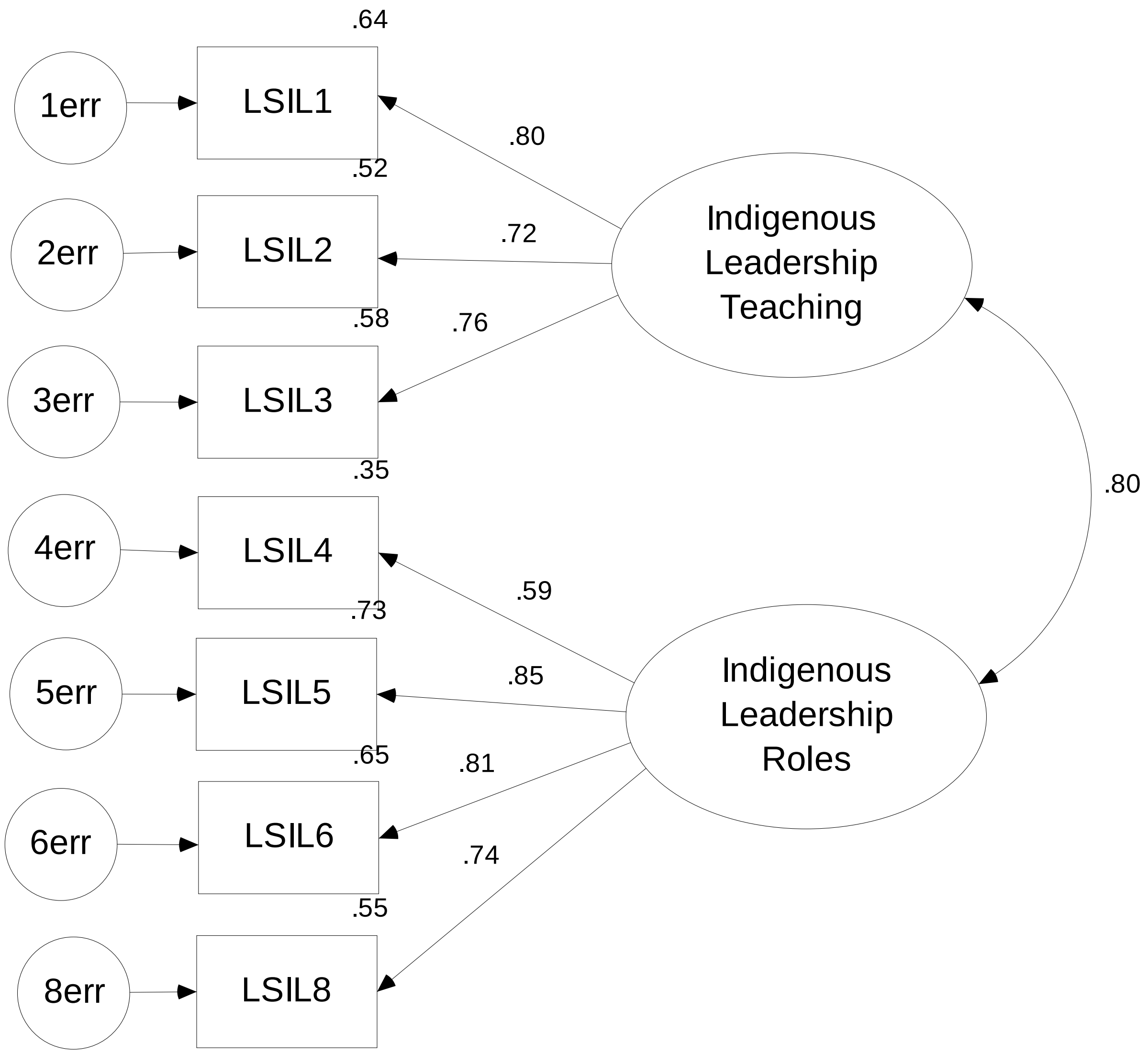

Figure 216 **Indigenous Leadership Model**

The model (refer Figure 216) converged and was a good fit, Bollenstein p=.167. The factor coefficients ranged from a low of .59 to a high of .85. However, the modification indices suggested an area of misspecification.

An examination of the modification index (MI) indicated the chi square value would decrease by at least 12 units if the covariance of the error terms associated with the indicators LSIL6 and LSIL1 was freely estimated. As such, LSIL6 was removed as it did not explicitly relate to a leadership position and was therefore conceptually dissimilar to the other items.

Solution 2 (2 factor model)

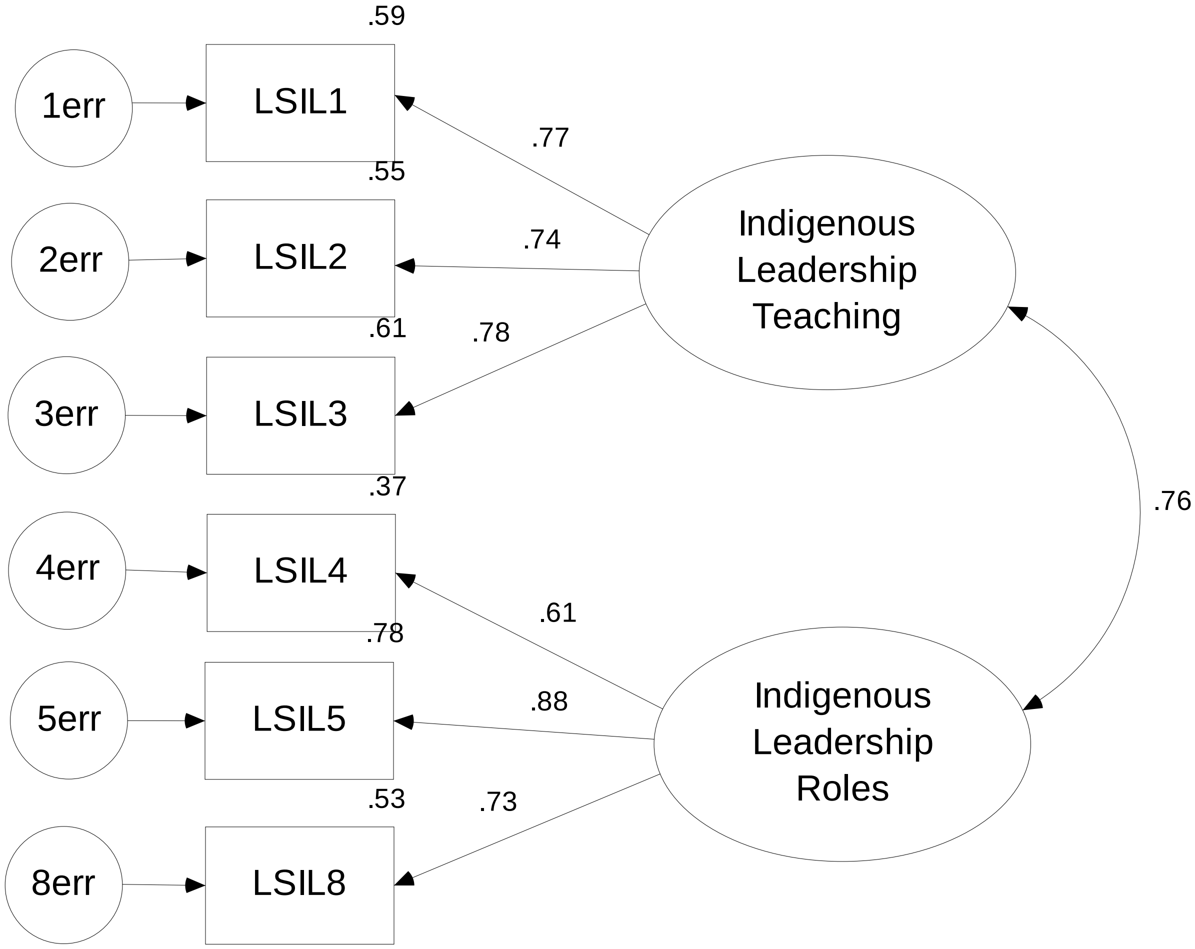

Figure 217 **Indigenous Leadership Roles Model**

The model (refer Figure 217) converged and was a good fit. The factor coefficients ranged from a low of 0.61 to a high of 0.88.

In summary – a two factor model of the latent construct Indigenous Leadership was specified as two correlated latent variables with 3 and 4 reflective indicators respectively. The data fit the model well Bollenstein p=.568, RMSEA = .013 (.000, .113), GFI = .976, TLI = .999 and CFI = .999.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case the parallel model (Bollenstein p=.007) and the tau model (Bollenstein p=.217) did not fit the data well so the congeneric model was retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). The SMCs for the indicator variables mapped by the Indigenous Leadership factor were LSIL1 (.593), LSIL2 (.547), LSIL3 (.612), LSIL4 (.374), LSIL5 (.777), and LSIL8 (.529) - all are above or close to the "good" cut-off.

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the Indigenous Leadership model was .58 for the teaching factor, and .56 for the roles factor. In other words the factors are accounting for 58% and 56% of the variation in their respective indicator variables, which is above the recommended cut off of 50%.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for the Indigenous Leadership model is .81 for the teaching factor and .79 for the roles factor, both of which were well above the recommended cut off.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the Indigenous Leadership model was .81 for teaching and .84 for roles, which represents a high reliability (Hancock & Mueller, 2001).

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The Indigenous Leadership factor model fitted well as confirmed by the non significant Chi-square test of model fit thus supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were LSIL1 (8.715), LSIL2 (8.291), LSIL3 (8.899), LSIL4 (6.583), LSIL5 (10.300), and LSIL8 (8.120) - all of which are significant at the .05 level which support a claim for convergent validity.

Index Score

A scale score (refer Tables below) for the Indigenous Leadership constructs that takes into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing.

Table 155 Index Score

Indigenous Leadership Teaching	IL1	IL2	IL3	IL4	IL5	IL8
Raw Regression Weights	.236	.235	.271	.026	.108	.046
Proportional Regression Weights	.256	.255	.294	.028	.117	.050

Table 156 Index Score

Indigenous Leadership Roles	IL1	IL2	IL3	IL4	IL5	IL8
Raw Regression Weights	.049	.049	.056	.084	.344	.148
Proportional Regression Weights	.067	.076	.084	.124	.335	.202

The scale scores then become:

Indigenous Leadership Teaching = (LSIL1*.256) + (LSIL2*.255) + (LSIL3*.294) + (LSIL4*.028) + (LSIL5*.117) + (LSIL8*.050)

Indigenous Leadership Roles= (LSIL1*.067) + (LSIL2*.076) + (LSIL3*.084) + (LSIL4*.124) + (LSIL5*.335) + (LSIL8*.202)

This approach ensures the estimates of the scale score adjusted for measurement error is proportionally weighted by the actual contribution made by each indicator. The proportional regression weight scores sum to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same ‘metric’ as that of indicators for the construct.

Appendix 3.2.7 High Expectations Leadership

Table 157 High Expectations – The Items

The Items

Item name	Description
LSHEL1	Indigenous students are challenged on achieving their potential.
LSHEL2	High expectations for Indigenous student learning are promoted in school policies.
LSHEL3	High expectations for Indigenous student learning are promoted in staff meetings.
LSHEL4	Staff are mentored in the importance of high expectations for Indigenous students.
LSHEL5	The staff of this school takes collective responsibility for unlocking the potential in Indigenous students.
LSHEL6	Parents of Indigenous students are consulted about high expectations for their children.
LSHEL7	High expectations for Indigenous student learning are embedded in classroom context.

Descriptives:

Table 158 Descriptives

	Range	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
LSHE1	8.00	1.00	9.00	6.2963	.18477	1.92018	-.473	.233	-.259	.461
LSHE2	8.00	1.00	9.00	6.4815	.21069	2.18953	-.870	.233	.020	.461
LSHE3	8.00	1.00	9.00	6.7130	.18373	1.90940	-.572	.233	-.212	.461
LSHE4	8.00	1.00	9.00	6.3178	.21519	2.22591	-.635	.234	-.431	.463
LSHE5	8.00	1.00	9.00	6.1296	.20427	2.12283	-.484	.233	-.298	.461
LSHE6	8.00	1.00	9.00	6.0278	.19489	2.02535	-.293	.233	-.592	.461
LSHE7	8.00	1.00	9.00	5.8241	.21770	2.26236	-.345	.233	-.660	.461
Valid N (listwise)										

The minimum and maximum values for each variable lie in the scale range of 1-9 (refer Tables above) respectively indicating the absence of outliers that could arise from data entry problems. The mean scale scores on each variable ranged from 5.82 to 6.71 on a 9 point scale with standard deviations ranging between 1.91 and 2.26. While the mean values tend toward the high end of the scale (not unexpected given the thrust of the items) the standard deviation values would suggest the response range is adequate.

Missing value analysis indicated that 109 out of a total of 116 cases were complete with respect to the item list. One more case had a missing count of 3 out of 9 items. A decision was made to use maximum likelihood estimation (expectation-maximization EM) to impute likely values for those missing.

Both exploratory and confirmatory factor analysis are employed in subsequent analysis to build parsimonious measurement models. Both these techniques have a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

These techniques also require that the sample is drawn from a multivariate normal population(Chou, Bentler, & Satorra, 1991). That is the joint distributions of any combination of variables should normal. It is a necessary but not sufficient condition that each contributing variable should be normally distributed to satisfy the requirement for multi-normality. Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms and P-P plots would indicate some important departures from normality with some variables. This has implications for the estimation techniques used in the confirmatory factor analysis.

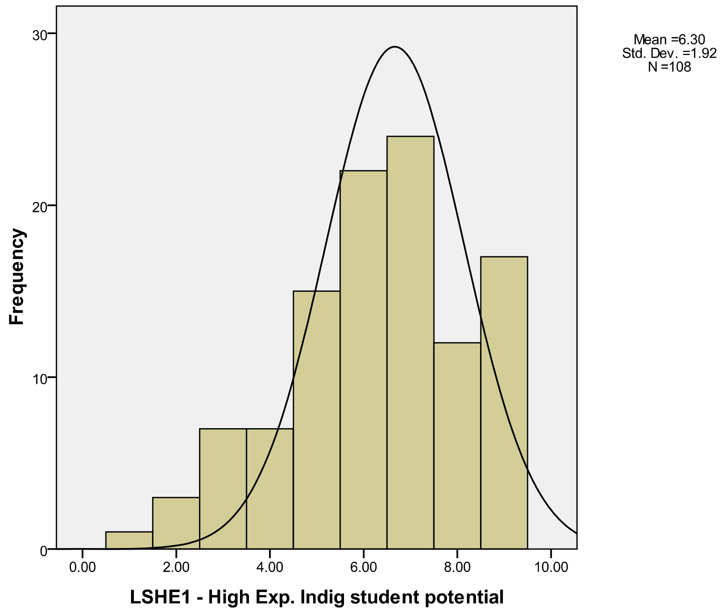

Figure 218 Histogram LSHE1

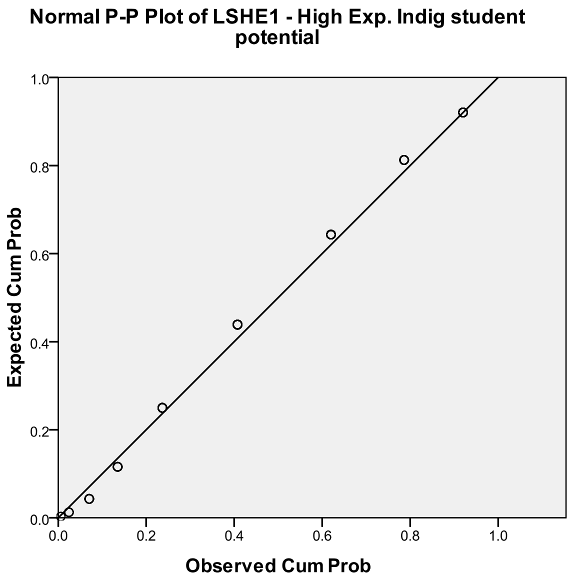

Figure 219 P-P Plot LSHE1

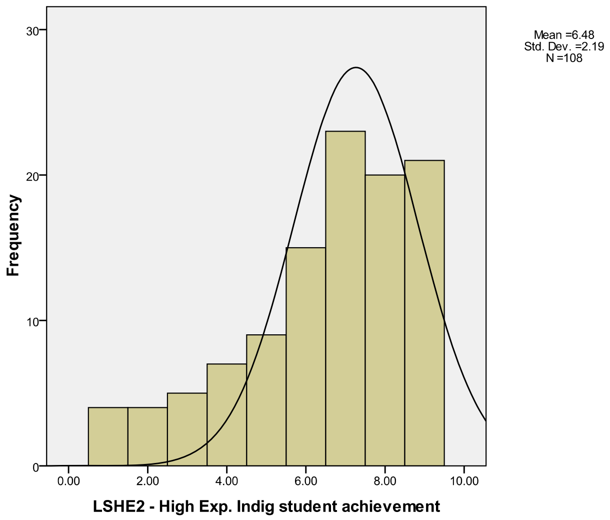

Figure 220 **Histogram LSHE2**

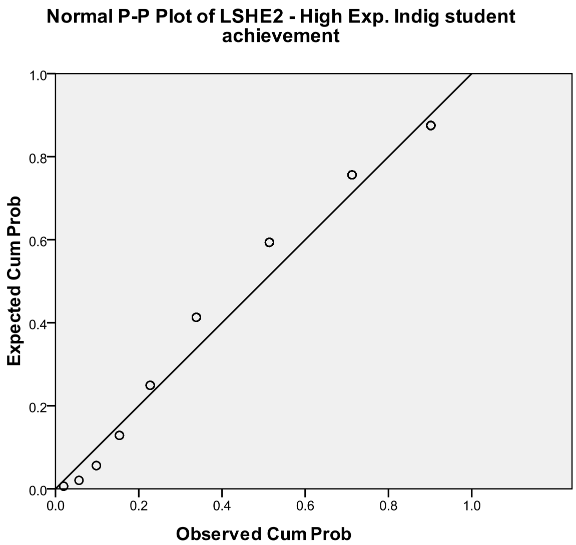

Figure 221 **P-P Plot LSHE2**

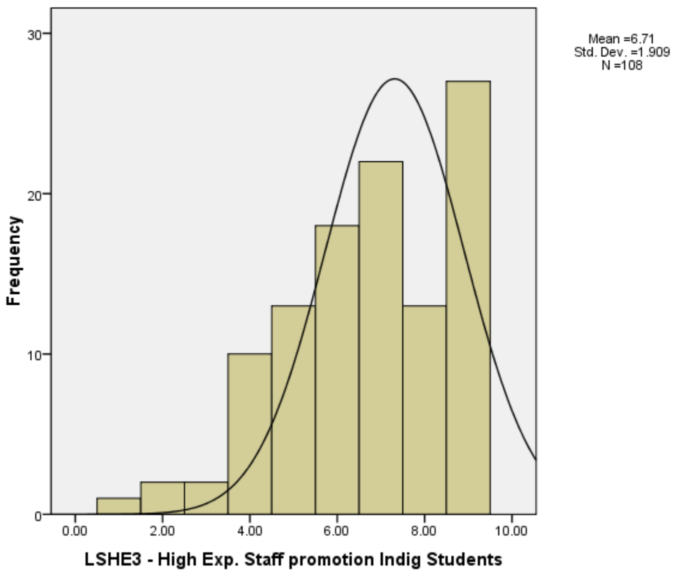

Figure 222 Histogram LSHE3

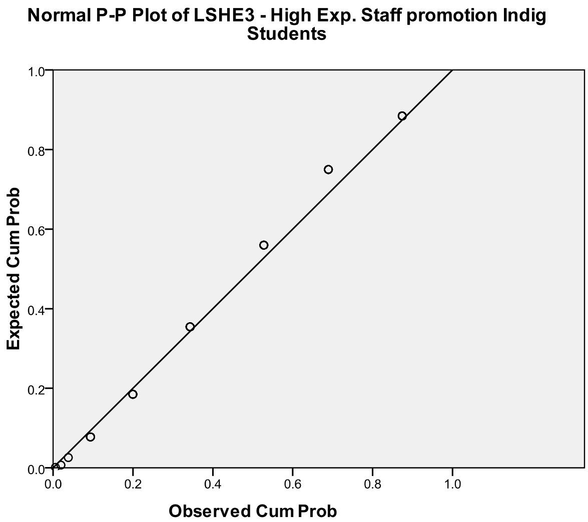

Figure 223 P-P Plot LSHE3

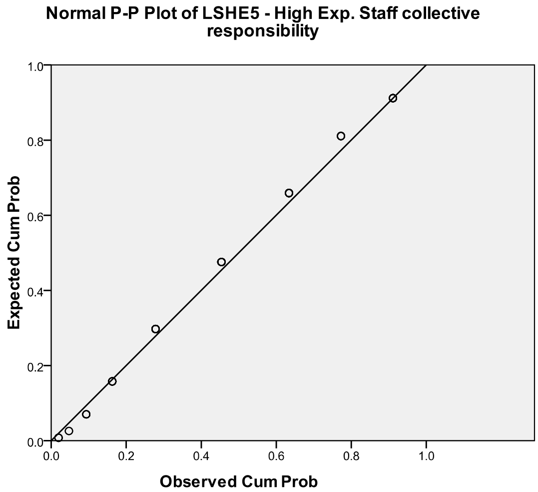

Figure 224 **P-P Plot LSHE5**

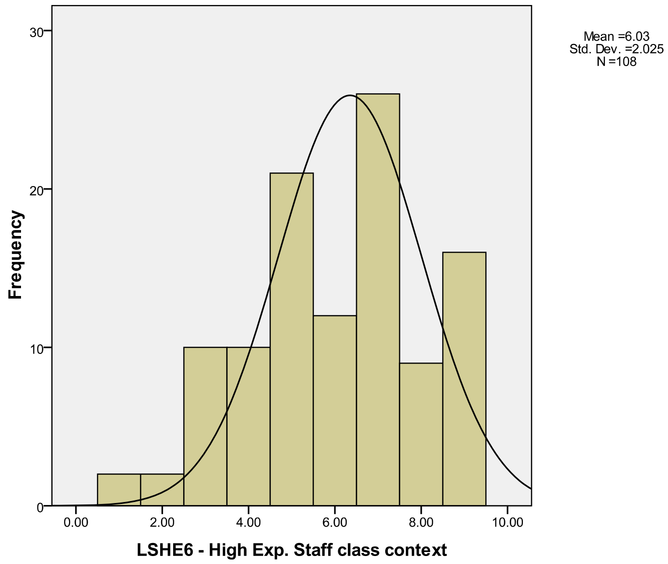

Figure 225 **Histogram LSHE6**

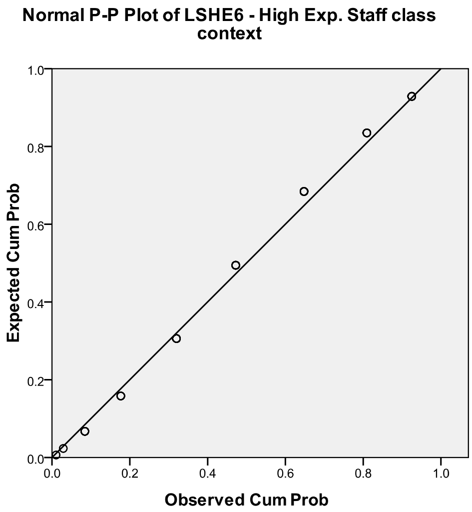

Figure 226 P-P Plot LSHE6

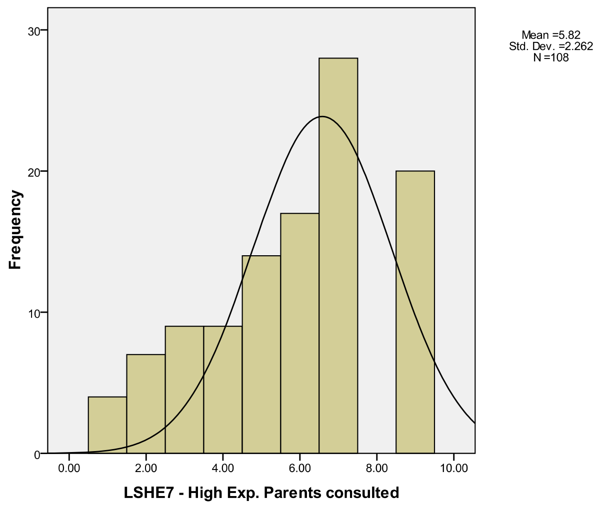

Figure 227 Histogram LSHE7

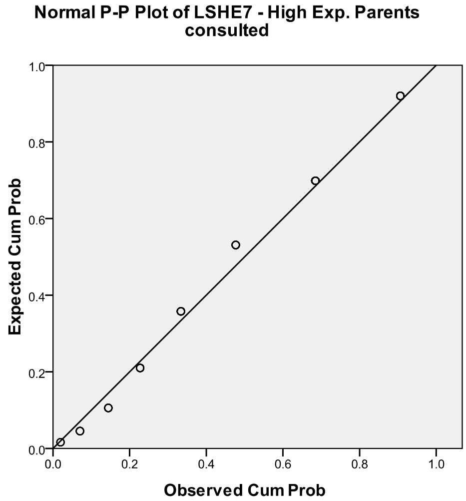

Figure 228 **P-P Plot LSHE7**

The measurement model

Given the sample used in this analysis is drawn from a constrained population (teachers) a two stage modelling process was adopted. In stage one an exploratory factor analysis (EFA) was conducted to determine which variables shared common variance and hence identify possible underlying constructs or latent variables. In the second stage, confirmatory factor analysis (CFA), in particular a single factor congeneric measurement model is constructed to validate the construct and compute composite scale scores.

Exploratory factor analysis

The first step in the EFA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (refer Table 159).

Table 159 Correlation Matrix

	LSHE1	LSHE2	LSHE3	LSHE4	LSHE5	LSHE6	LSHE7
LSHE1	1						
LSHE2	.750**	1					
LSHE3	.724**	.753**	1				
LSHE4	.707**	.788**	.717**	1			
LSHE5	.818**	.738**	.689**	.719**	1		
LSHE6	.788**	.730**	.674**	.703**	.784**	1	
LSHE7	.800**	.642**	.575**	.600**	.729**	.768**	1

The correlation matrix (refer Table 159) shows the majority of the correlations are greater than 0.4 and most variables have a medium to large correlation with at least 2 or 3 other variables and all are significant (though this is not surprising given the large sample size). This would suggest there may be some basis for applying an EFA.

Table 160 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.927
Bartlett's Test of Sphericity	Approx. Chi-Square	671.265
	df	21
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 671.265 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.927 would suggest there is probably a factor structure underlying the variables (refer Table 160).

Table 161 **Communalities**

Communalities

	Initial	Extraction
LSHE1	.795	.822
LSHE2	.731	.724
LSHE3	.647	.635
LSHE4	.688	.673
LSHE5	.740	.781
LSHE6	.732	.760
LSHE7	.691	.662

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 161) would indicate a reasonable level of variation (small < 0.3) in the items is being explained by all the latent factors. Between 64% and 82% of the variance in items is being explained by the underlying factor structure. However, for LSHE2, LSHE3 and LSHE4, the variance explained in the extracted model was less than the variance explained in the initial model. It is therefore a possibility that there is more than one factor. However, a one factor model was attempted first, given that the extracted communalities are close to or above 0.7.

Table 162 **Total Variance Explained**

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.329	76.127	76.127	5.057	72.237	72.237
2	.555	7.924	84.051			
3	.295	4.219	88.270			
4	.241	3.449	91.719			
5	.223	3.183	94.902			
6	.205	2.925	97.827			
7	.152	2.173	100.000			

The above table (refer Table 162) shows that only one of the eigenvalues exceeds one – as a result 1 factor will be extracted. Factor 1 is accounting for ~ 76% of the total variance of 7 (7 because we have 7 variables and the variance for each variable has been standardised to 1).

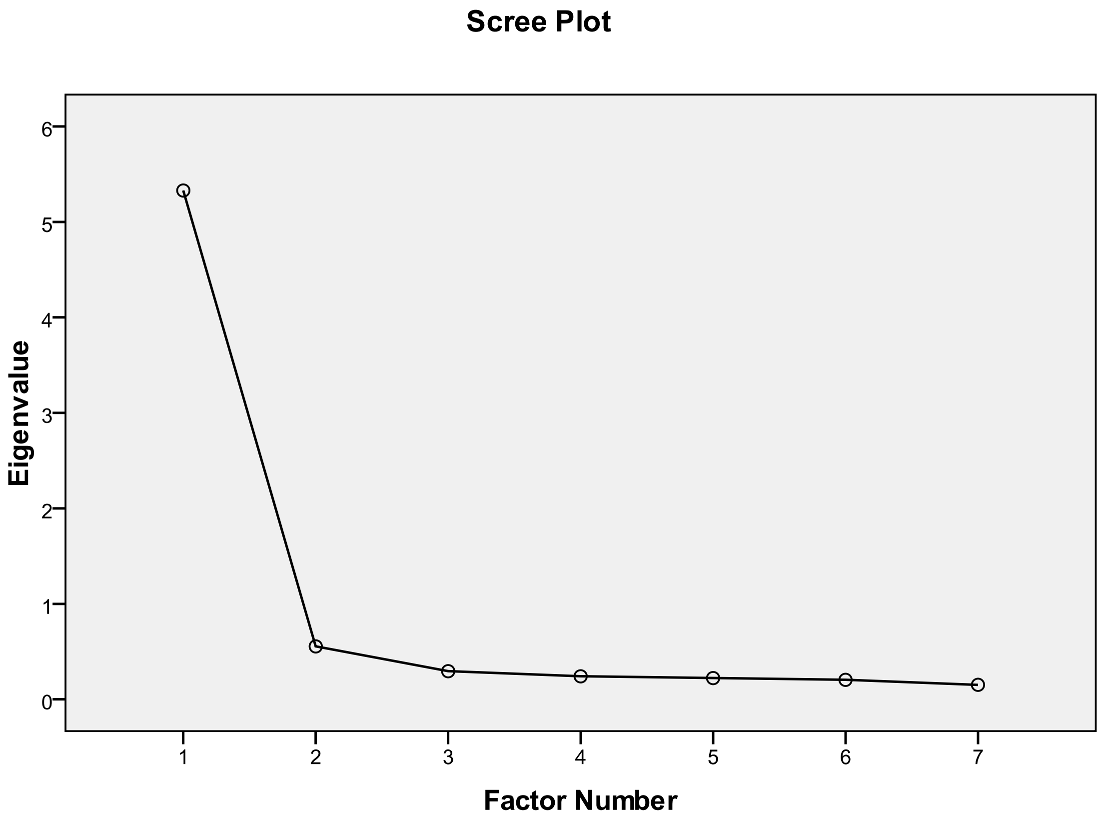

Figure 229 **Scree Plot**

Examination of the scree plot (refer Figure 229) would indicate a one factor solution is appropriate.

Table 163 **Factor Matrix**

Factor Matrix

	Factor
	1
LSHE1	.907
LSHE2	.851
LSHE3	.797
LSHE4	.820
LSHE5	.884
LSHE6	.872
LSHE7	.813

The factor matrix (refer Table 163) gives the factor loadings for each item on the underlying construct. It is clear all items load well on the single factor.

A key assumption underlying the use of confirmatory factor analysis is that the observations are drawn from a continuous and multivariate population. A consequence of contravening this assumption ,if maximum likelihood estimation is used, is the chi-square goodness of fit test will not produce an accurate estimate of fit, rejecting true models and parameter estimates will be biased yielding too many significant results (Anderson & Gerbing, 1988). Even if all univariate distributions are normal (which is not the case in this instance) the joint distributions of the variables may depart substantially from multivariate normality (refer Table 163). Mardia's coefficient was used as an indicator of degree of multivariate normality (Mardia, 1970).

Assessment of normality (Group number 1)

Table 164 Multivariate normality

Variable	min	max	skew	c.r.	kurtosis	c.r.
LSHE7	1.000	9.000	-.331	-1.443	-.707	-1.541
LSHE4	1.000	9.000	-.619	-2.699	-.513	-1.118
LSHE6	1.000	9.000	-.288	-1.257	-.618	-1.348
LSHE5	1.000	9.000	-.496	-2.163	-.307	-.669
LSHE1	1.000	9.000	-.466	-2.032	-.307	-.670
LSHE3	1.000	9.000	-.576	-2.509	-.300	-.654
LSHE2	1.000	9.000	-.842	-3.668	-.044	-.096
Multivariate					32.084	15.259

The bolded figures in the table indicate variables whose distributions depart significantly from normal either by displaying skewness or kurtosis or both. Mardia's coefficient has a value of 15.259 which suggests a moderate deviation from multivariate normality(refer Table 164) is present in the data.

Given the data is not multivariate normally distributed it is inappropriate to use estimation techniques that rely on this assumption for the reasons already outlined. While there are several alternatives to remedy this situation a decision was made to use the Bollen-Stine bootstrap as the appropriate solution for testing goodness of fit of the model while correcting for non-normally distributed data.

Mahalanobis distance

Table 165 Mahalanobis distance

Observations farthest from the centroid (Mahalanobis distance) (Group number 1)

Observation number	Mahalanobis d-squared	p1	p2
96	36.419	.000	.001
21	34.233	.000	.000
4	31.777	.000	.000
62	28.647	.000	.000
1	23.845	.001	.000
89	19.780	.006	.000
3	19.127	.008	.000
75	18.819	.009	.000
41	18.104	.012	.000
9	15.658	.028	.002
36	15.521	.030	.001
85	14.216	.047	.008
10	13.510	.061	.021

Parameter estimates can also be affected by the presence of outliers. Some top level checks for detecting outliers due to possible errors in data entry have been carried out previously. A table of Mahalanobis distances (refer Table 165) was calculated to assist in detecting outliers due to other causes. The bolded figures in the table indicate cases 4, 21, 62 and 91 are furthest from the centre of the distribution. Furthermore the drop in distance to the next observation (case 1) is quite large so these cases could be considered outliers and were deleted from further analysis. With these cases deleted, Madia's coefficient was reduced to 14.852.

Confirmatory factor analysis 1

Single factor congeneric measurement models was separately constructed and tested for fit. A single factor congeneric model of High Expectations Leadership (HEL) was specified as a latent variable with 7 reflective indicators. To set the scale of the latent variable the variance of the HEL construct was set to one rather than the usual practice of setting a factor loading to 1. This was done to allow a significance level to be generated for every factor loading. If a factor loading is set to one a significance level is not generated for that factor. The model with standardised parameters is illustrated.

The model converged but did not fit the data Bollen-Stine bootstrap p= .002. The factor coefficients ranged from a low of 0.82 to a high of 0.91. All coefficients exceed 0.4 so on this basis all items would be retained if the model was a good fit.

An examination of the modifications indexes indicated that large decreases in the chi square value could be achieved if the covariances (refer Table 166) associated with a number of error terms was freely estimated.

Table 166 Covariances: (Group number 1 – Default model)

Covariances: (Group number 1 - Default model)

			M.I.	Par Change
err6	<-->	err7	12.198	.421
err6	<-->	err4	4.897	-.262
err3	<-->	err7	4.747	-.284
err2	<-->	err4	17.128	.510
err2	<-->	err1	5.285	-.188
err2	<-->	err3	5.679	.235

This could be a result of the measurement model not being uni dimensional. This supports the EFA findings that suggested a second factor. On substantive grounds it could be argued a group of items maps the promotion of high expectations while a second set are more closely aligned with enactment. A decision was made to re run the EFA but force a two factor rotated solution.

Exploratory Factor Analysis 2

Table 167 KMO and Barlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.927
Bartlett's Test of Sphericity	Approx. Chi-Square	671.265
	df	21
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is 671.265 with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.927 would suggest there is probably a factor structure underlying the variables (refer Table 167).

Table 168 **Communalities**

Communalities	Initial	Extraction
LSHE1	.795	.839
LSHE2	.731	.806
LSHE3	.647	.697
LSHE4	.688	.758
LSHE5	.740	.772
LSHE6	.732	.768
LSHE7	.691	.797

An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 168) would indicate a reasonable level of variation (small < 0.3) in the items is being explained by all the latent factors. Specifically between 70% and 84% of the variance in items is being explained by the underlying factor structure. This is an improvement on the previous model both in magnitude of the variance explained and the factors accounting for more variance than the initial solution on all items.

Table 169 **Total Variance Explained**

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.329	76.127	76.127	5.106	72.938	72.938	2.792	39.885	39.885
2	.555	7.924	84.051	.330	4.715	77.653	2.644	37.768	77.653
3	.295	4.219	88.270						
4	.241	3.449	91.719						
5	.223	3.183	94.902						
6	.205	2.925	97.827						
7	.152	2.173	100.000						

The above table (refer Table 169) shows that two factors were extracted as specified. Factor 1 is accounting for 76% of the total variance of 7 (7 because we have 7 variables and the variance for each variable has been standardised to 1). The second factor is accounting for 8% of the total variance – together they account for 84% of the total variance.

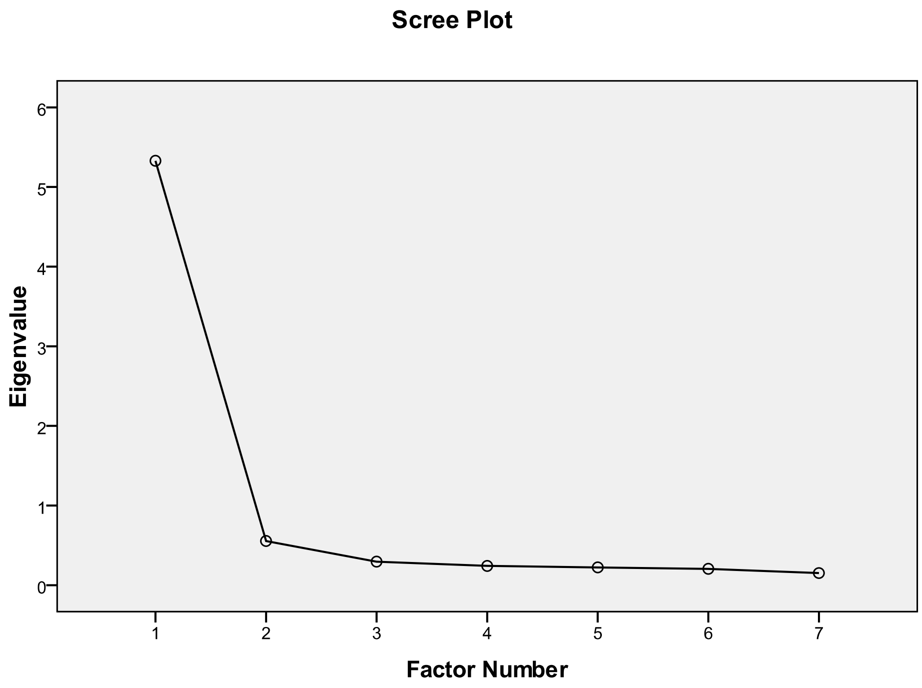

Figure 230 Scree Plot

Examination of the scree plot (refer Figure 230) would indicate a two factor solution is appropriate and parsimonious.

Table 170 **Rotated Factor Matrix**

Rotated Factor Matrix[a]

	Factor	
	1	2
LSHE1	.548	**.734**
LSHE2	**.783**	.438
LSHE3	**.731**	.404
LSHE4	**.771**	.404
LSHE5	.583	**.657**
LSHE6	.541	**.689**
LSHE7	.341	**.825**

The factor matrix gives the factor loadings for each item on the underlying construct. The two factor structure is clear (bold). Factor 1 would seem to best map the enactment of high expectations in schools while factor 2 would seem to map the promotion of high expectations to staff. However, almost all of the items share a cross loading of >0.4 on the other factor.

Confirmatory factor analysis 2

A measurement models with two correlated factors (refer Tables below) was constructed and tested for fit. To set the scale of the latent variable the variance of the construct was set to one rather than the usual practice of setting a factor loading to 1. This was done to allow a significance level to be generated for every factor loading. If a factor loading is set to one a significance level is not generated for that factor.

Table 171 **Confirmatory factor analysis 2**

	High Expectations Leadership and Promotion
LSHE2	High expectations for Indigenous student learning are promoted in school policies.
LSHE3	High expectations for Indigenous student learning are promoted in staff meetings.
LSHE4	Staff are mentored in the importance of high expectations for Indigenous students.

Table 172 **Confirmatory factor analysis 2**

	High Expectations Enactment
LSHE1	Indigenous students are challenged on achieving their potential.
LSHE5	The staff of this school takes collective responsibility for unlocking the potential in Indigenous students.
LSHE6	High expectations for Indigenous student learning are embedded in classroom context.
LSHE7	Parents of Indigenous students are consulted about high expectations for their children.

The model with standardised parameters is illustrated (refer Figure 231 below).

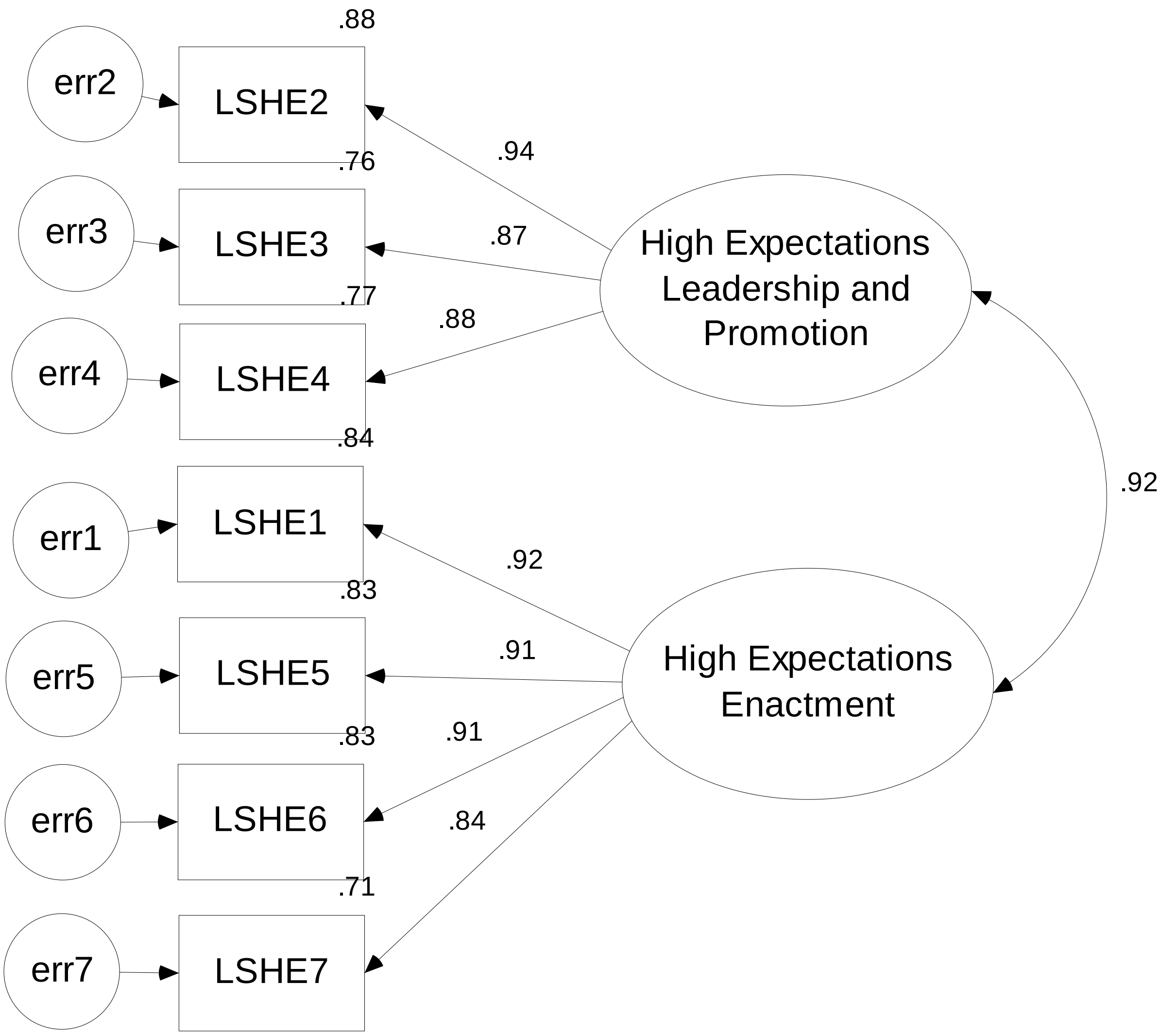

Figure 231 **High Expectations Model**

The model (refer Figure 231) converged and was a good fit. The standardised factor coefficients ranged from a low of 0.84 to a high of 0.94 – which is a good result. The error variances ranged from 1.77 to 2.9 which is also good. Variance accounted for by the factor across indicators ranged from .552 to .811 – also good.

In summary – a two factor model of the latent construct High Expectations was specified as two correlated latent variables with 3 and 4 reflective indicators respectively. The data fit the model well Bollen-Stine bootstrap $p = 0.223$, RMSEA = .075 (.000, .132), GFI = .949, TLI = .984 and CFI = .990.

The question that still needs to be answered "is the less parsimonious congeneric model significantly better than the more parsimonious parallel or tau equivalent models?"

The parallel model is nested within the tau model which in turn is nested within the congeneric model. If the alternative models fit the data well a difference χ^2 test can be performed to determine if the models are significantly different from the congeneric model. If there is no significant difference the more parsimonious model is to be preferred. In this case neither the tau model (Bollen-Stine bootstrap $p = 0.119$) nor the parallel model (Bollen-Stine bootstrap $p = 0.000$) fitted the data well so the model is retained.

Reliability and validity measures

Traditional approaches to reporting reliability and validity are not easily transferred to congeneric measurement and other SEM models. Traditional measures do not take into account the congeneric nature of the model i.e. they assume either a tau equivalent or parallel model where a base assumption is that factor loadings are considered equal. Traditional approaches will consistently underestimate both reliability and validity measures. The degree of the mismatch is dependent on how close the congeneric model approaches either the tau equivalent or parallel model constraints.

Four measures of reliability will be reported; squared multiple correlations (SMC), construct reliability, variance extracted and coefficient H.

The SMC for an indicator variable represents the proportion of variance in the indicator variable that is being explained by the factor. This is not to be confused with the squared multiple correlation ($\rho_{i\xi}$) referred to in classical measurement theory. SMC refers to the relation between the indicator variable and the factor while $\rho_{i\xi}$ refers to the relationship between the item and all items in the scale. For a factor to be considered a good mapping to the indicator variable the SMC for that variable should be greater than .5 while a SMC greater than .3 is considered acceptable (Joreskog & Sorbom, 1989). The SMCs for the indicator variables mapped by the High Expectations model were LSHE1 (.842), LSHE2 (.884), LSHE3 (.755), LSHE4 (.766), LSHE5 (.825), LSHE6 (.831), and LSHE7 (.709). All items were above the "good" cut-off (Fornell & Larcker, 1981). In summary the High Expectations model is explaining between 71% and 88% of the variance across the individual indicator variables.

The variance extracted expresses the overall amount of variance in the indicators accounted for by the factor and is a commonly reported measure of reliability. As a general rule the variance extracted should exceed .5 (Fornell & Larcker, 1981). The variance extracted from the indicators by the High Expectations model was .81 for the promotion factor and .80 for the enactment factor. In other words the factors are accounting for 80-81% of the variation in their respective indicator variables which is well above the recommended cut off of 50%.

Construct reliability measures the internal consistency of a set of indicators. Unlike Cronbach alpha it is based on estimates of model parameters and does not assume a parallel equivalent model. Similar to the variance extracted measure the accepted cut off is .5 (Fornell & Larcker, 1981). The construct reliability for the High Expectations model is .93 for the promotion factor and .94 for the enactment factor; well above the recommended cut off.

Coefficient H (Hancock & Mueller, 2001) is becoming a popular way of reporting model reliability as it can cope with negative factor loadings and takes into account the contributions of all variables regardless of how small the contribution. Consequently the coefficient will always be larger than the item reliability of the single best indicator variable which is conceptually reassuring. It can be regarded as the squared correlation between a factor and the optimum linear composite formed by the indicators and as such could be considered as an upper limit measure of reliability. The coefficient H value for the High Expectations model was .93 for the promotion factor and .95 for the enactment factor, which represents a high reliability (Hancock & Mueller) and is in line with previous measures calculated.

In a congeneric measurement model for the model to be accepted the indicator variables contributing to the overall measurement of the latent variable must all be of the same dimensionality therefore the goodness of fit measures can be viewed as confirming construct validity. The High Expectations model fitted well as confirmed by the non significant χ^2 supporting the claim for construct validity.

Convergent validity is another measure of how well the latent factor maps the indicator variables. It is a measure of the direct structural relationship between an indicator variable and the latent construct and is operationalised through the factor loading. To achieve convergent validity the factor loadings must be significantly different from zero. The critical ratio of the parameter estimates is used to test this significance. The critical ratios for the indicator variables were LSHE1 (12.407), LSHE2 (12.875), LSHE3 (11.271), LSHE4 (11.404), LSHE5 (12.186), LSHE6 (12.264), and LSHE7 (10.747) all of which are significant at the .05 level which support a claim for convergent validity. It is also sometimes recommended that all factor loadings should be above .7 as this corresponds to an item reliability of .5. The factor loadings for all items mapped by High Expectations were above .7 reinforcing the claim for convergent validity.

Index score

Two scale scores that take into account individual and joint measurement error was then computed as a continuous variable by multiplying the individual's raw score on each indicator by the proportionally weighted regression coefficient of each indicator and summing.

Table 173 **High Expectations Regression Weight**

High Expectations Leadership and Promotion	HE1	HE2	HE3	HE4	HE5	HE6	HE7
Raw Regression Weights	0.008	0.406	0.196	0.173	0.063	0.069	0.033
Proportional Regression Weights	0.078	0.398	0.192	0.170	0.062	0.068	0.032

High Expectations Enactment	HE1	HE2	HE3	HE4	HE5	HE6	HE7
Raw Regression Weights	0.241	0.088	0.043	0.038	0.192	0.209	0.101
Proportional Regression Weights	0.264	0.096	0.047	0.042	0.211	0.229	0.111

The scale scores then become:

High Expectations Leadership and Promotion = (LSHE1*.078) + (LSHE2*.398) + (LSHE3*.192) + (LSHE4*.170) + (LSHE5*.062) + (LSHE6*.068) + (LSHE7*.032)

High Expectations Expectations = (LSHE1*.264) + (LSHE2*.096) + (LSHE3*.047) + (LSHE4*.042) + (LSHE5*.211) + (LSHE6*.229) + (LSHE7*.111)

This approach ensures the estimates of the scale score adjusted for measurement error is proportionally weighted by the actual contribution made by each indicator. The proportional regression weight (refer Table 173) scores sum to one hence the composite score will range from a minimum of 1 to a maximum of 9. This process ensures the construct will have the same ‘metric’ as that of indicators for the construct.

Appendix 3.3 Leader Pedagogy And Curriculum Cultural Knowledge PCA

Table 174 **Leaders Survey Description**

SPSS name	Description
LSPED1	8.1. Indigenous students require strong lesson scaffolding and direct instruction.
LSPED2	8.3. Indigenous students require a pre-planned step-by-step approach to learning.
LSPED3	8.4. Practical, hands-on lessons (e.g., vocational and technical tasks) are the most effective strategies for engaging Indigenous students.
LSPED4	8.5. Effective teaching of Indigenous students requires a strong focus on classroom management and rules.
LSPED5	8.6. Indigenous students negotiate their movement and use of space in the classroom (e.g., learning stations, group work).
LSPED6	8.7. A comprehensive, packaged approach to teaching and learning is used for Indigenous students (e.g., Jolly Phonics, Letter Land, Multi Lit, Go Maths).
LSPED7	8.8. There is provision in the curriculum for Indigenous students to learn from community elders.
LSPED8	8.10. Indigenous students are allowed to choose topics and curriculum content in their learning.
LSPED9	8.11. Indigenous students receive individually tailored instruction.
LSPED10	8.12. Indigenous students negotiate their learning tasks (e.g., topics, due dates, criteria).
LSPED11	8.13. Indigenous students often explore issues of identity and their 'voice'.
LSPED12	8.14. The approaches to teaching reflect Indigenous communication styles (e.g., family interaction patterns, ways of addressing elders, behaviour management strategies).
LSPED13	8.15. There is a strong focus for Indigenous learners on real world knowledge (e.g., how to deal with institutions, how to access services, using media).
LSPED14	8.16. Indigenous students require a strong emphasis on the Key Learning Areas to achieve successful learning.
LSPED15	8.17. The core school curriculum strongly focuses on basic skills of literacy.
LSPED16	8.18. The core school curriculum strongly focuses on basic skills of numeracy.
LSPED17	8.19. It is essential that Indigenous students engage with traditional Western literary and historical knowledge (e.g., literary 'classics', Greek and Roman myths).
LSPED18	8.20. It is essential that Indigenous students engage with high status Western mathematical and scientific knowledge (e.g., Physics, Chemistry, Advanced Mathematics).

LSPED19	8.21. It is essential that Indigenous students master spoken and written Standard Australian English.
LSPED20	8.22. The integration of community knowledges and issues into the classroom is prominent.
LSPED21	8.23. There is a strong emphasis on local Indigenous knowledges in the curriculum (e.g., local history, cultural practices, Aboriginal terms and locations).
LSPED22	8.24. There is provision for specialised instruction in elements of Indigenous cultural, artistic and musical expression.
LSPED23	8.25. There is provision for teaching Indigenous languages.
LSPED24	8.26. There is provision for Aboriginal English and Torres Strait Islander Kriol/ Creole to be spoken in classrooms.
LSPED25	8.27. Involvement in workplace and community service is an important part of curriculum for Indigenous students at this school.
LSPED26	8.28. Indigenous students are exposed to career education.
LSPED27	8.29. Exposure to mainstream classics of children’s literature is important for Indigenous students (e.g., Roald Dahl, C. S. Lewis, E. B. White).

Descriptives:

Table 175 Descriptives

	N	Missing	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	%	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
LSPED1	87	25.0	1.00	9.00	6.1494	.21661	2.02041	-.460	.258	-.267	.511
LSPED2	87	25.0	1.00	9.00	5.3218	.25036	2.33524	-.237	.258	-.785	.511
LSPED3	87	25.0	1.00	9.00	5.6552	.22762	2.12312	-.333	.258	-.190	.511
LSPED4	87	25.0	1.00	9.00	5.4828	.26101	2.43455	-.152	.258	-.999	.511
LSPED5	87	25.0	1.00	9.00	4.1494	.26692	2.48965	.367	.258	-.810	.511
LSPED6	86	25.9	1.00	9.00	4.5814	.25219	2.33875	.307	.260	-.777	.514
LSPED7	87	25.0	1.00	9.00	4.4253	.25520	2.38031	.151	.258	-1.083	.511
LSPED8	87	25.0	1.00	9.00	3.5057	.22999	2.14516	.603	.258	-.370	.511
LSPED9	87	25.0	1.00	9.00	4.7126	.25534	2.38165	.091	.258	-.950	.511
LSPED10	87	25.0	1.00	8.00	2.7471	.19972	1.86285	.810	.258	-.426	.511
LSPED11	87	25.0	1.00	9.00	3.9655	.23548	2.19645	.335	.258	-.891	.511
LSPED12	86	25.9	1.00	8.00	3.7326	.23994	2.22512	.293	.260	-1.190	.514
LSPED13	87	25.0	1.00	9.00	4.4253	.24395	2.27541	.275	.258	-.706	.511
LSPED14	87	25.0	1.00	9.00	5.9655	.24440	2.27958	-.602	.258	-.342	.511
LSPED15	87	25.0	1.00	9.00	6.9310	.18982	1.77051	-1.141	.258	1.713	.511
LSPED16	87	25.0	1.00	9.00	6.4253	.22155	2.06652	-.769	.258	.086	.511
LSPED17	87	25.0	1.00	9.00	4.0805	.27222	2.53908	.331	.258	-1.073	.511
LSPED18	87	25.0	1.00	9.00	4.4713	.24841	2.31697	-.095	.258	-.880	.511
LSPED19	87	25.0	1.00	9.00	6.8506	.22803	2.12695	-1.180	.258	.962	.511
LSPED20	86	25.0	1.00	9.00	4.7558	.23679	2.19591	.087	.260	-.668	.514
LSPED21	87	25.0	1.00	9.00	5.0345	.23320	2.17517	-.135	.258	-.848	.511
LSPED22	87	25.0	1.00	9.00	4.8851	.26435	2.46570	.121	.258	-1.079	.511
LSPED23	86	25.9	1.00	9.00	2.3837	.28418	2.63536	1.680	.260	1.188	.514
LSPED24	85	26.7	1.00	9.00	2.4471	.27830	2.56583	1.613	.261	1.173	.517
LSPED25	86	25.9	1.00	9.00	3.5698	.28771	2.66807	.670	.260	-.783	.514
LSPED26	86	25.9	1.00	9.00	4.7442	.31173	2.89090	-.041	.260	-1.442	.514
LSPED27	87	25.0	1.00	9.00	5.6207	.24646	2.29884	-.420	.258	-.585	.511
Valid N (listwise)	82										

The minimum and maximum values for each variable lie in the scale range of 1-9 respectively indicating the absence of outliers that could arise from data entry problems. The mean scale scores (refer Table 175) on each variable ranged from 2.38 to 6.93 on a 9 point scale. The mean is skewed towards the low end of the scale as the mode on all items was a response of "1 – not much". This has implications for conducting statistical analysis that rely on normal distributions of responses. However standard deviations are around 2.5 suggesting range of response is adequate.

Missing value analysis indicated that 85-87 out of a total of 116 cases were complete with respect to the item list. The remaining 29-31 cases are not missing at random. It would appear that these cases did not complete any items in the item list – perhaps due to response fatigue. These cases were deleted from the data set.

A principal components analysis was employed to reduce the number of items to a manageable number of components for subsequent analysis. Exploratory and confirmatory factor analysis was not used for the pedagogy items given that substantive theory in this area already exists.

Principal components analysis has a requirement that the data is continuous and of interval level of measurement. While it is recognised the Likert scale used is technically an ordinal scale, in this context it is treated as being of interval level of measurement which is line with common practice in educational research (Lehman, 1991).

The greater the number of points on an ordinal scale, the less the likelihood of substantive errors of interpretation when using ordinal data for interval procedures (Binder, 1984; Zumbo & Zimmerman, 1993) . As this instrument employs a 9 point scale subsequent analysis was conducted assuming interval level of measurement

Close to zero levels of skewness and kurtosis is a useful indicator of the degree of normality associated with the data distribution. West, Finch and Curran (1995) recommend that absolute values of skewness and kurtosis exceeding 2 and 7 respectively were reasons for concern. The sample statistics are well within these bounds but a visual analysis of the histograms and P-P plots would indicate some important departures from normality with all variables.

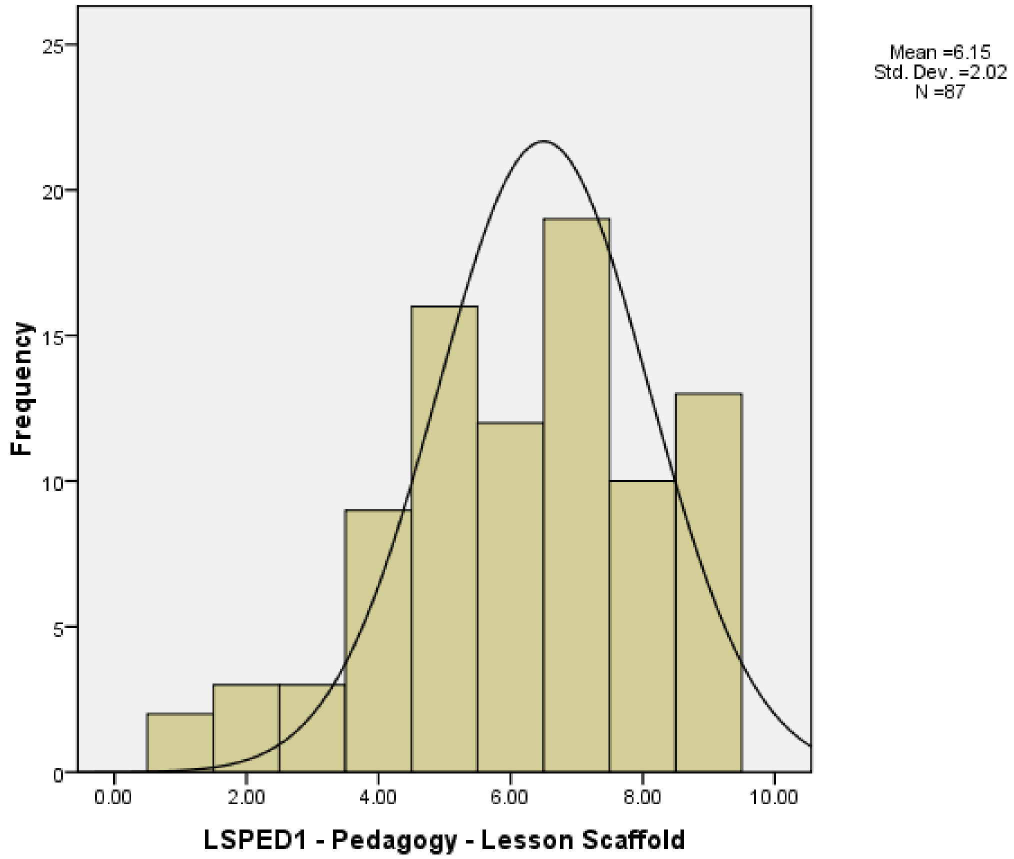

Figure 232 **Histogram LSPED1**

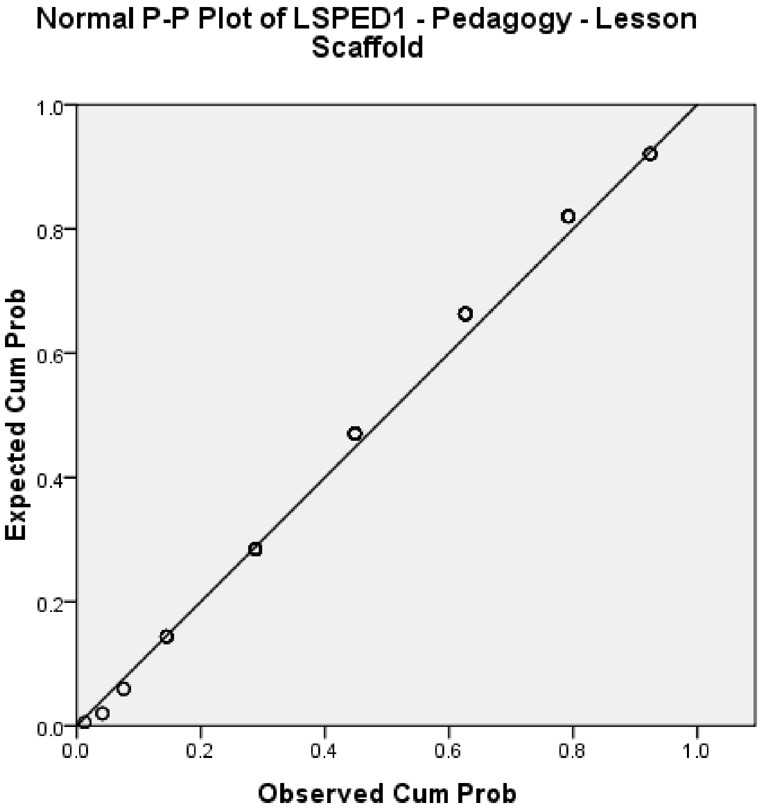

Figure 233 **P-P Plot LSPED1**

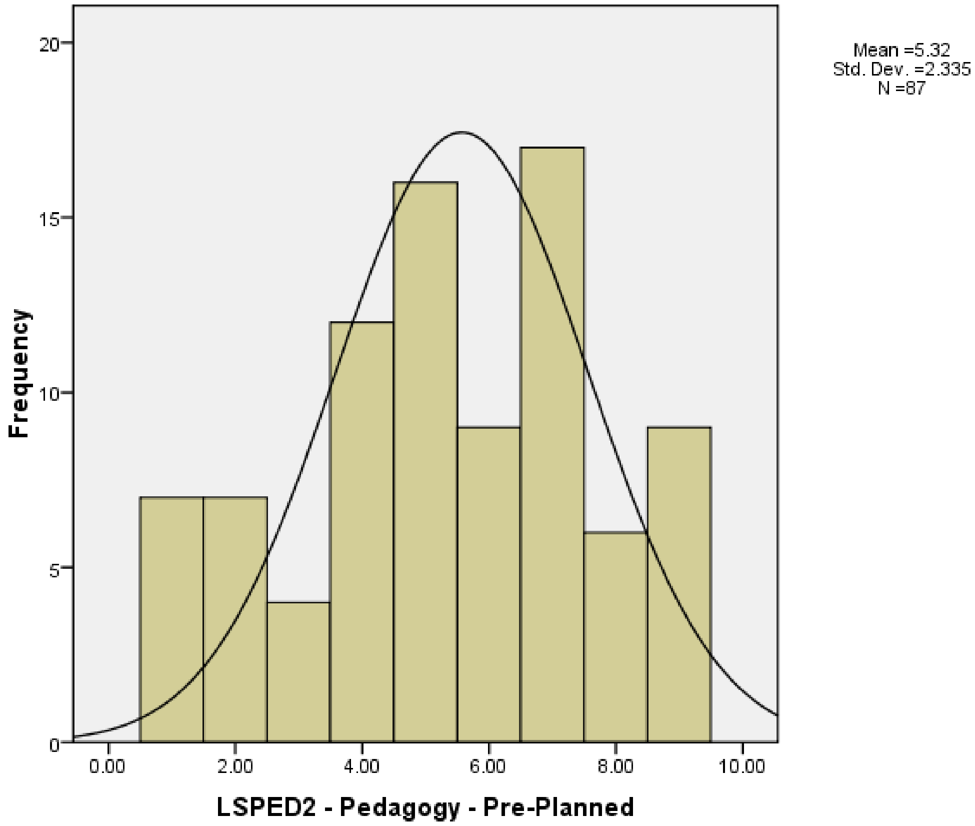

Figure 234 **Histogram LSPED2**

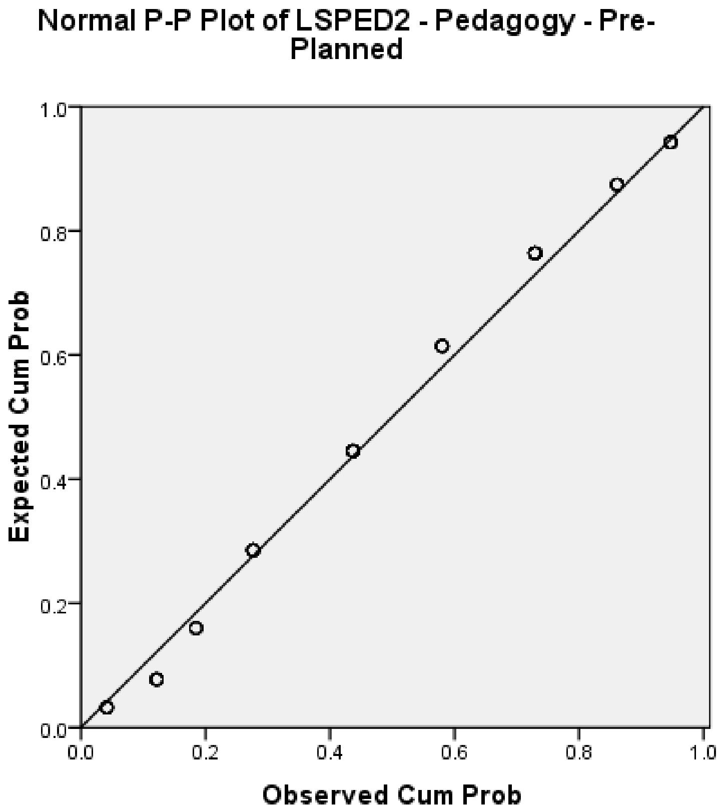

Figure 235 **P-P Plot LSPED2**

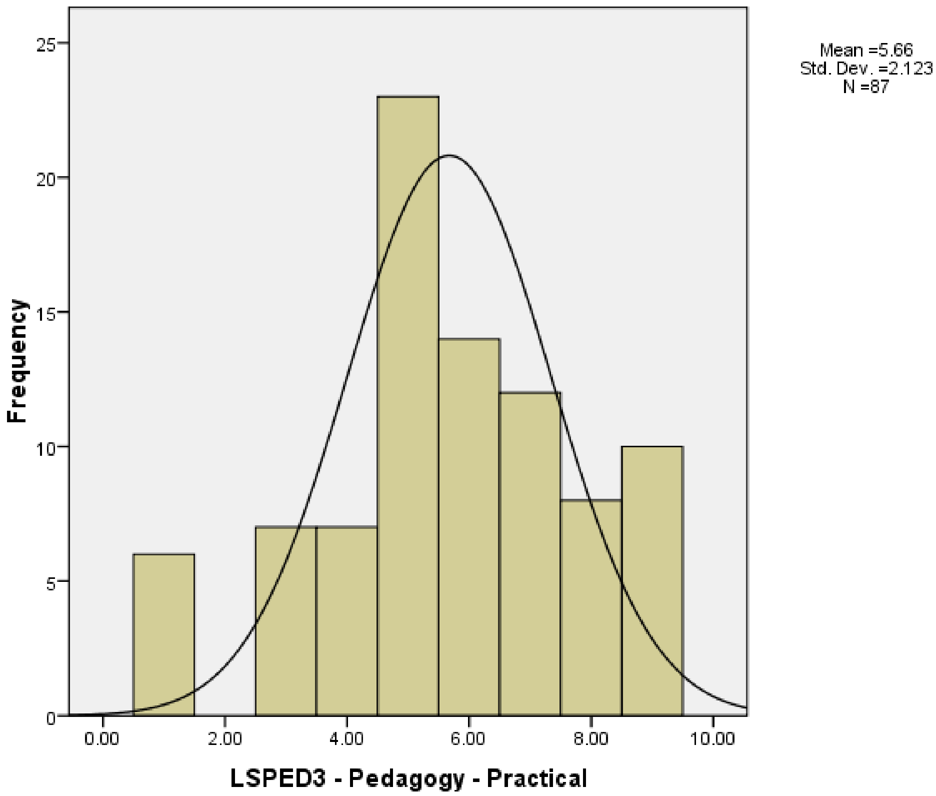

Figure 236 **Histogram LSPED3**

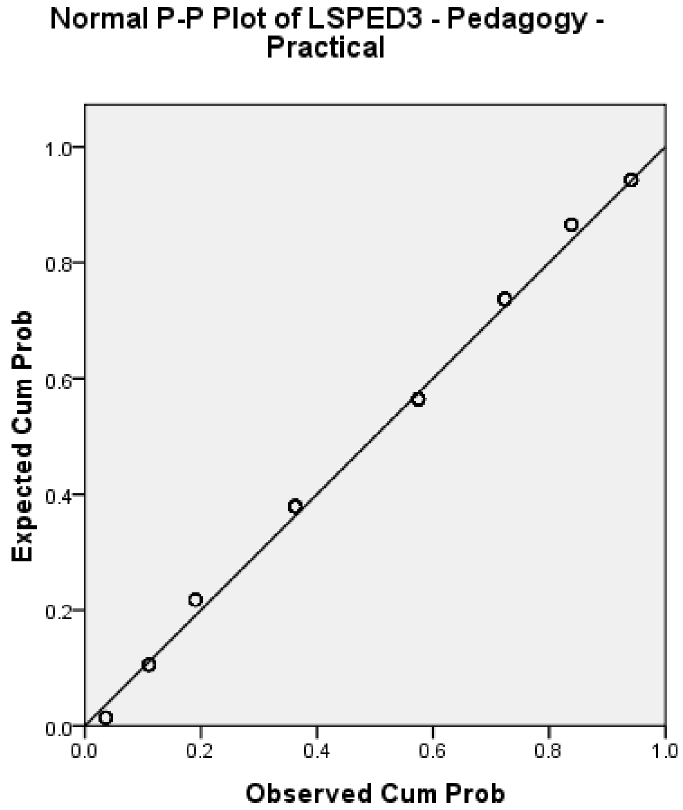

Figure 237 **P-P Plot LSPED3**

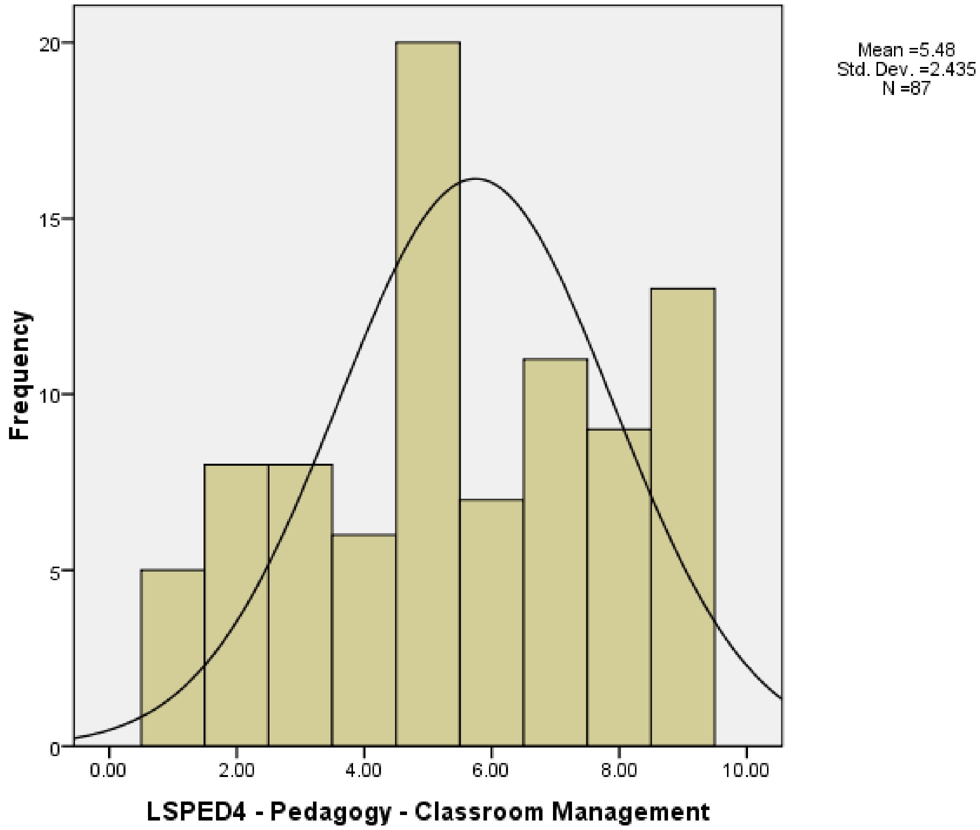

Figure 238 **Histogram LSPED4**

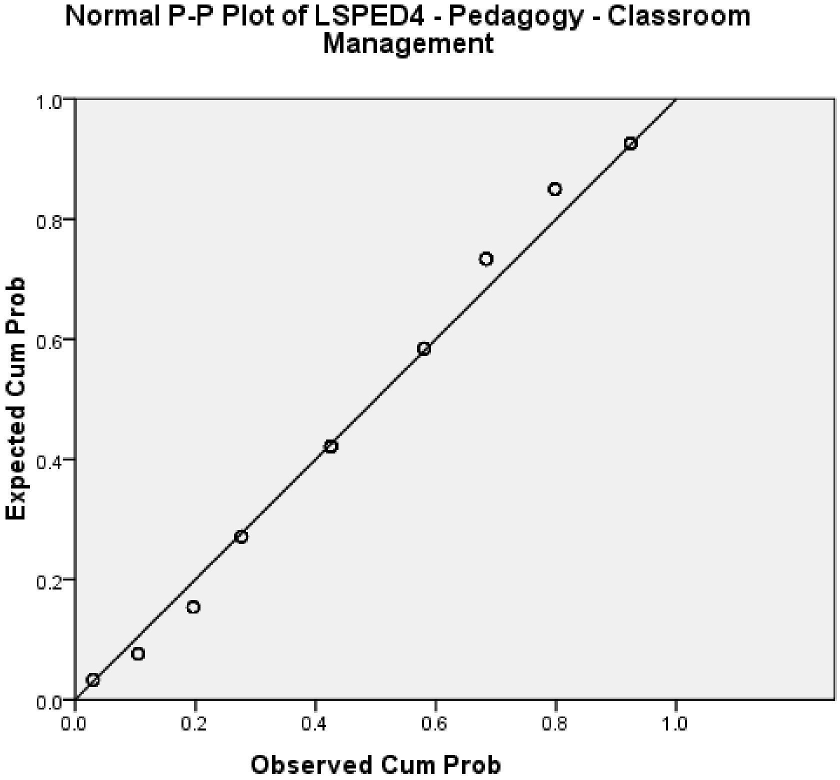

Figure 239 **P-P Plot LSPED4**

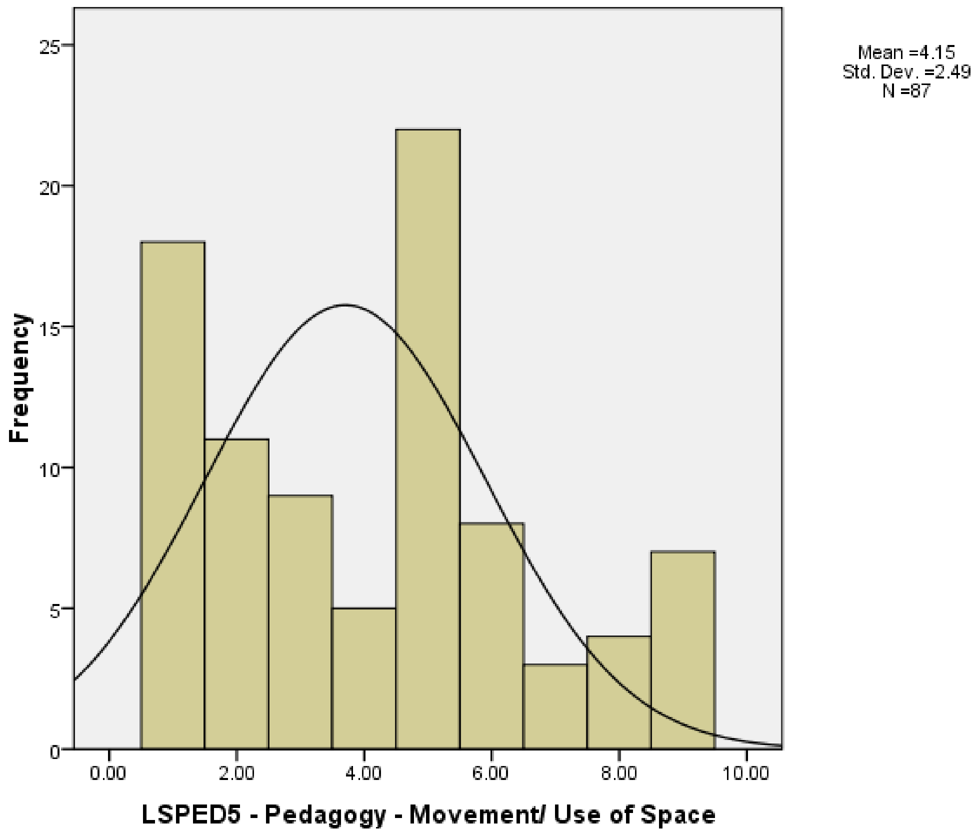

Figure 240 Histogram LSPED5

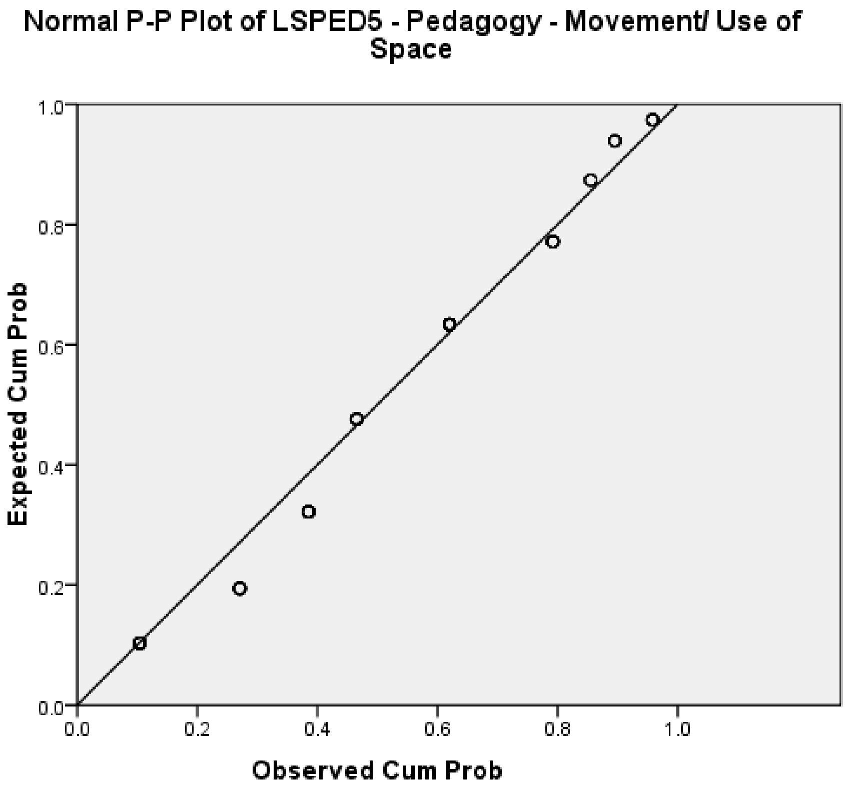

Figure 241 P-P Plot LSPED5

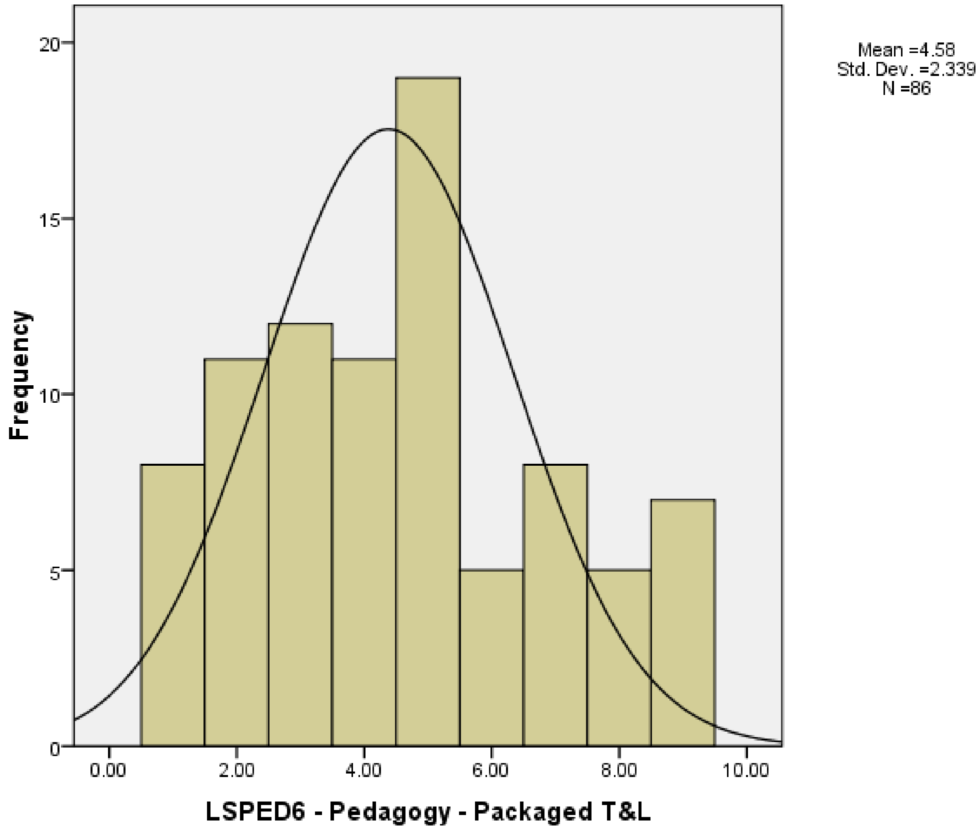

Figure 242 **Histogram LSPED6**

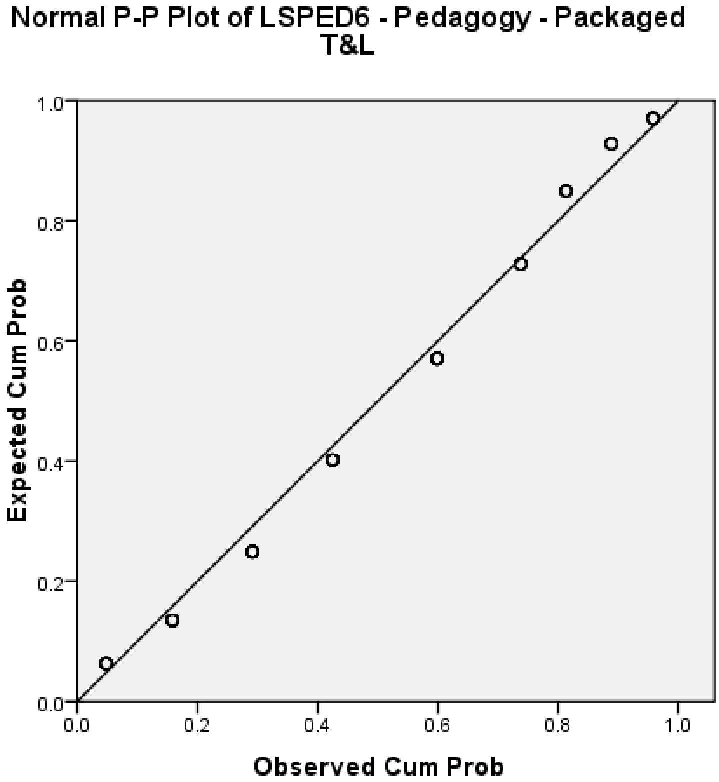

Figure 243 **P-P Plot LSPED6**

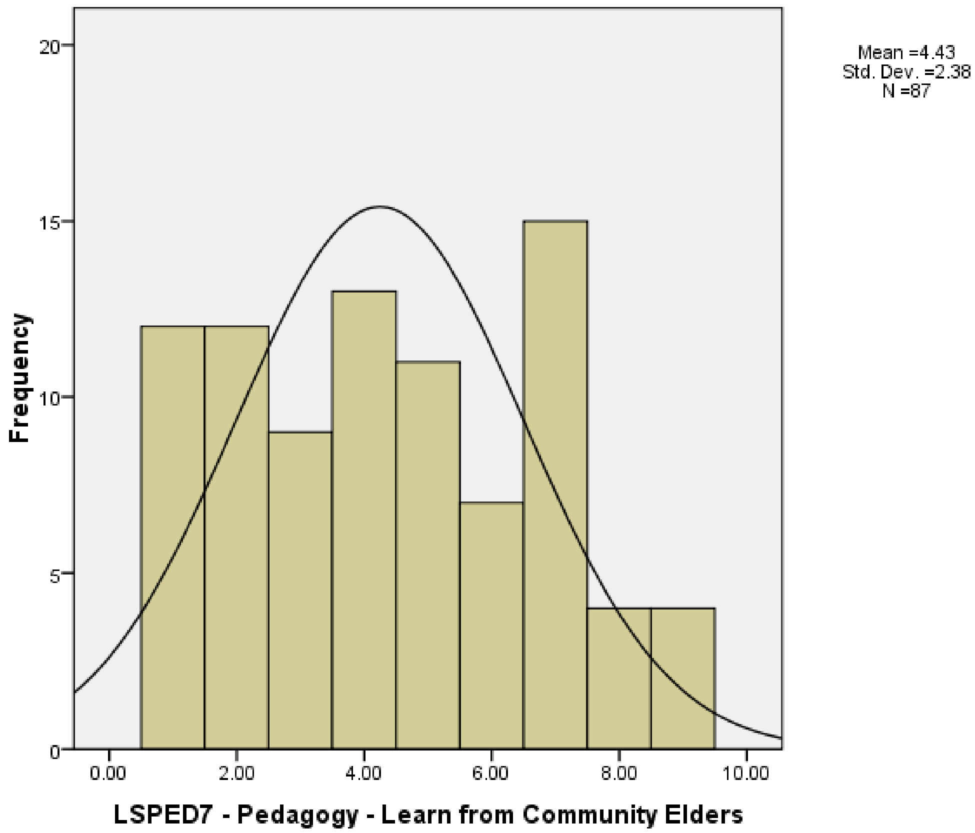

Figure 244 **Histogram LSPED7**

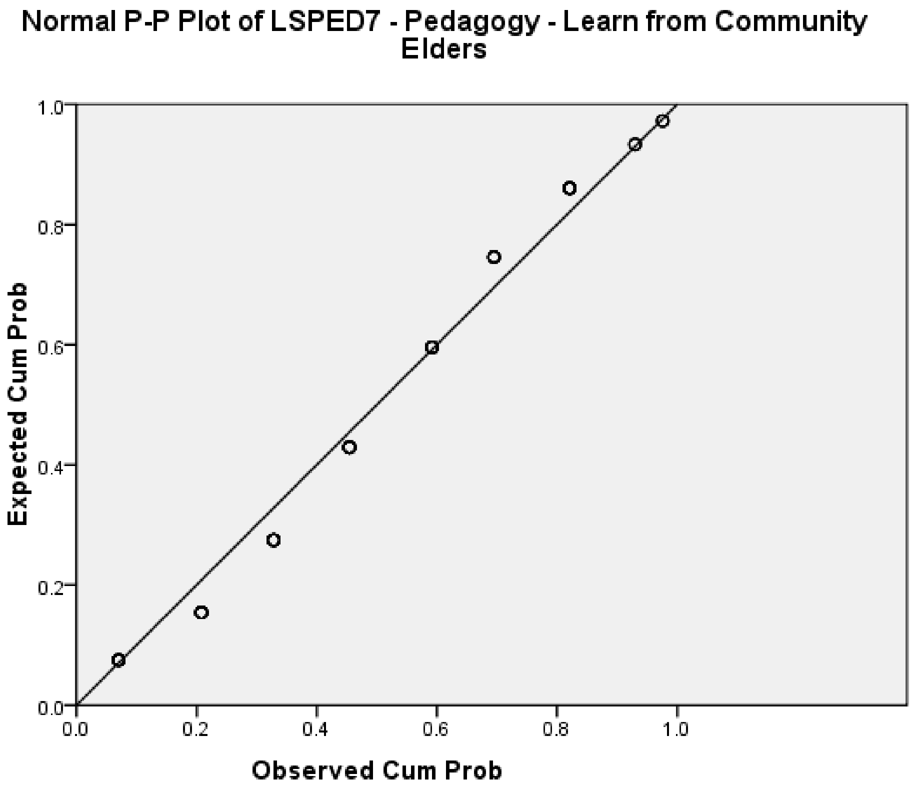

Figure 245 **P-P Plot LSPED7**

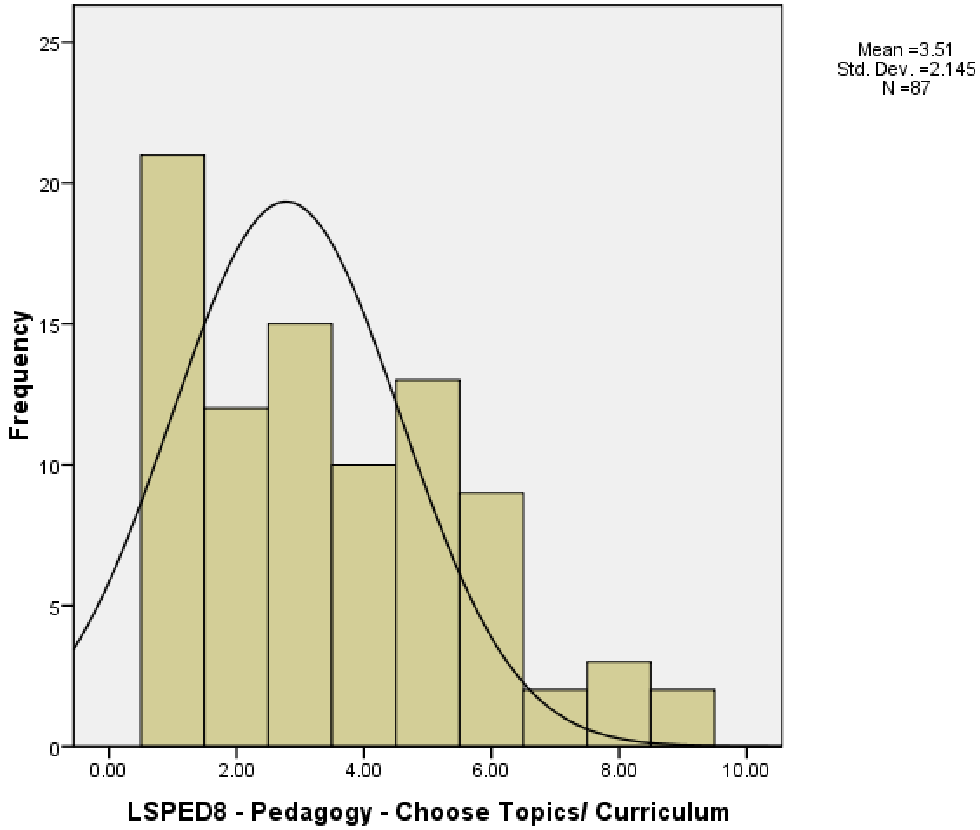

Figure 246 **Histogram LSPED8**

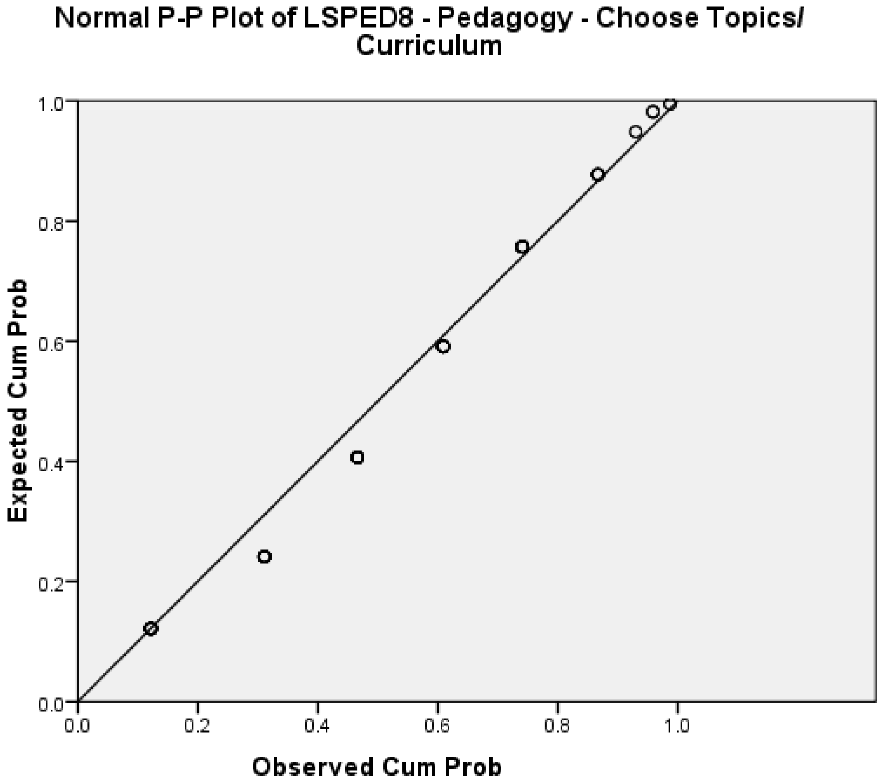

Figure 247 **P-P Plot LSPED8**

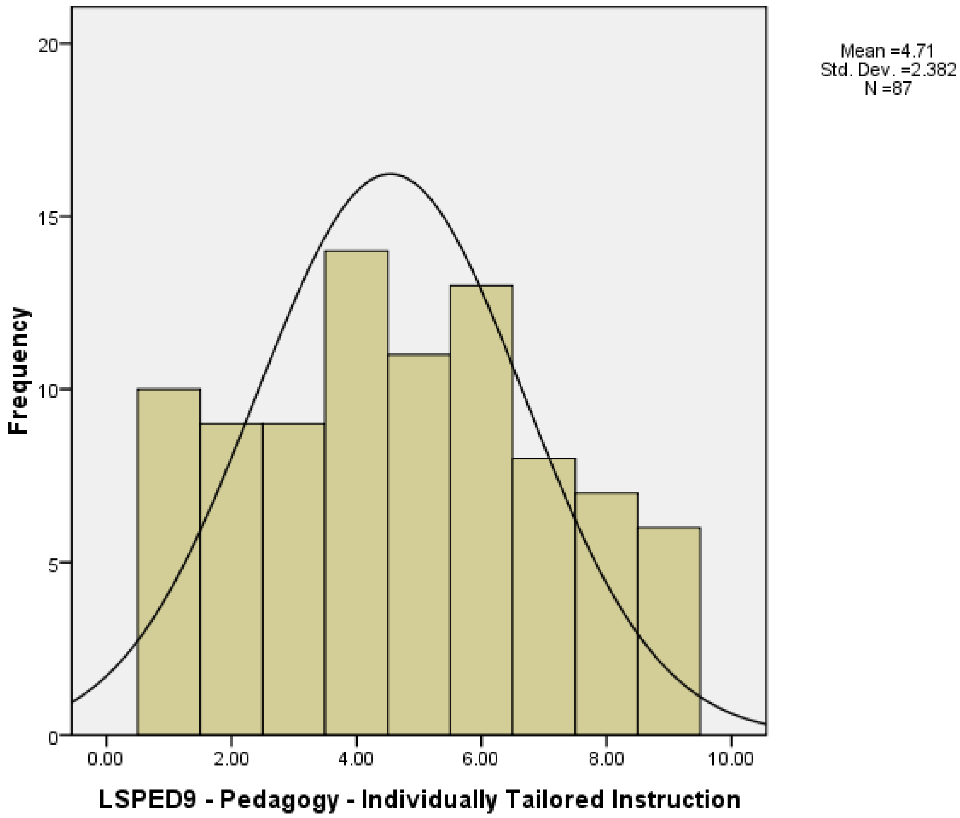

Figure 248 **Histogram LSPED9**

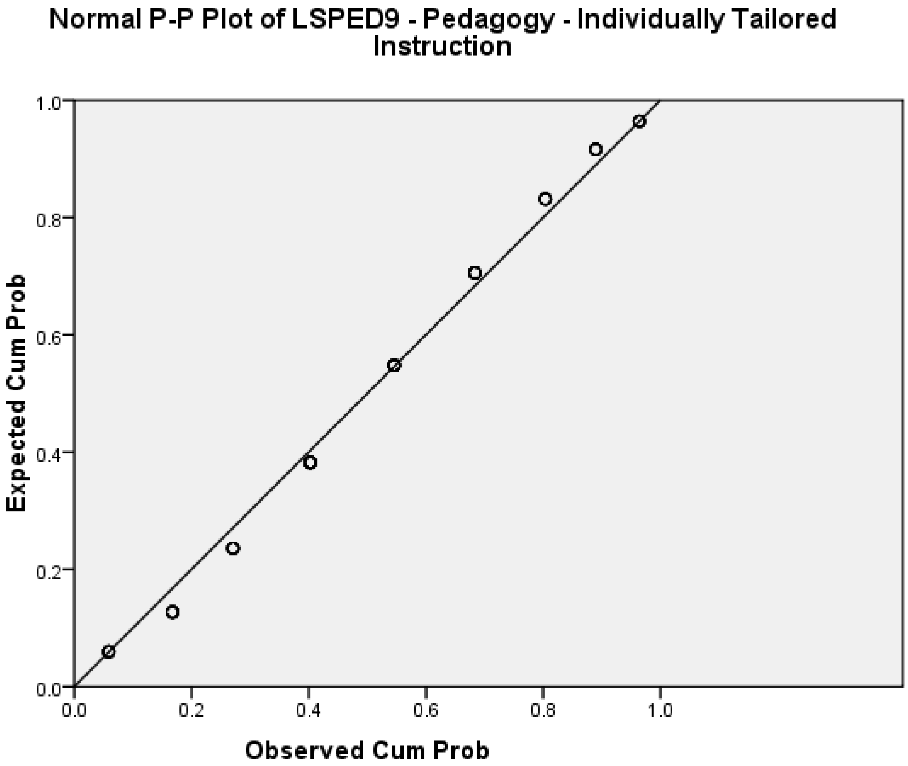

Figure 249 **P-P Plot LSPED9**

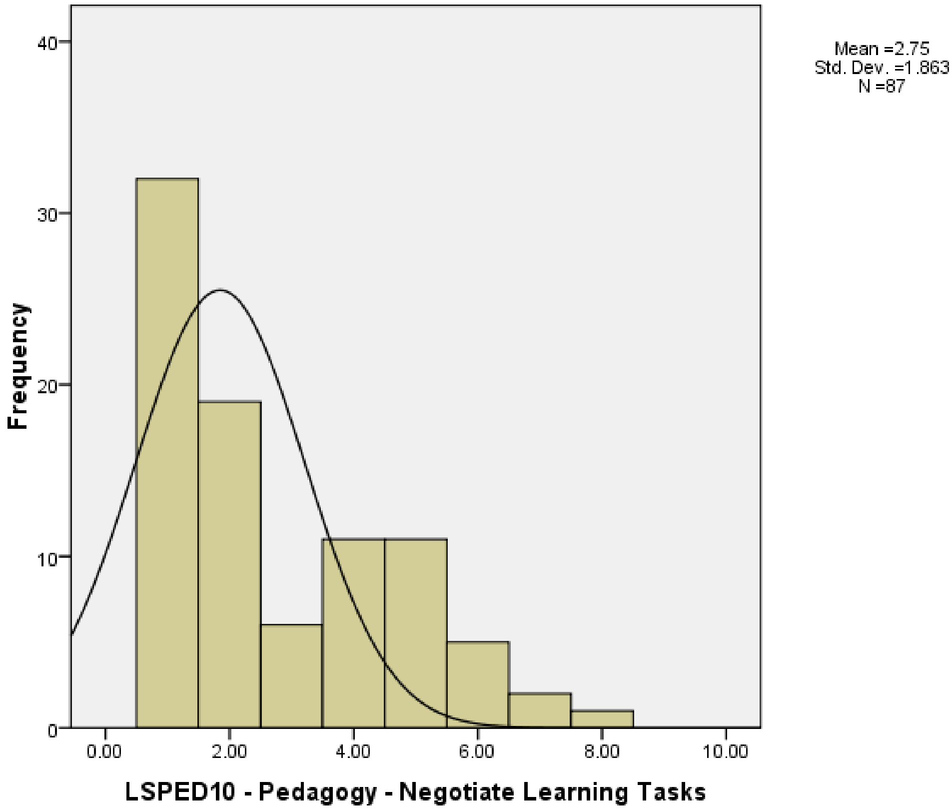

Figure 250 **Histogram LSPED10**

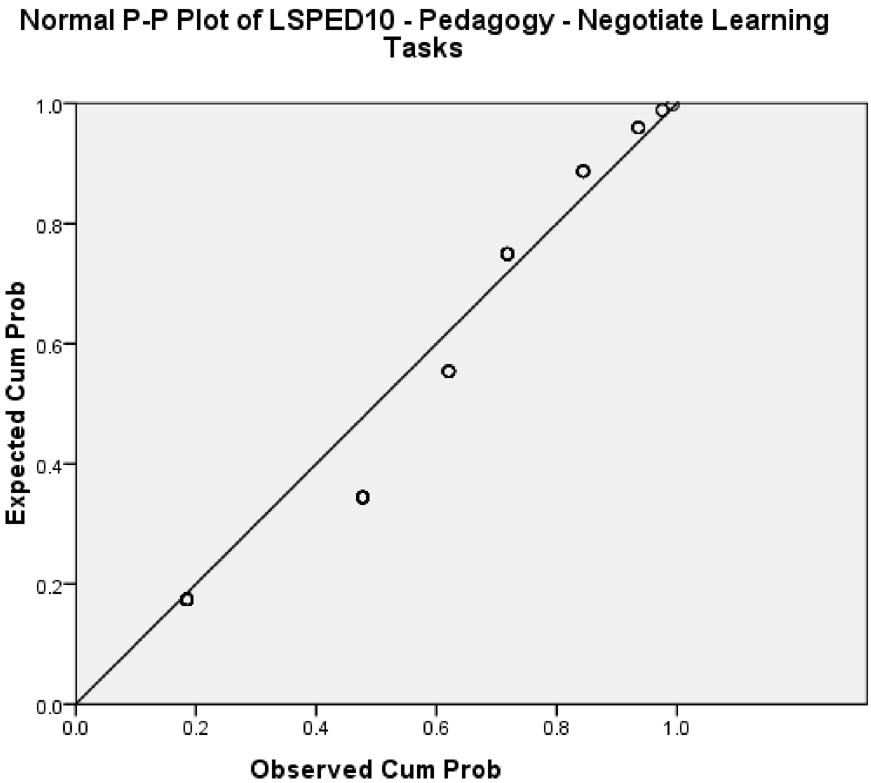

Figure 251 **P-P Plot LSPED10**

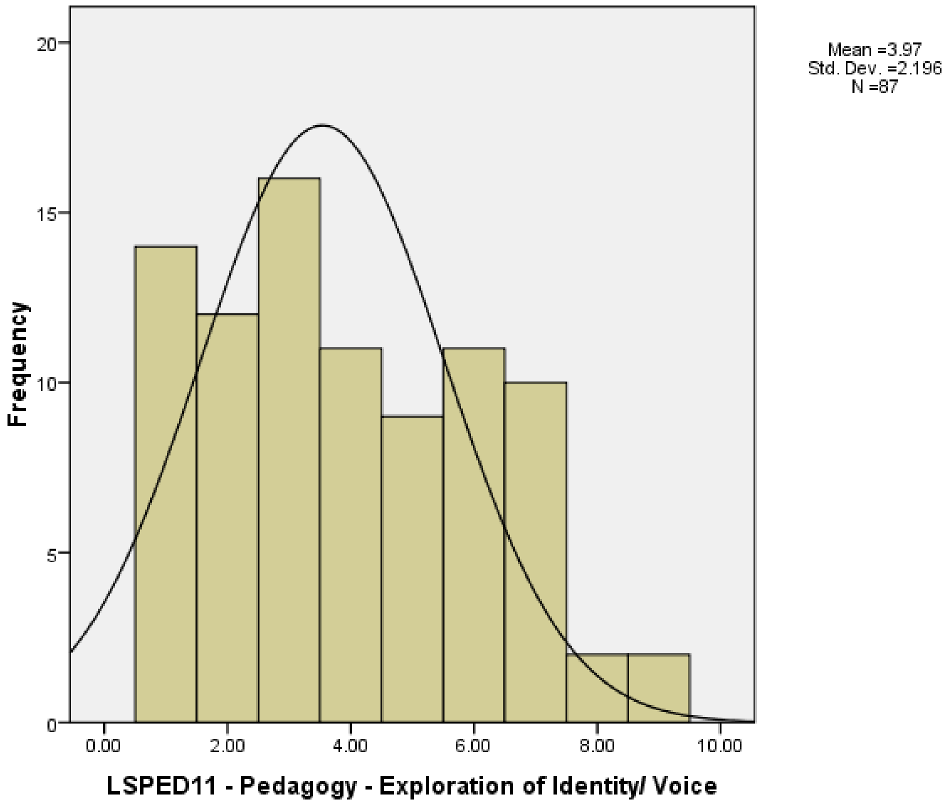

Figure 252 **Histogram LSPED11**

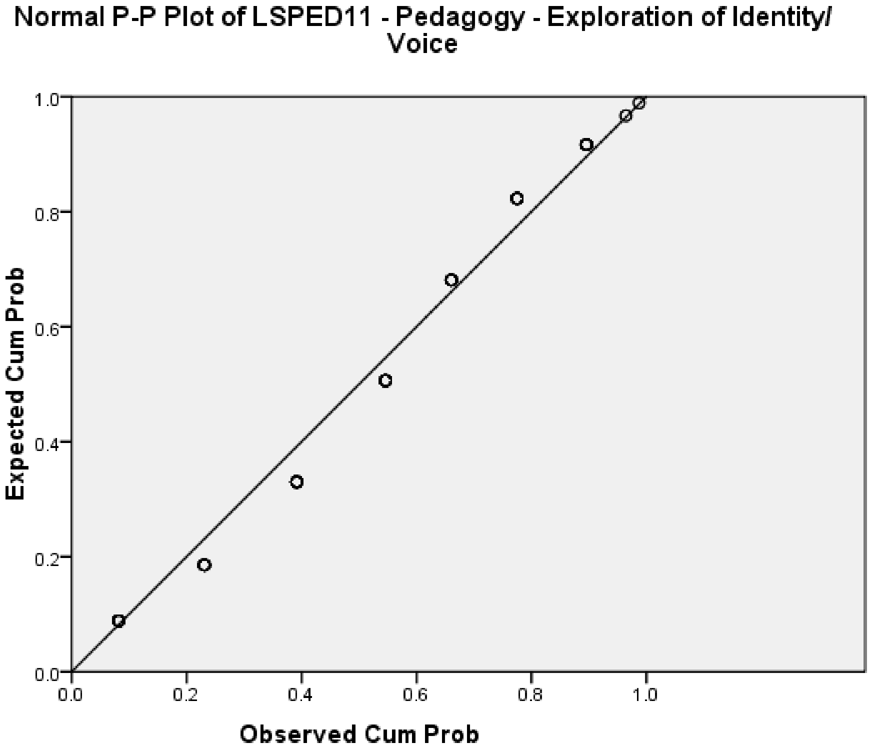

Figure 253 **P-P Plot LSPED11**

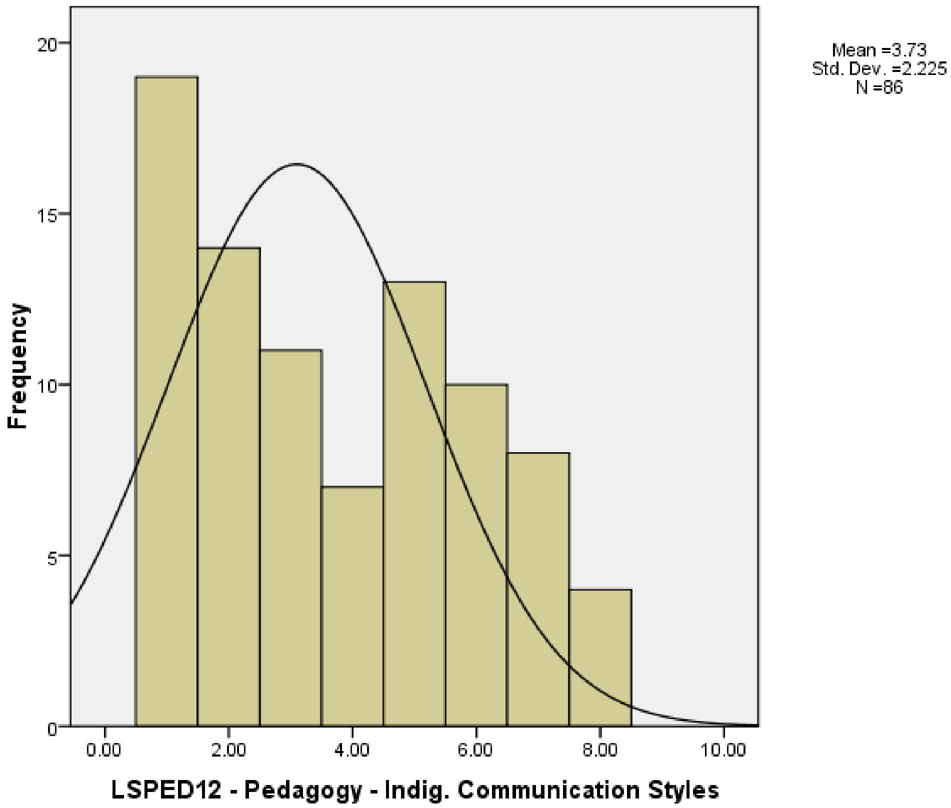

Figure 254 **Histogram LSPED12**

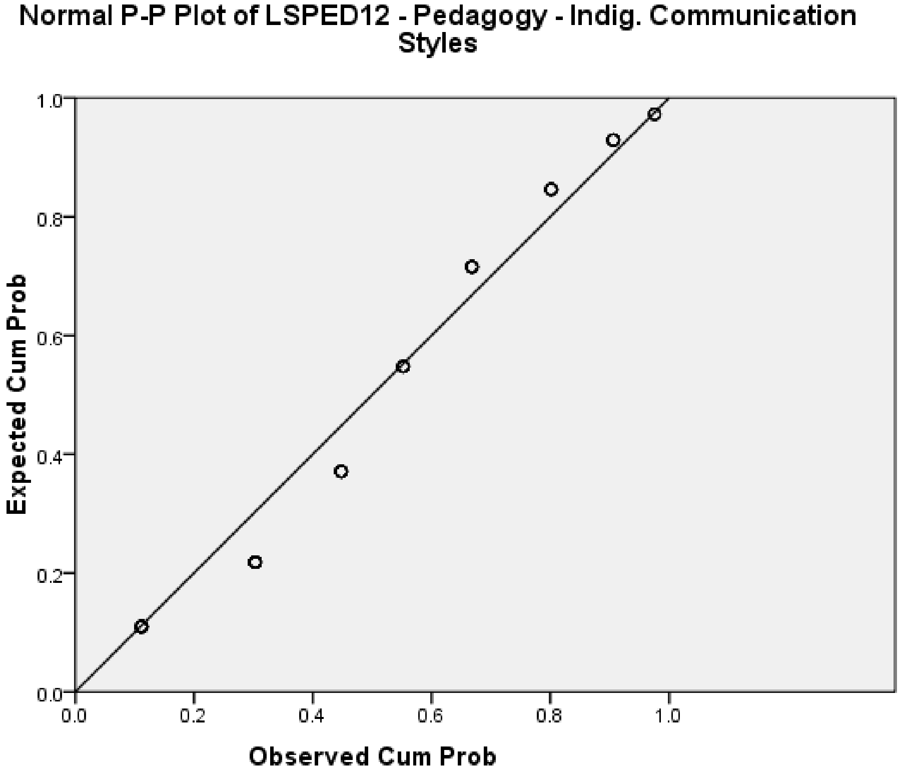

Figure 255 **P-P Plot LSPED12**

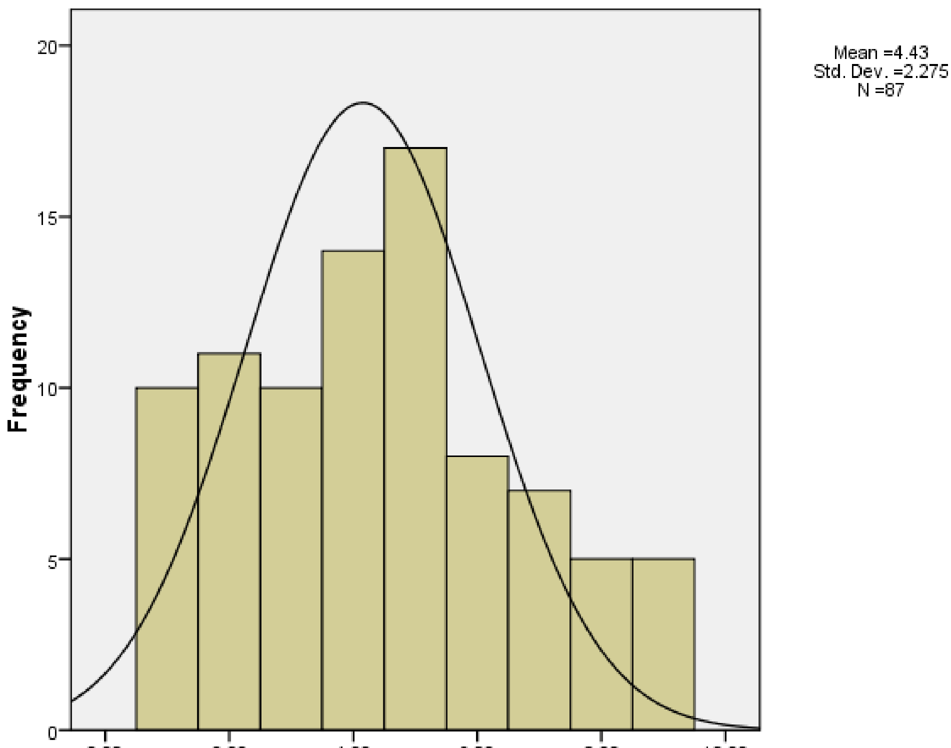

Figure 256 **Histogram LSPED13**

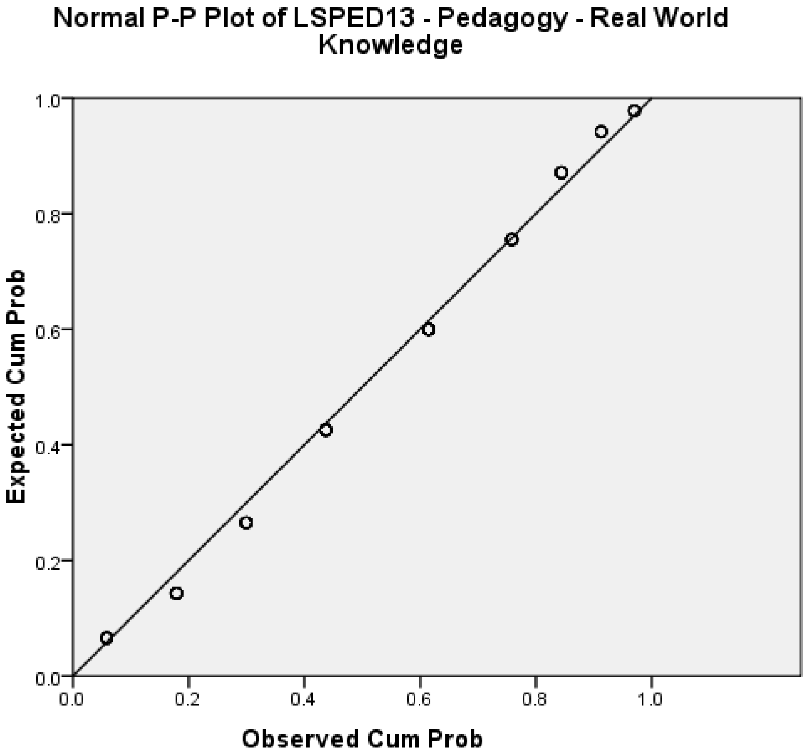

Figure 257 **P-P Plot LSPED13**

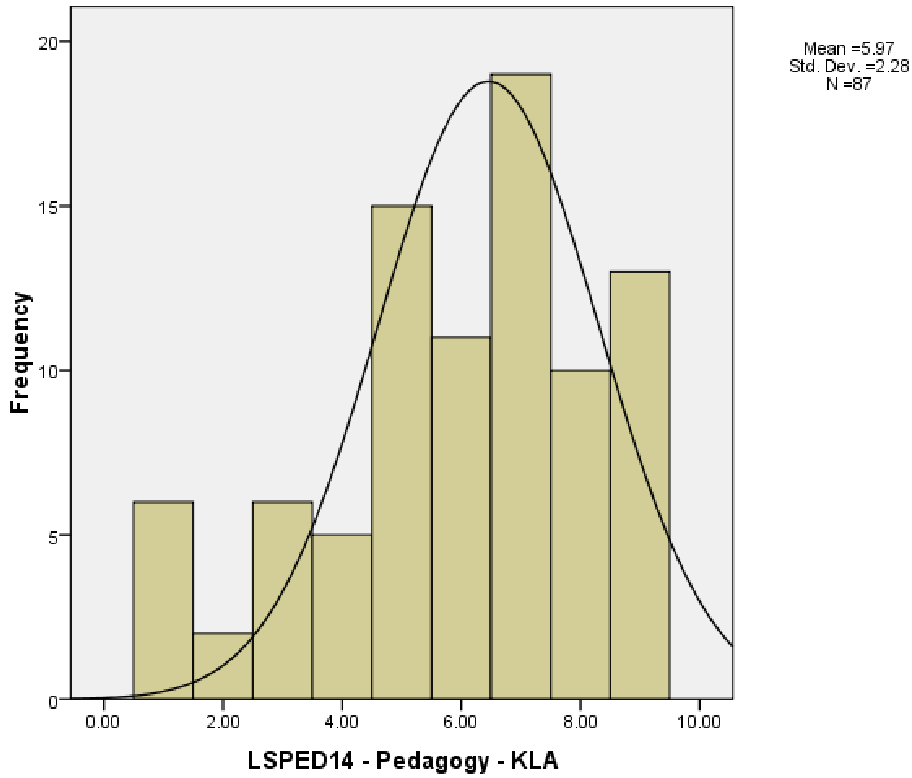

Figure 258 **Histogram LSPED14**

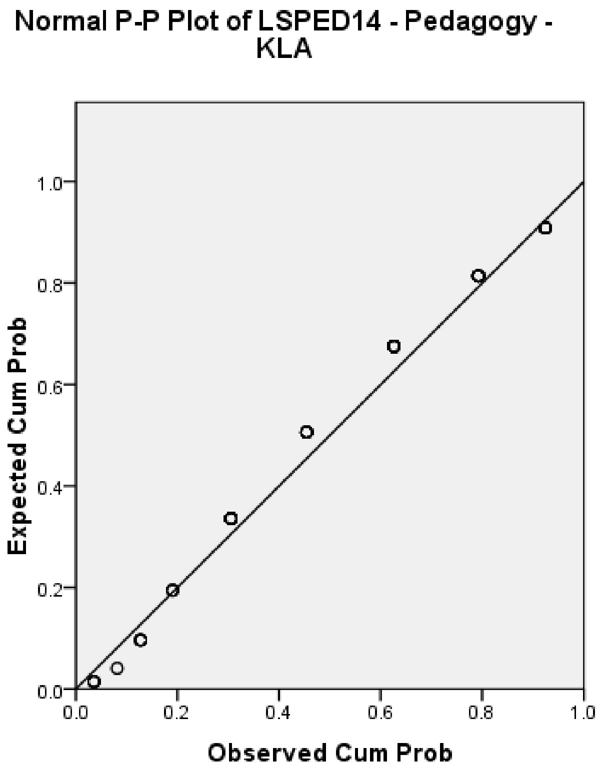

Figure 259 **P-P Plot LSPED14**

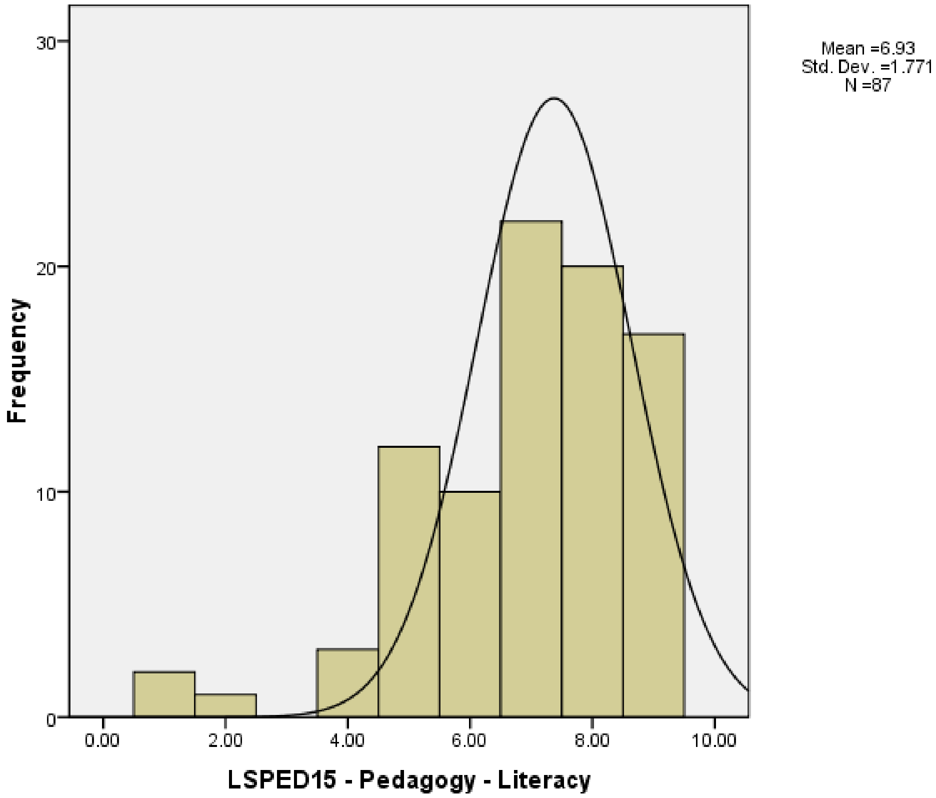

Figure 260 **Histogram LSPED15**

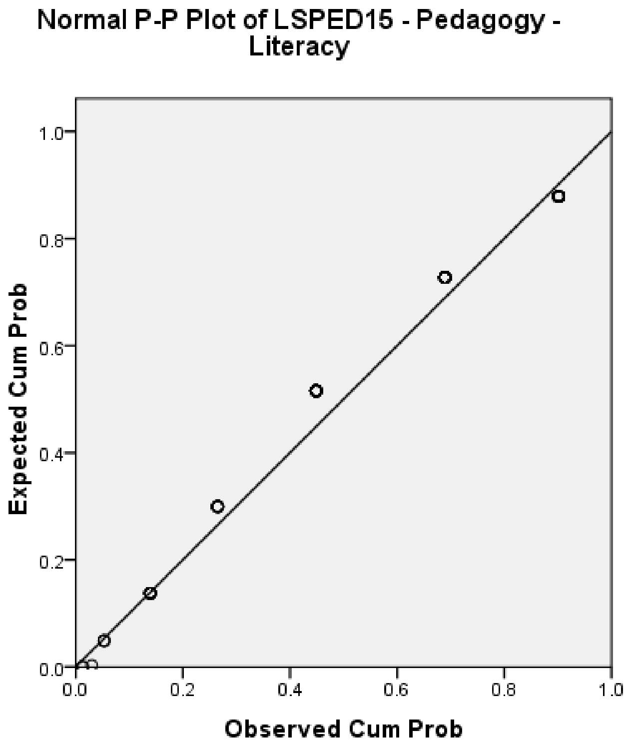

Figure 261 P-P Plot LSPED15

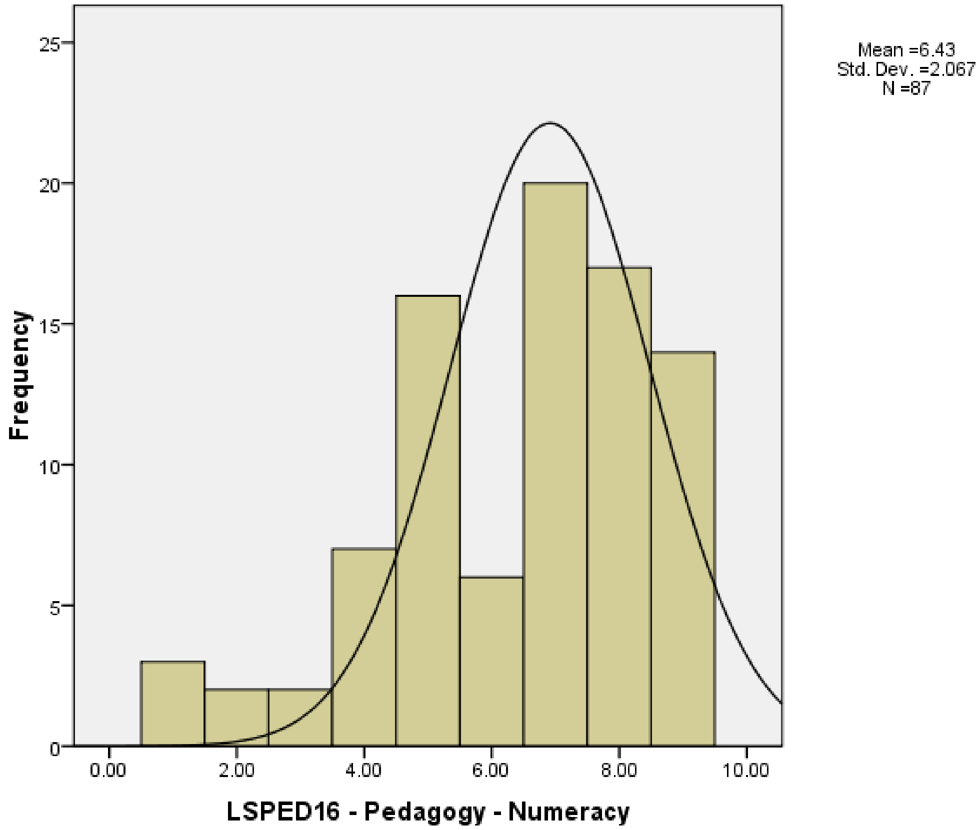

Figure 262 Histogram LSPED16

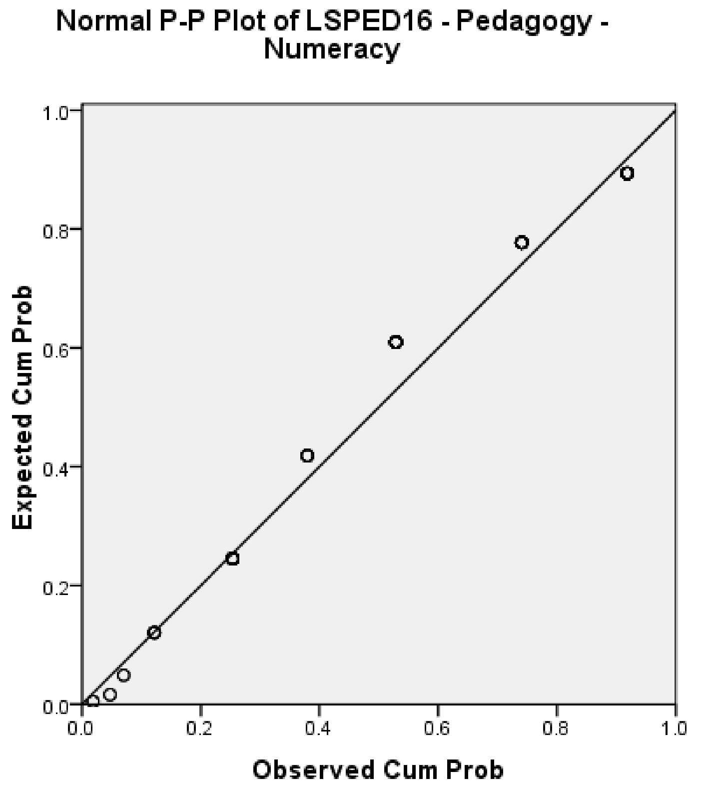

Figure 263 **P-P Plot LSPED16**

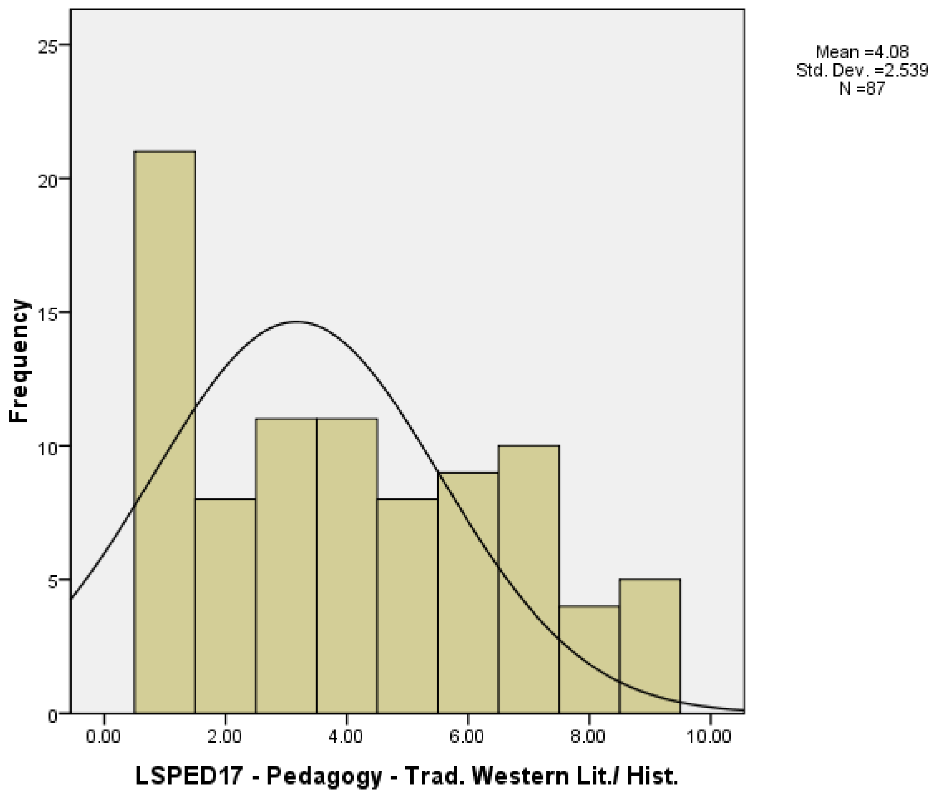

Figure 264 **Histogram LSPED17**

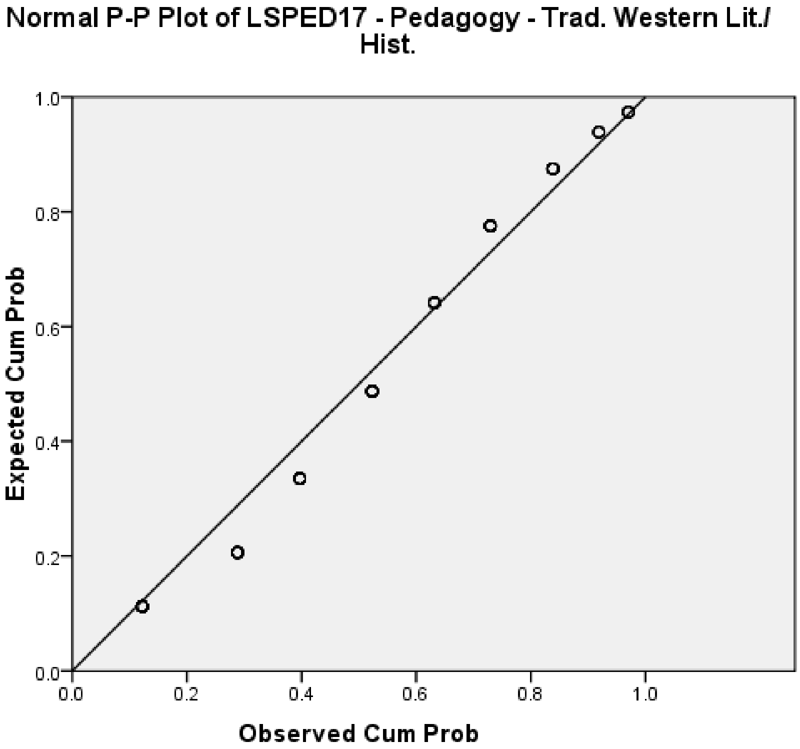

Figure 265 **P-P Plot LSPED17**

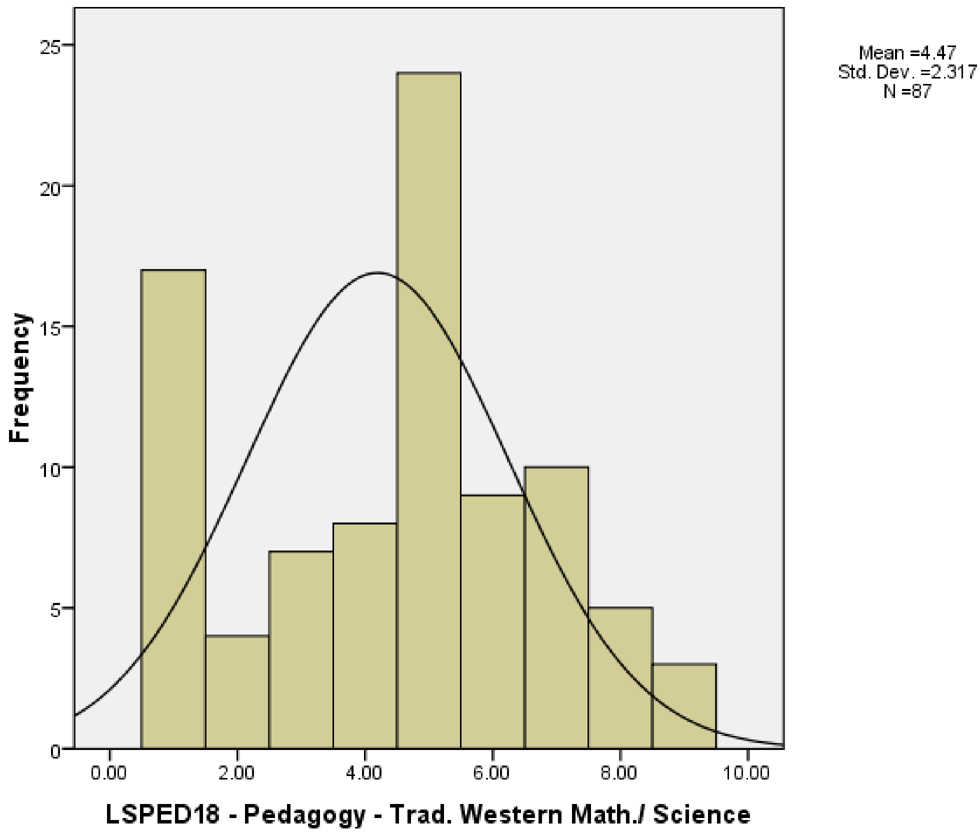

Figure 266 **Histogram LSPED18**

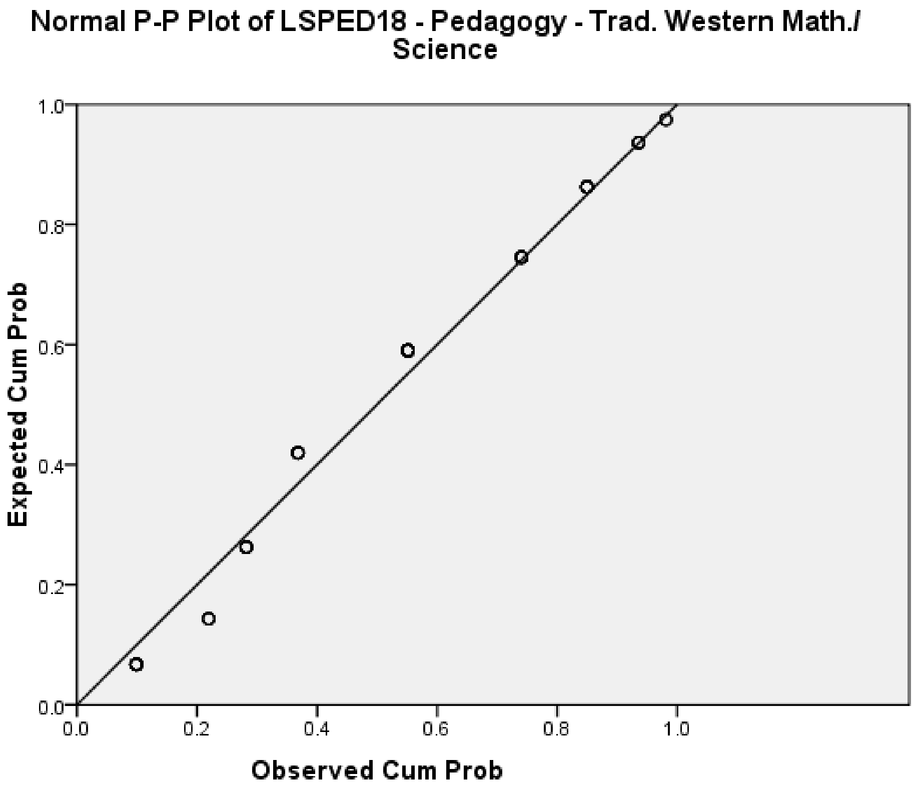

Figure 267 **P-P Plot LSPED18**

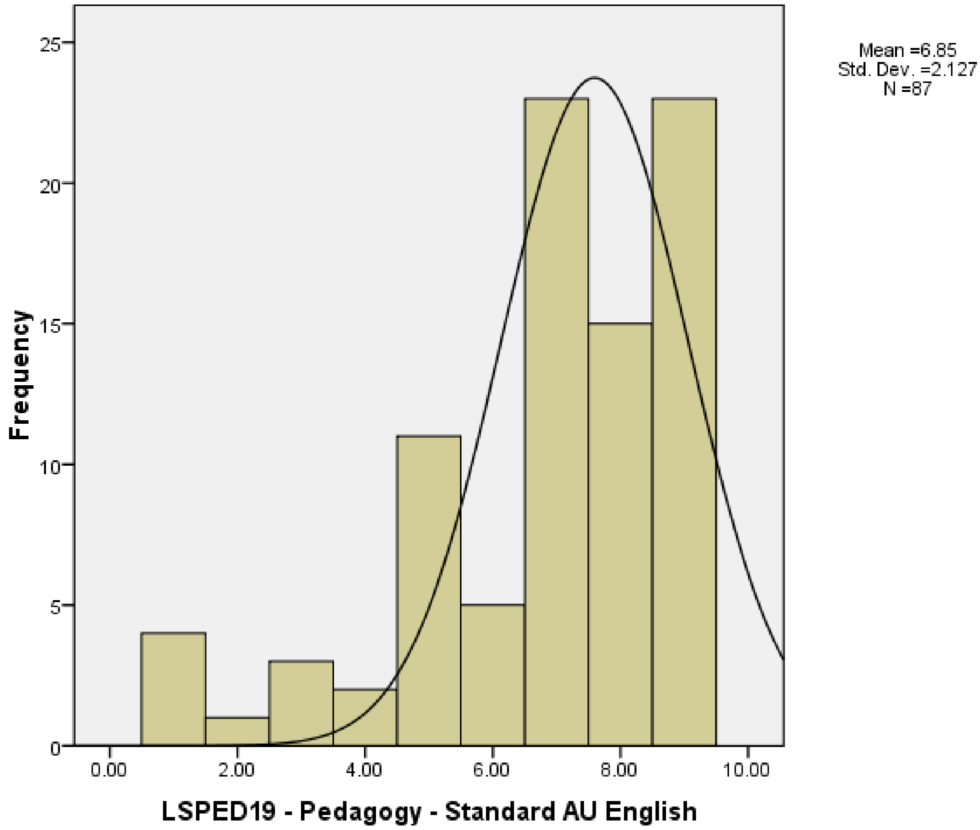

Figure 268 **Histogram LSPED19**

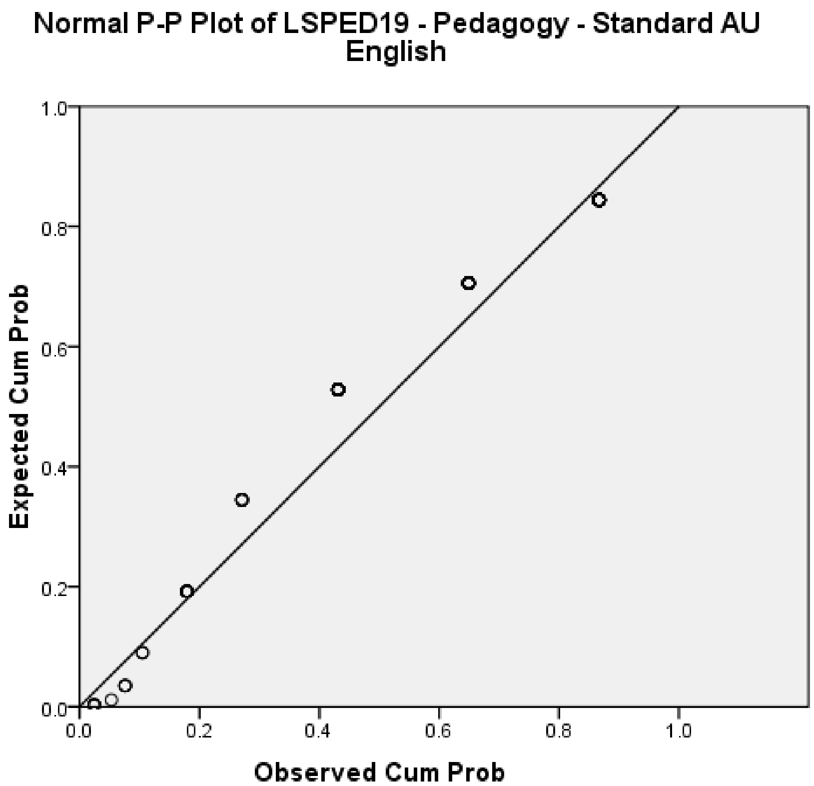

Figure 269 **P-P Plot LSPED19**

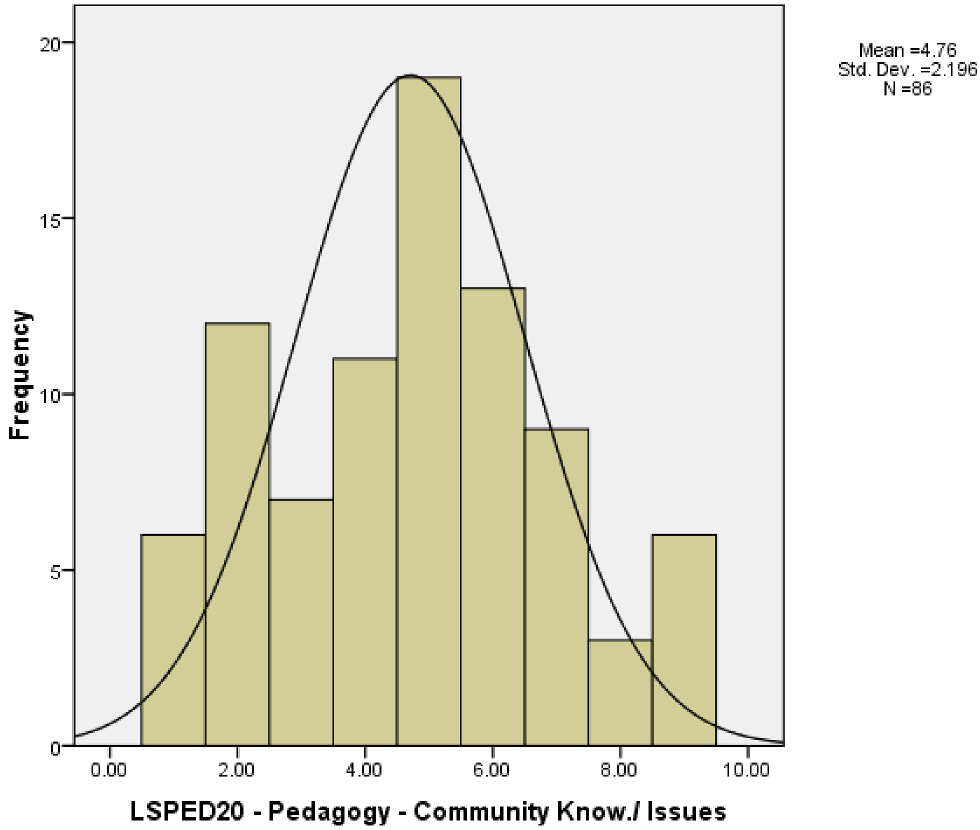

Figure 270 **Histogram LSPED20**

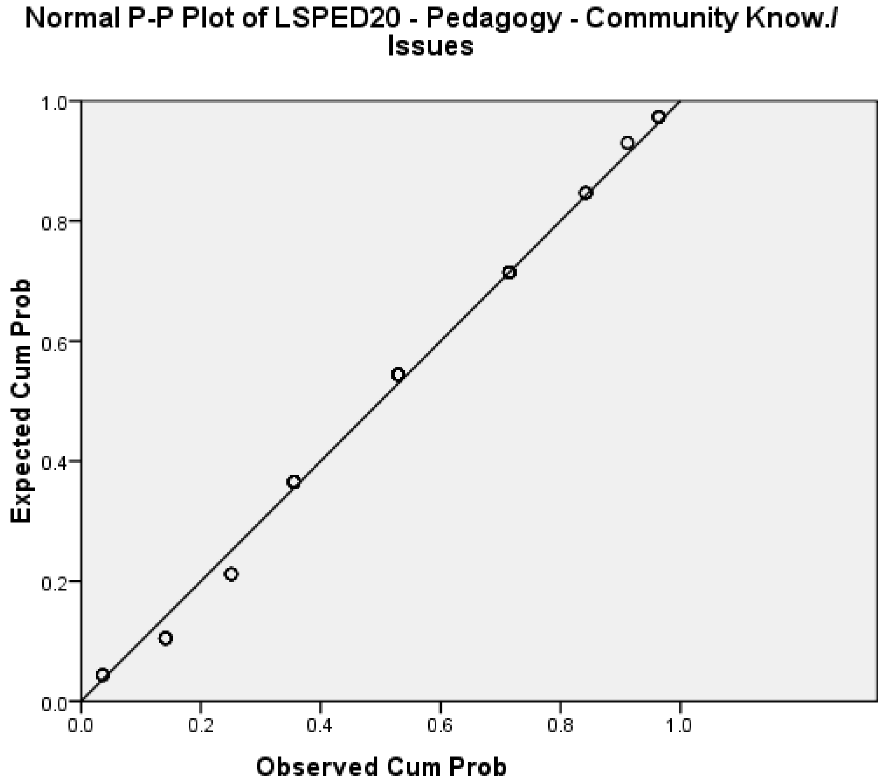

Figure 271 **P-P Plot LSPED20**

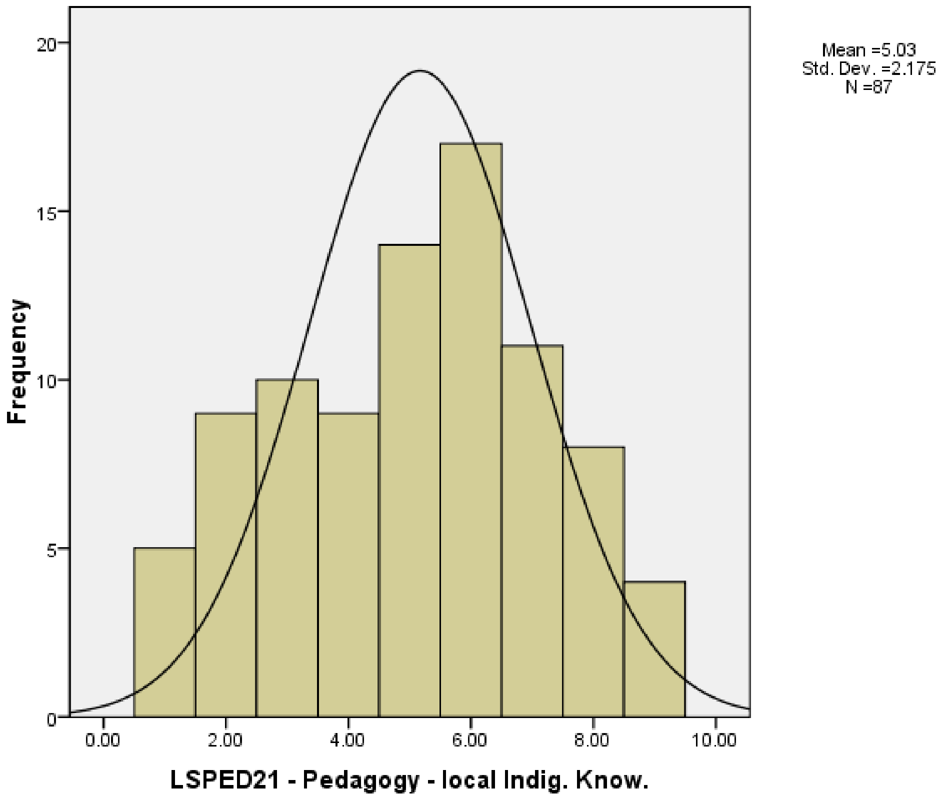

Figure 272 **Histogram LSPED21**

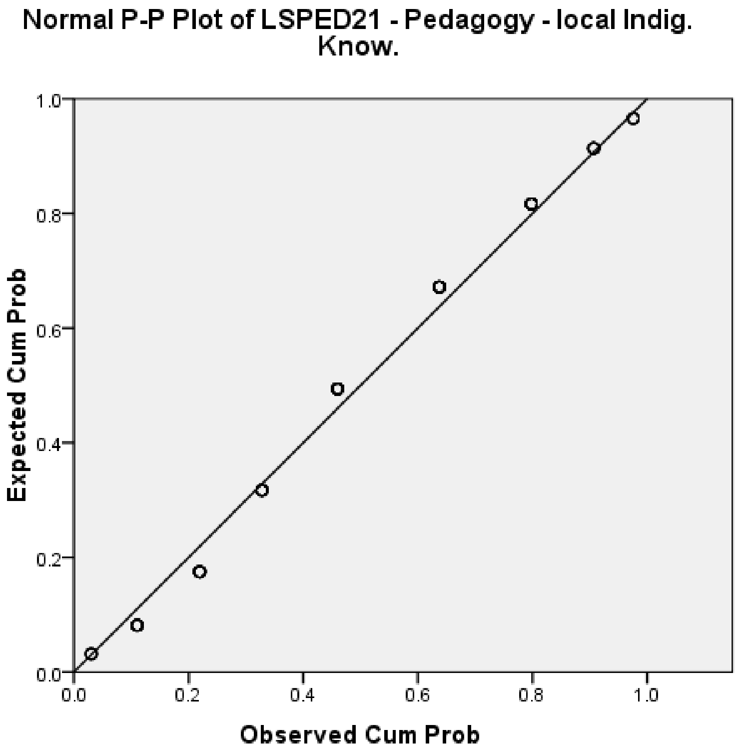

Figure 273 **P-P Plot LSPED21**

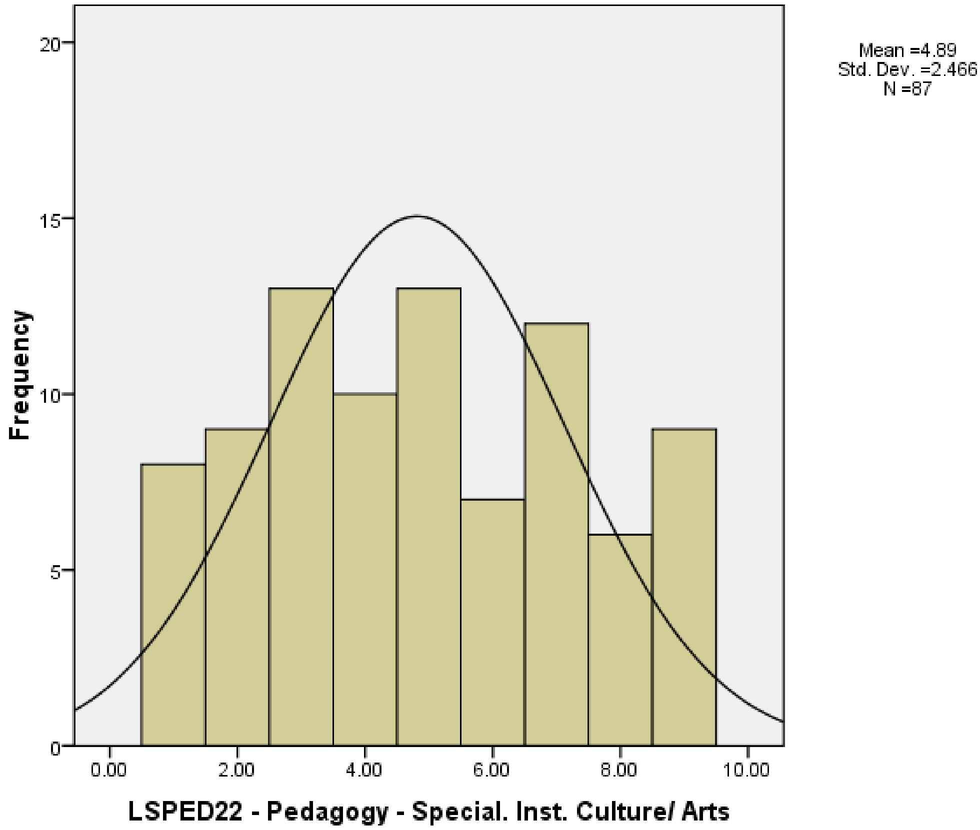

Figure 274 **Histogram LSPED22**

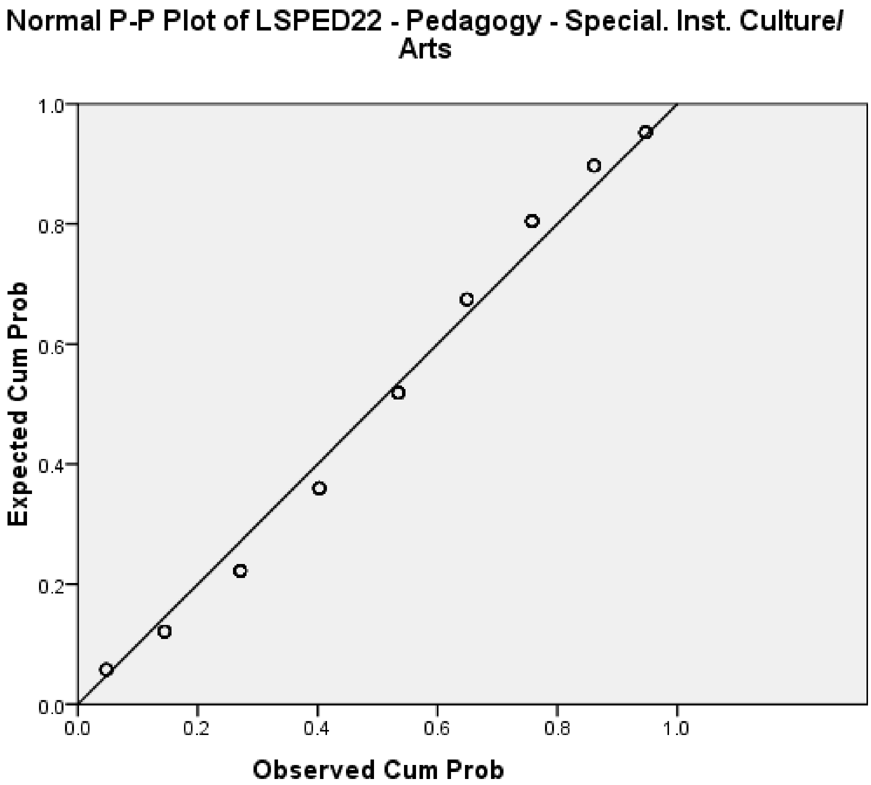

Figure 275 **P-P Plot LSPED22**

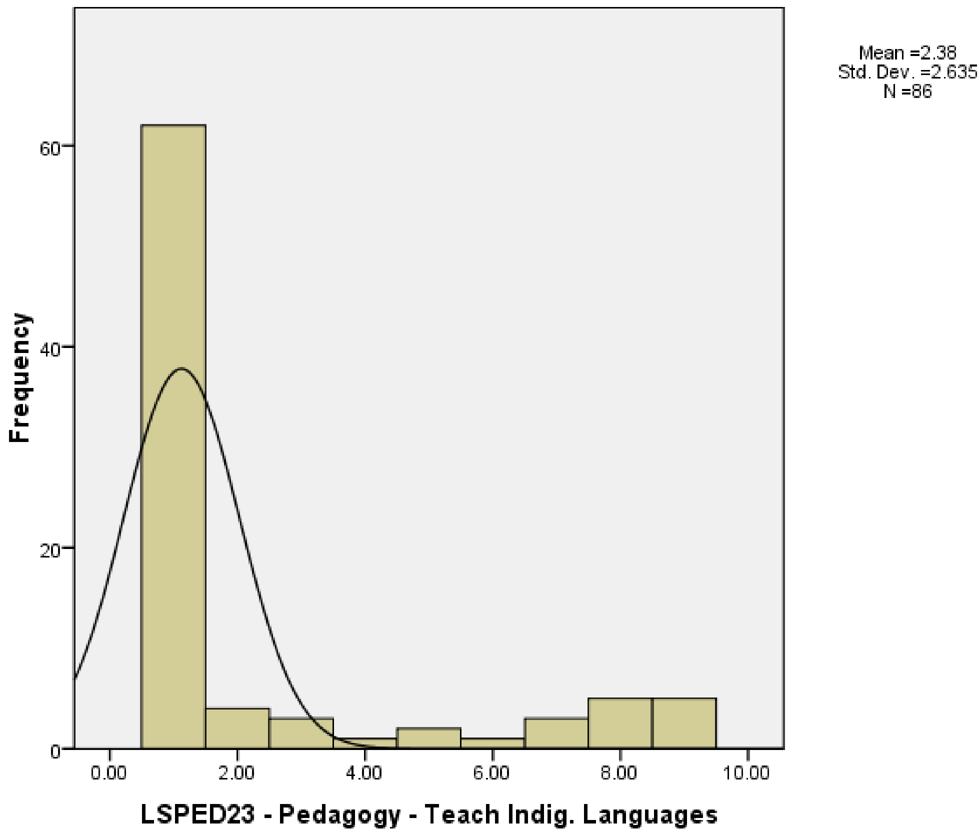

Figure 276 Histogram LSPED23

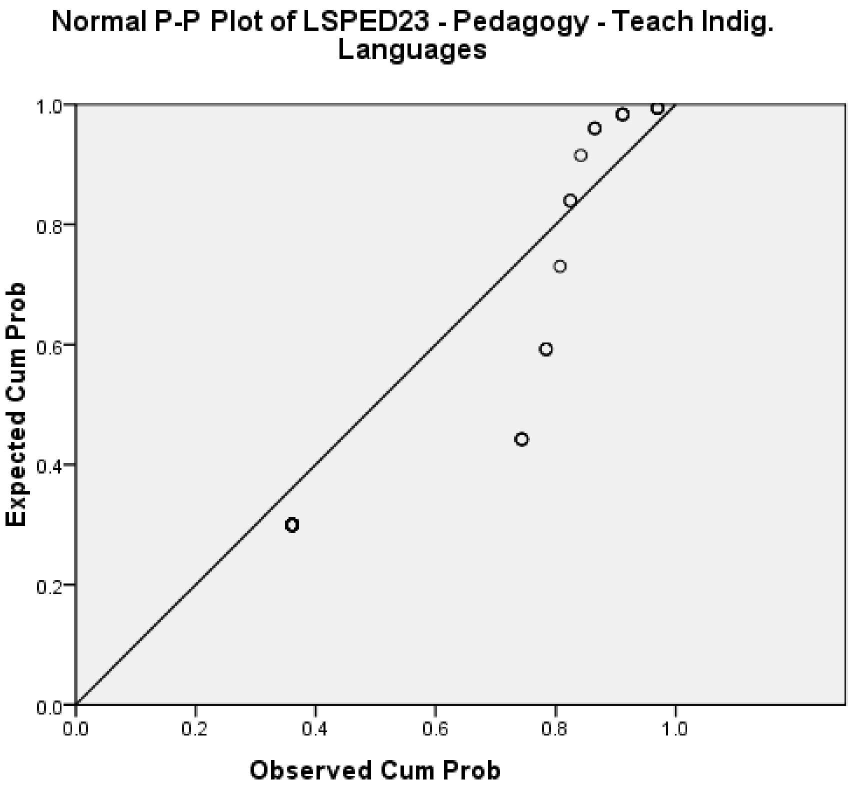

Figure 277 P-P Plot LSPED23

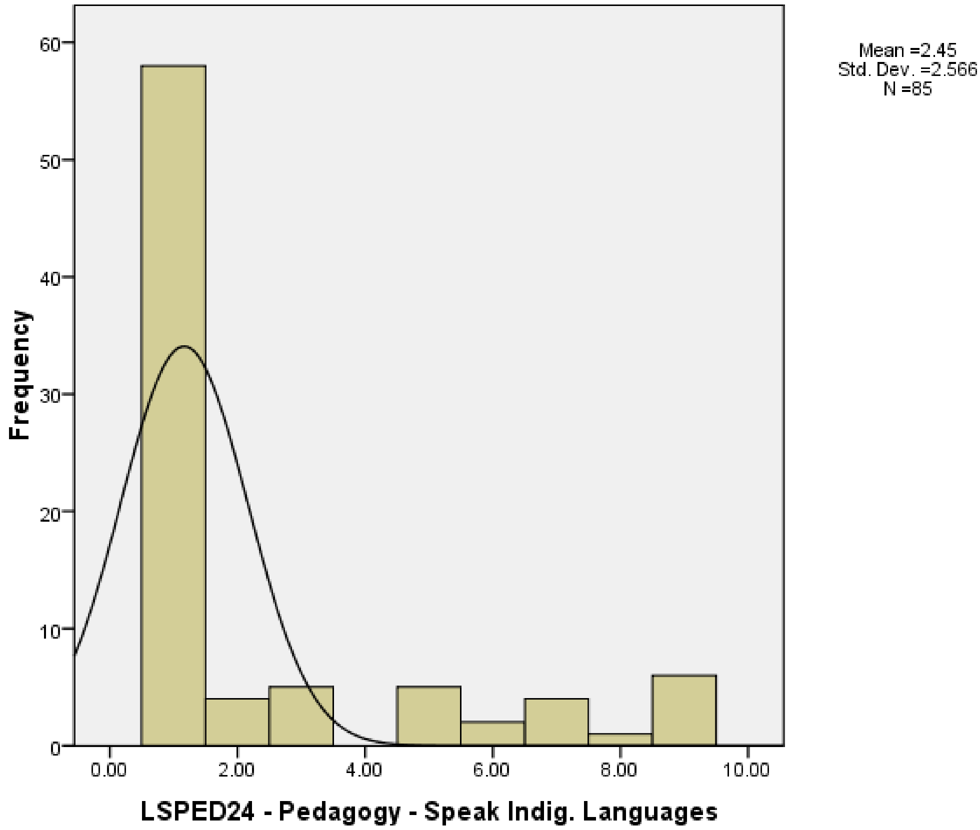

Figure 278 **Histogram LSPED24**

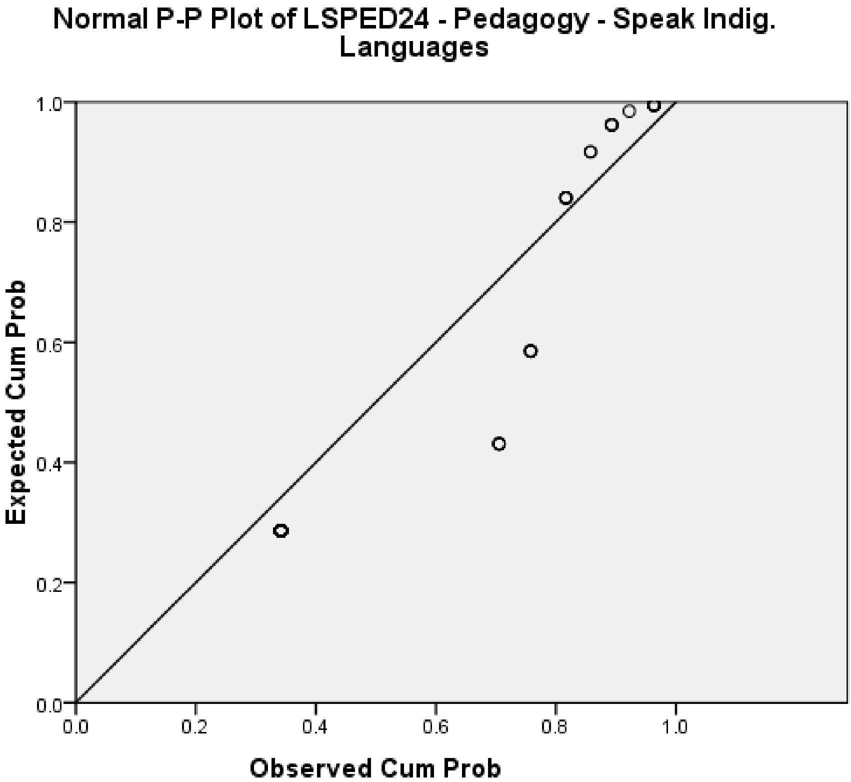

Figure 279 **P-P Plot LSPED24**

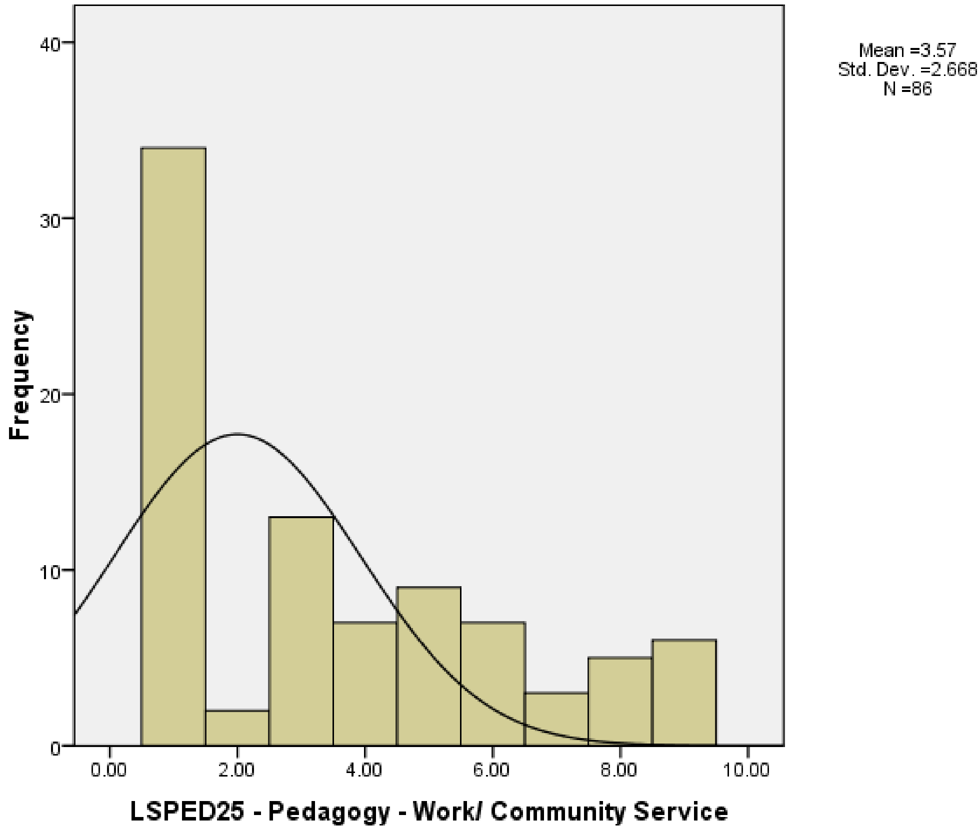

Figure 280 **Histogram LSPED25**

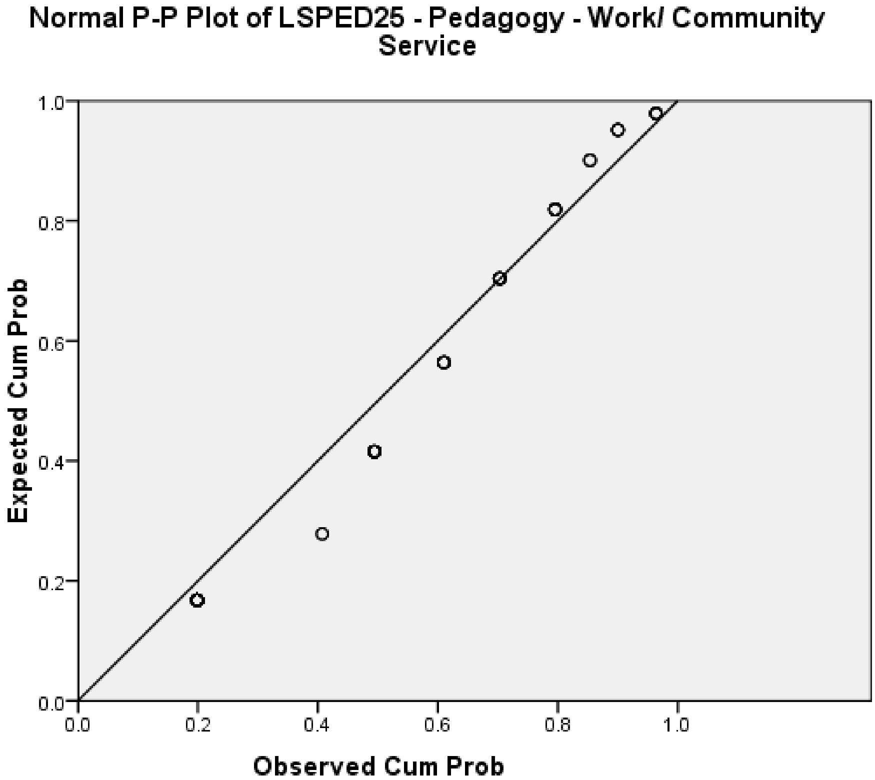

Figure 281 **P-P Plot LSPED25**

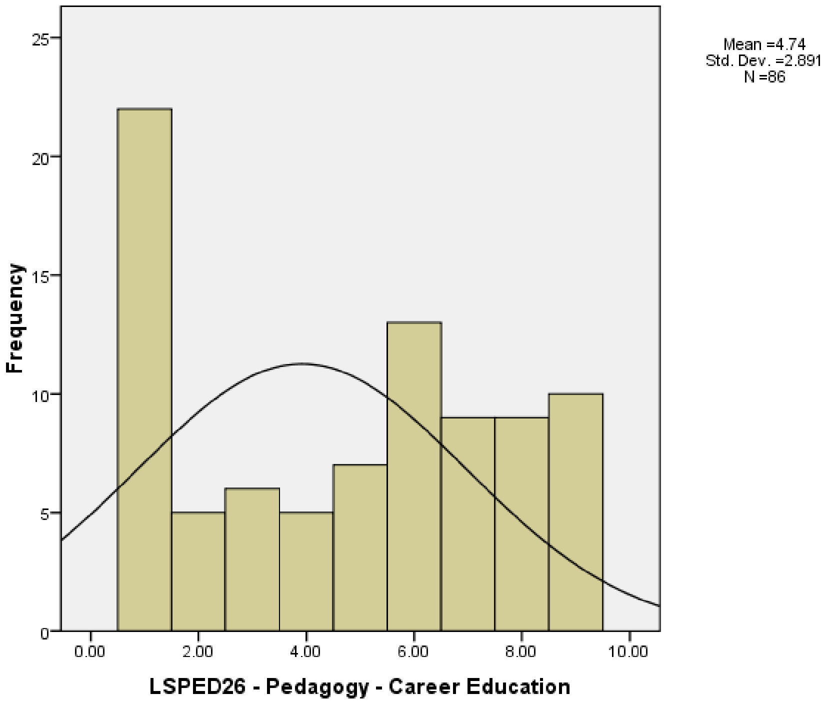

Figure 282 **Histogram LSPED26**

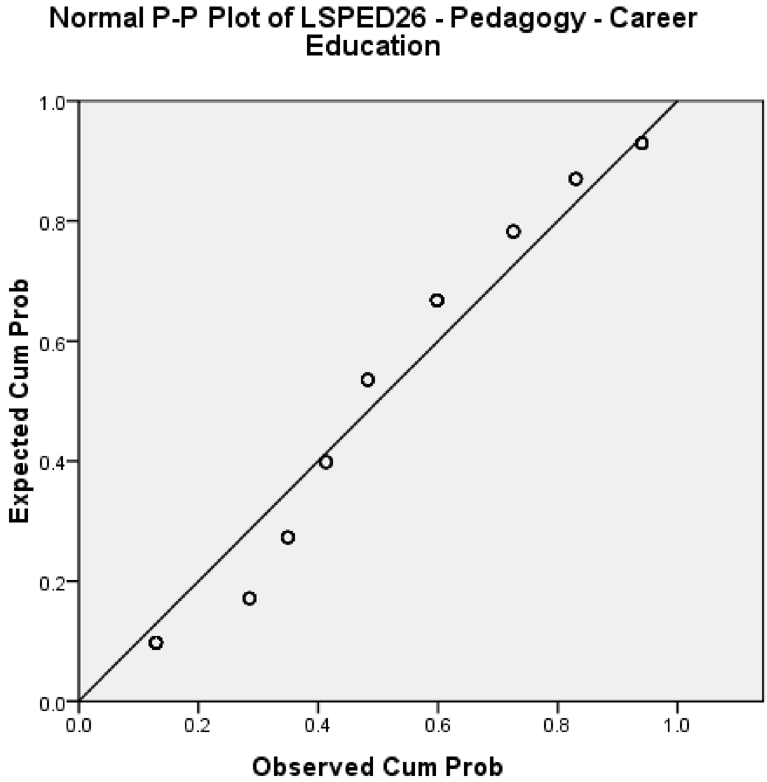

Figure 283 **P-P Plot LSPED26**

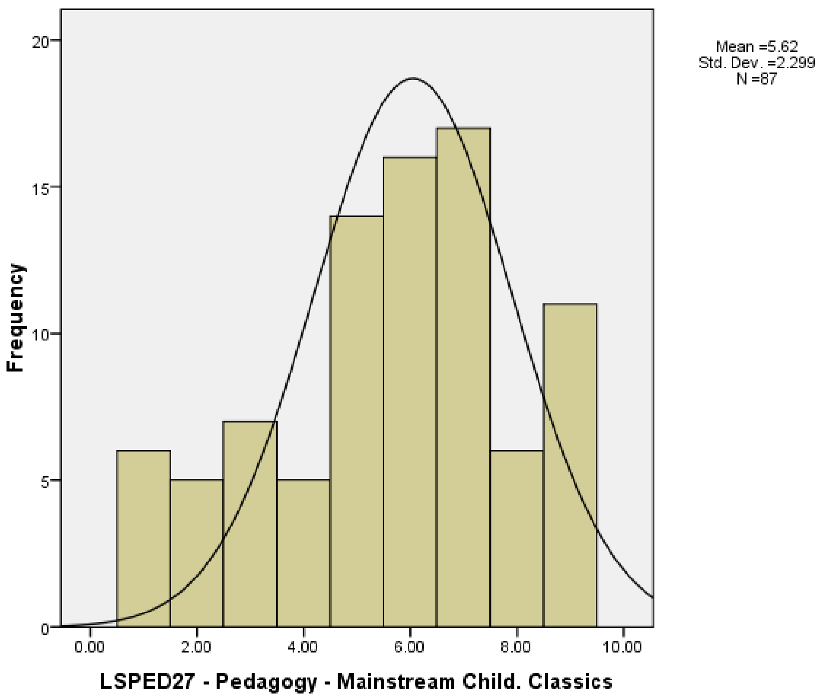

Figure 284 **Histogram LSPED27**

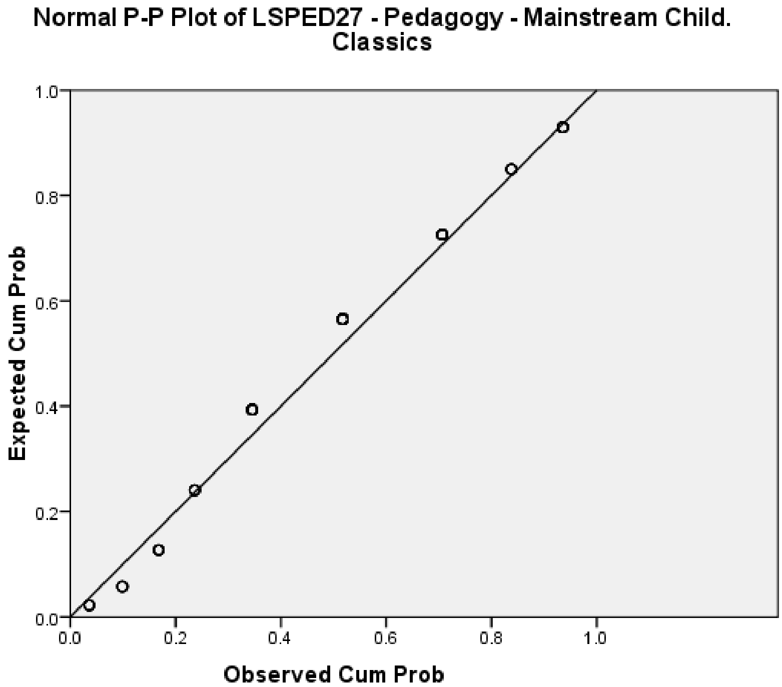

Figure 285 **LSPED27**

The principal components analysis

A principal components analysis (PCA) was conducted to reduce the number of items from 27 to composite scales (called components).

As indicated previously much of the data follows a non normal distribution but as the factor analysis is being used in a descriptive way to summarise relationships, assumptions in regards to normal data may be relaxed as long as the deviation is not too large (Tabachnick & Fidell, 2007).

The first step in the PCA was to determine whether the measures are related to each other. This was accomplished by examining the correlation matrix (next page).

The correlation matrix shows the majority of the correlations are greater than 0.4 and most variables have a medium to large correlation with at least 2 or 3 other variables and all are significant. This would suggest there may be some basis for applying an PCA.

Table 176 Correlation Matrix

	PED1	PED2	PED3	PED4	PED5	PED6	PED7	PED8	PED9	PED10	PED11	PED12	PED13	PED14	PED15	PED16	PED17	PED18	PED19	PED20	PED2.	PED22	PED23	PED24	PED25	PED26	PED27
LSPED1	1																										
LSPED2	.724**	1																									
LSPED3	.557**	.588**	1																								
LSPED4	.600**	.492**	.471**	1																							
LSPED5	.405**	.610**	.544**	.510**	1																						
LSPED6	.501**	.636**	.539**	.451**	.549**	1																					
LSPED7	.257*	.341**	.464**	.289**	.474**	.495**	1																				
LSPED8	.283**	.471**	.394**	.333**	.571**	.595**	.572**	1																			
LSPED9	.413**	.402**	.458**	.483**	.556**	.577**	.500**	.514**	1																		
LSPED10	.251*	.332**	.101	.361**	.447**	.379**	.402**	.495**	.487**	1																	
LSPED11	.292**	.310**	.464**	.366**	.505**	.538**	.588**	.594**	.503**	.453**	1																
LSPED12	.191	.307**	.367**	.294**	.456**	.478**	.703**	.588**	.449**	.488**	.590**	1															
LSPED13	.358**	.475**	.515**	.374**	.432**	.583**	.539**	.496**	.484**	.330**	.464**	.571**	1														
LSPED14	.491**	.483**	.365**	.386**	.386**	.534**	.410**	.341**	.431**	.242*	.392**	.411**	.440**	1													
LSPED15	.445**	.315**	.343**	.272*	.295**	.372**	.399**	.315**	.494**	.182	.304**	.380**	.293**	.530**	1												
LSPED16	.458**	.350**	.389**	.342**	.406**	.369**	.379**	.263*	.512**	.267*	.400**	.385**	.288**	.544**	.834**	1											
LSPED17	.288**	.072	.120	.259*	-.079	.103	-.040	-.035	-.133	.135	.094	-.060	.097	.139	.006	.004	1										
LSPED18	.166	.124	.208	.073	.014	.083	.212*	.001	-.047	.068	.218*	.151	.248*	.221*	.218*	.205	.604**	1									

Correlation Matrix (Continued)

	PED1	PED2	PED3	PED4	PED5	PED6	PED7	PED8	PED9	PED10	PED11	PED12	PED13	PED14	PED15	PED16	PED17	PED18	PED19	PED20	PED2.	PED22	PED23	PED24	PED25	PED26	PED27
LSPED19	.457**	.335**	.202	.216*	.103	.255*	.176	.233*	.198	.237*	.265*	.206	.141	.301**	.362**	.356**	.327**	.359**	1								
LSPED20	.329**	.391**	.361**	.273*	.486**	.520**	.532**	.659**	.524**	.437**	.483**	.519**	.345**	.309**	.441**	.436**	-.056	.116	.440**	1							
LSPED21	.327**	.302**	.400**	.304**	.424**	.419**	.705**	.500**	.480**	.384**	.531**	.553**	.359**	.371**	.469**	.460**	-.053	.172	.416**	.738**	1						
LSPED22	.183	.245*	.457**	.083	.300**	.345**	.646**	.341**	.317**	.186	.418**	.559**	.380**	.241*	.320**	.320**	.018	.223*	.249*	.479**	.619**	1					
LSPED23	.211	.305**	.339**	.313**	.399**	.429**	.507**	.423**	.359**	.399**	.457**	.546**	.450**	.321**	.263*	.313**	.011	.209	.248*	.433**	.457**	.448**	1				
LSPED24	.150	.269*	.284**	.183	.442**	.427**	.423**	.341**	.234*	.313**	.358**	.434**	.388**	.184	.252*	.329**	-.099	.098	.126	.416**	.389**	.277*	.638**	1			
LSPED25	-.056	.086	.213*	-.024	.293**	.210	.194	.201	.190	.216*	.194	.229*	.437**	.107	.042	.069	.098	.182	.099	.174	.071	.152	.262*	.311**	1		
LSPED26	-.066	.060	.154	-.123	.125	.078	.082	.183	.054	.111	.056	.103	.397**	-.036	-.067	-.093	.144	.162	.065	.119	.007	.131	.051	.079	.744**	1	
LSPED27	.493**	.378**	.430**	.368**	.309**	.347**	.374**	.341**	.473**	.224*	.449**	.249*	.331**	.557**	.559**	.583**	.342**	.499**	.566**	.436**	.454**	.275**	.277**	.133	.089	.056	1

Table 177 KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.855
Bartlett's Test of Sphericity	Approx. Chi-Square	1482.192
	df	351
	Sig.	.000

The adequacy of the magnitude of the correlations can be plumbed using Bartlett's test of sphericity. Barlett's test value for the correlation matrix is **1482.192** with a significance level of 0.000. This suggests there are large correlations among the variables. The high Kaiser-Meyer-Olkin measure of 0.855 would suggest there is probably a factor structure underlying the variables (refer Table 177).

Table 178 Communalities

Communalities

	Initial	Extraction
LSPED1 - Pedagogy - Lesson Scaffold	1.000	.788
LSPED2 - Pedagogy - Pre-Planned	1.000	.766
LSPED3 - Pedagogy - Practical	1.000	.768
LSPED4 - Pedagogy - Classroom Management	1.000	.669
LSPED5 - Pedagogy - Movement/ Use of Space	1.000	.697
LSPED6 - Pedagogy - Packaged T&L	1.000	.694
LSPED7 - Pedagogy - Learn from Community Elders	1.000	.771
LSPED8 - Pedagogy - Choose Topics/ Curriculum	1.000	.774
LSPED9 - Pedagogy - Individually Tailored Instruction	1.000	.737
LSPED10 - Pedagogy - Negotiate Learning Tasks	1.000	.762

LSPED11 - Pedagogy - Exploration of Identity/ Voice	1.000	.635
LSPED12 - Pedagogy - Indig. Communication Styles	1.000	.687
LSPED13 - Pedagogy - Real World Knowledge	1.000	.688
LSPED14 - Pedagogy - KLA	1.000	.580
LSPED15 - Pedagogy - Literacy	1.000	.833
LSPED16 - Pedagogy - Numeracy	1.000	.845
LSPED17 - Pedagogy - Trad. Western Lit./ Hist.	1.000	.832
LSPED18 - Pedagogy - Trad. Western Math./ Science	1.000	.792
LSPED19 - Pedagogy - Standard AU English	1.000	.629
LSPED20 - Pedagogy - Community Know./ Issues	1.000	.710
LSPED21 - Pedagogy - local Indig. Know.	1.000	.794
LSPED22 - Pedagogy - Special. Inst. Culture/ Arts	1.000	.806
LSPED23 - Pedagogy - Teach Indig. Languages	1.000	.730
LSPED24 - Pedagogy - Speak Indig. Languages	1.000	.745
LSPED25 - Pedagogy - Work/ Community Service	1.000	.869
LSPED26 - Pedagogy - Career Education	1.000	.898
LSPED27 - Pedagogy - Mainstream Child. Classics	1.000	.800

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An examination of the squared multiple correlation coefficient (R^2) or communalities (refer Table 178) would indicate a reasonable level of variation (small < 0.3) in the items is being explained by the component. Specifically between 58% and 90% of the variance in items is being explained by the component structure upon extraction.

Table 179 Total Variance Explained

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.438	38.660	38.660	10.438	38.660	38.660	4.506	16.690	16.690
2	2.482	9.193	47.853	2.482	9.193	47.853	3.380	12.519	29.209
3	2.133	7.900	55.753	2.133	7.900	55.753	3.321	12.302	41.510
4	1.855	6.870	62.623	1.855	6.870	62.623	2.727	10.099	51.609
5	1.268	4.697	67.320	1.268	4.697	67.320	2.198	8.142	59.751
6	1.105	4.094	71.413	1.105	4.094	71.413	2.141	7.931	67.682
7	1.018	3.772	75.185	1.018	3.772	75.185	2.026	7.503	75.185
8	.869	3.220	78.404						
9	.710	2.631	81.035						
10	.580	2.149	83.184						
11	.509	1.887	85.071						
12	.468	1.732	86.803						
13	.430	1.592	88.395						
14	.408	1.512	89.907						
15	.398	1.473	91.380						
16	.357	1.323	92.703						
17	.296	1.098	93.801						
18	.260	.961	94.762						
19	.237	.877	95.639						
20	.216	.801	96.440						
21	.186	.688	97.129						
22	.173	.641	97.769						
23	.150	.554	98.324						
24	.140	.519	98.843						
25	.125	.463	99.306						
26	.102	.378	99.684						
27	.085	.316	100.000						

The above table (refer Table 179) shows that seven of the eigenvalues exceed one – as a result 7 components will be extracted. Component 1 is accounting for ~ 39% of the total variance of 27 (27 because we have 27 variables and the variance for each variable has been standardised to 1). Components 2 and explain a further 9% and 8% of the total variance (refer Table 163) respectively. The fourth component explains a further 7% of the total variance; component 5, a further 5%; and components 6 and 7 an additional 4% each.

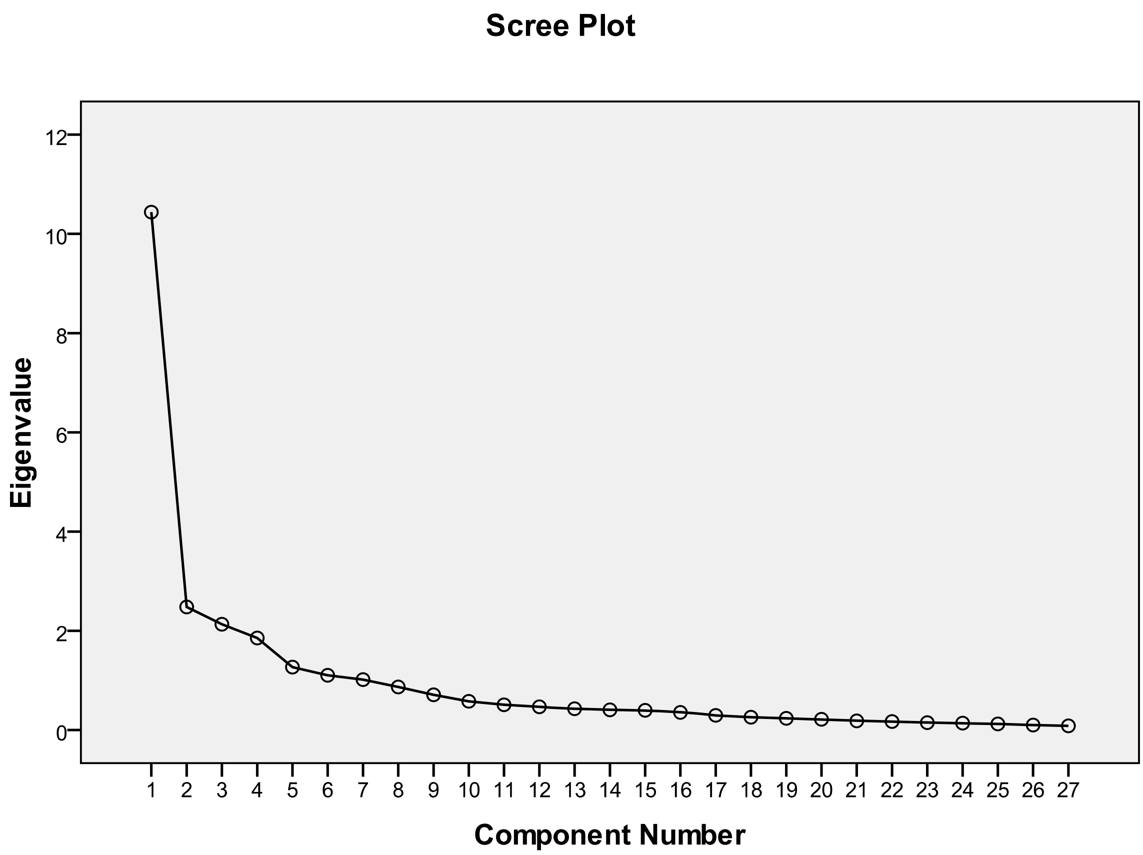

Figure 286 **Scree Plot**

Examination of the scree plot (refer Figure 286) would indicate a 7 component solution is appropriate.

Table 180 Component Matrix

Component Matrix

	Component						
	1	2	3	4	5	6	7
LSPED6	.758			-.325			
LSPED7	.752	-.270		.249		-.170	-.182
LSPED9	.751		-.192	-.149	-.105	.311	
LSPED21	.739		-.151	.411			-.217
LSPED11	.733				.283		
LSPED20	.724	-.140		.247		.260	-.177
LSPED8	.721	-.322		-.105	.156	.246	-.227
LSPED5	.715	-.272		-.322			
LSPED12	.712	-.335		.201	.126	-.104	
LSPED13	.702	-.126	.285	-.256		-.154	
LSPED2	.683	.129		-.494		-.153	-.109
LSPED16	.673	.267	-.238	.215	-.370		.278
LSPED3	.670	.121		-.282	-.166	-.365	-.252
LSPED14	.649	.305	-.114		-.143		.164
LSPED27	.644	.544		.184		.214	
LSPED15	.632	.291	-.251	.253	-.427		.183
LSPED1	.630	.483	-.112	-.364			
LSPED23	.621	-.256		.185	.181	-.248	.375
LSPED22	.586	-.148		.418		-.352	-.370
LSPED4	.571	.205	-.161	-.423	.284		.121
LSPED10	.559	-.238	.121		.413	.421	.173
LSPED24	.523	-.384		.118		-.240	.494
LSPED19	.489	.463	.175	.276		.252	
LSPED17		.589	.546		.418		
LSPED26	.137	-.210	.800	-.122	-.343	.160	-.194
LSPED25	.287	-.295	.721	-.105	-.351	.156	.148
LSPED18	.317	.479	.526	.318	.182	-.220	

.

The component matrix (refer Table 180) gives the component loadings for each item on the underlying constructs. It is clear all items load well on at least one component.

Table 181 **Rotated Component Matrix**

Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
LSPED2	.833	.144	.154	.127			
LSPED1	.759		.364		.243		
LSPED3	.740	.395	.163	-.104			.136
LSPED6	.681	.205	.172	.317		.235	
LSPED4	.666		.127	.351	.144	.141	-.200
LSPED5	.577	.217	.145	.376	-.211	.258	.208
LSPED13	.570	.238	.107	.165		.333	.386
LSPED22	.135	.852	.142		.101	.157	
LSPED7	.263	.714	.161	.272		.303	
LSPED21	.132	.708	.377	.329		.138	
LSPED12	.213	.541	.139	.351		.450	
LSPED20	.154	.527	.382	.497			.103
LSPED15	.204	.220	.849			.143	
LSPED16	.241	.173	.832			.243	
LSPED27	.266	.181	.671	.219	.437		
LSPED14	.471	.106	.535		.138	.182	
LSPED10	.129			.796	.124	.282	
LSPED8	.384	.429		.629	-.124		.144
LSPED9	.454	.219	.436	.502	-.170		
LSPED11	.334	.402	.165	.497	.162	.244	
LSPED17	.125	-.131			.887		
LSPED18		.190	.178		.817	.167	.134
LSPED19		.187	.502	.258	.504	-.106	
LSPED24	.128	.186	.137	.138		.794	.144
LSPED23	.175	.305	.123	.222	.124	.725	
LSPED26					.131		.927
LSPED25				.117		.255	.884

Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
LSPED2	.833	.144	.154	.127			
LSPED1	.759		.364		.243		
LSPED3	.740	.395	.163	-.104			.136
LSPED6	.681	.205	.172	.317		.235	
LSPED4	.666		.127	.351	.144	.141	-.200
LSPED5	.577	.217	.145	.376	-.211	.258	.208
LSPED13	.570	.238	.107	.165		.333	.386
LSPED22	.135	.852	.142		.101	.157	
LSPED7	.263	.714	.161	.272		.303	
LSPED21	.132	.708	.377	.329		.138	
LSPED12	.213	.541	.139	.351		.450	
LSPED20	.154	.527	.382	.497			.103
LSPED15	.204	.220	.849			.143	
LSPED16	.241	.173	.832			.243	
LSPED27	.266	.181	.671	.219	.437		
LSPED14	.471	.106	.535		.138	.182	
LSPED10	.129			.796	.124	.282	
LSPED8	.384	.429		.629	-.124		.144
LSPED9	.454	.219	.436	.502	-.170		
LSPED11	.334	.402	.165	.497	.162	.244	
LSPED17	.125	-.131			.887		
LSPED18		.190	.178		.817	.167	.134
LSPED19		.187	.502	.258	.504	-.106	
LSPED24	.128	.186	.137	.138		.794	.144
LSPED23	.175	.305	.123	.222	.124	.725	
LSPED26					.131		.927
LSPED25				.117		.255	.884

The rotated component matrix (refer Table 181) indicates a clear 7 component solution with LSPED1 – LSPED6 loading on component 1(Conventional) and LSPED7, LSPED12 and LSPED20 – LSPED22 loading on component 2 (Progressive). Component 3 (School Subjects) consisted of LSPED14-16 and LSPED27; component 4 (Community/ Indigenous) which consisted of LSPED8-11; and component 5 (Canonical/ Discipline) which consisted of LSPED17-19. The sixth component (Language), consisted of LSPED23-LSPED24, while the seventh component (Vocational) consisted of LSPED13 and LSPED25-26. LSSC5 is cross loading on both factors.

Reliability analysis showed that all components displayed internal consistency at 0.7 or better. Two items (LSPED19 and LSPED13) were found to decrease the reliability of the component (refer Table 182) however they were not deleted as they did not decrease the internal consistency below 0.7. The scale reliability findings are summarised below.

Table 182 **Items/Components**

Items/ Components	Component Loading
1. Conventional (α=.879)	
LSPED2 - Pedagogy - Pre-Planned	.833
LSPED1 - Pedagogy - Lesson Scaffold	.759
LSPED3 - Pedagogy - Practical	.740
LSPED6 - Pedagogy - Packaged T&L	.681
LSPED4 - Pedagogy - Classroom Management	.666
LSPED5 - Pedagogy - Movement/ Use of Space	.577
2. Progressive (α=.805)	
LSPED10 - Pedagogy - Negotiate Learning Tasks	.796
LSPED8 - Pedagogy - Choose Topics/ Curriculum	.629
LSPED9 - Pedagogy - Individually Tailored Instruction	.502
LSPED11 - Pedagogy - Exploration of Identity/ Voice	.497
3. School Subjects (α=.864)	
LSPED15 - Pedagogy - Literacy	.849
LSPED16 - Pedagogy - Numeracy	.832
LSPED27 - Pedagogy - Mainstream Child. Classics	.671
LSPED14 - Pedagogy - KLA	.535
4. Community (α=.885)	
LSPED22 - Pedagogy - Special. Inst. Culture/ Arts	.852
LSPED7 - Pedagogy - Learn from Community Elders	.714
LSPED21 - Pedagogy - local Indig. Know.	.708
LSPED12 - Pedagogy - Indig. Communication Styles	.541
LSPED20 - Pedagogy - Community Know./ Issues	.527

5. Canonical/ Discipline (α=.721)	
LSPED17 - Pedagogy - Trad. Western Lit./ Hist.	.887
LSPED18 - Pedagogy - Trad. Western Math./ Science	.817
LSPED19 - Pedagogy - Standard AU English	.504
6. Language (α=.709)	
LSPED24 - Pedagogy - Speak Indig. Languages	.794
LSPED23 - Pedagogy - Teach Indig. Languages	.725
7. Vocational (α=.743)	
LSPED13 - Pedagogy - Real World Knowledge	.386
LSPED26 - Pedagogy - Career Education	.927
LSPED25 - Pedagogy - Work/ Community Service	.884

Pedagogy: Conventional

Table 183 Reliability Statistics

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.877	.879	6

Table 184 Item Statistics

Item Statistics

	Mean	Std. Deviation	N
LSPED1 - Pedagogy - Lesson Scaffold	6.1395	2.03014	86
LSPED2 - Pedagogy - Pre-Planned	5.3023	2.34179	86
LSPED3 - Pedagogy - Practical	5.6860	2.11583	86
LSPED4 - Pedagogy - Classroom Management	5.4884	2.44826	86
LSPED5 - Pedagogy - Movement/ Use of Space	4.1628	2.50111	86
LSPED6 - Pedagogy - Packaged T&L	4.5814	2.33875	86

Table 185 Item-Total Statistics

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LSPED1	25.2209	87.351	.702	.638	.854
LSPED2	26.0581	79.891	.782	.689	.838
LSPED3	25.6744	86.763	.682	.474	.856
LSPED4	25.8721	84.160	.622	.458	.867
LSPED5	27.1977	82.090	.657	.512	.861
LSPED6	26.7791	84.009	.668	.471	.858

Pedagogy: Progressive

Table 186 **Reliability Statistics**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.803	.805	4

Table 187 **Item Statistics**

Item Statistics

	Mean	Std. Deviation	N
LSPED8 - Pedagogy - Choose Topics/ Curriculum	3.5057	2.14516	87
LSPED9 - Pedagogy - Individually Tailored Instruction	4.7126	2.38165	87
LSPED10 - Pedagogy - Negotiate Learning Tasks	2.7471	1.86285	87
LSPED11 - Pedagogy - Exploration of Identity/ Voice	3.9655	2.19645	87

Table 188 **Item-Total Statistics**

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LSPED8	11.4253	27.247	.661	.447	.731
LSPED9	10.2184	26.149	.609	.371	.760
LSPED10	12.1839	31.198	.576	.334	.774
LSPED11	10.9655	27.266	.635	.419	.744

Pedagogy: School Subjects

Table 189 **Reliability Statistics**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.850	.858	4

Table 190 **Item Statistics**

Item Statistics

	Mean	Std. Deviation	N
LSPED14 - Pedagogy - KLA	5.9655	2.27958	87
LSPED15 - Pedagogy - Literacy	6.9310	1.77051	87
LSPED16 - Pedagogy - Numeracy	6.4253	2.06652	87
LSPED27 - Pedagogy - Mainstream Child. Classics	5.6207	2.29884	87

Table 191 **Item-Total Statistics**

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LSPED14	18.9770	28.883	.622	.391	.841
LSPED15	18.0115	31.244	.754	.708	.792
LSPED16	18.5172	28.276	.763	.721	.778
LSPED27	19.3218	28.105	.653	.429	.827

Pedagogy: Community

Table 192 **Reliability Statistics**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.886	.887	5

Table 193 **Item Statistics**

Item Statistics

	Mean	Std. Deviation	N
LSPED7 - Pedagogy - Learn from Community Elders	4.4235	2.37736	85
LSPED12 - Pedagogy - Indig. Communication Styles	3.6941	2.20941	85
LSPED20 - Pedagogy - Community Know./ Issues	4.7529	2.20878	85
LSPED21 - Pedagogy - local Indig. Know.	5.0471	2.19797	85
LSPED22 - Pedagogy - Special. Inst. Culture/ Arts	4.9294	2.45817	85

Table 194 **Item-Total Statistics**

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LSPED7	18.4235	56.628	.784	.664	.847
LSPED12	19.1529	61.369	.695	.531	.868
LSPED20	18.0941	62.277	.665	.563	.875
LSPED21	17.8000	58.471	.804	.709	.844
LSPED22	17.9176	58.505	.685	.489	.872

Pedagogy: Canonical/ Discipline

Table 195 **Reliability Statistics**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.697	.694	3

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items

Table 196 **Item Statistics**

Item Statistics

	Mean	Std. Deviation	N
LSPED17 - Pedagogy - Trad. Western Lit./ Hist.	4.0805	2.53908	87
LSPED18 - Pedagogy - Trad. Western Math./ Science	4.4713	2.31697	87
LSPED19 - Pedagogy - Standard AU English	6.8506	2.12695	87

Table 197 **Item-Total Statistics**

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LSPED17	11.3218	13.430	.572	.379	.527
LSPED18	10.9310	14.507	.603	.394	.487
LSPED19	8.5517	18.925	.382	.148	.751

Pedagogy: Language

Table 198 **Reliability Statistics**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.779	.779	2

Table 199 **Item Statistics**

Item Statistics

	Mean	Std. Deviation	N
LSPED23 - Pedagogy - Teach Indig. Languages	2.4167	2.65806	84
LSPED24 - Pedagogy - Speak Indig. Languages	2.4643	2.57629	84

Table 200 **Item-Total Statistics**

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LSPED23	2.4643	6.637	.638	.407	.[a]
LSPED24	2.4167	7.065	.638	.407	.[a]

Pedagogy: Vocational

Table 201 **Reliability Statistics**

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.772	.767	3

Table 202 **Item Statistics**

Item Statistics

	Mean	Std. Deviation	N
LSPED13 - Pedagogy - Real World Knowledge	4.4706	2.27087	85
LSPED25 - Pedagogy - Work/ Community Service	3.6000	2.66905	85
LSPED26 - Pedagogy - Career Education	4.7529	2.90691	85

Table 203 **Item-Total Statistics**

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LSPED13	8.3529	27.112	.441	.197	.851
LSPED25	9.2235	18.842	.722	.574	.556
LSPED26	8.0706	17.471	.690	.560	.594

Appendix 3.4 ANCOVA Analysis Constructs – Teachers Survey

Table 204 Between-Subjects Factors

Between-Subjects Factors

		Value Label	N
hubaff_like	.00	like	41
	1.00	hubaff	139
Location	1.00	Metropolitan	107
	2.00	Provincial	60
	3.00	Remote or Very Remote	13
School_Type	1	Primary	68
	2	Secondary	100
	3	K-12	12

Indigenous School Ethos

Table 205 Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	121.401[a]	7	17.343	3.719	.001	.131
Intercept	.600	1	.600	.129	.720	.001
hubaff_like	30.112	1	30.112	6.458	.012	.036
Location	10.063	2	5.031	1.079	.342	.012
School_Type	2.211	2	1.106	.237	.789	.003
ICSEA_VALUE	.384	1	.384	.082	.774	.000
Indigenous_Students	15.116	1	15.116	3.242	.074	.018
Error	801.994	172	4.663			
Total	6967.000	180				
Corrected Total	923.394	179				

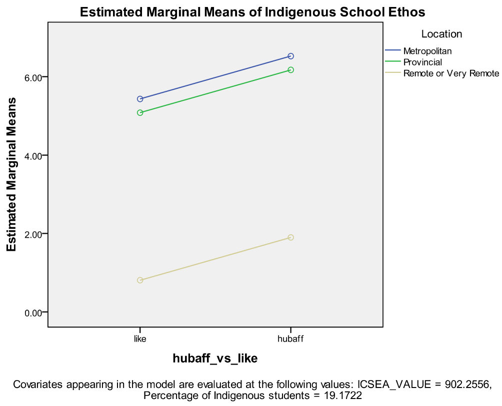

Figure 287 P-P Plot - Estimated Marginal Means of Indigenous School Ethos

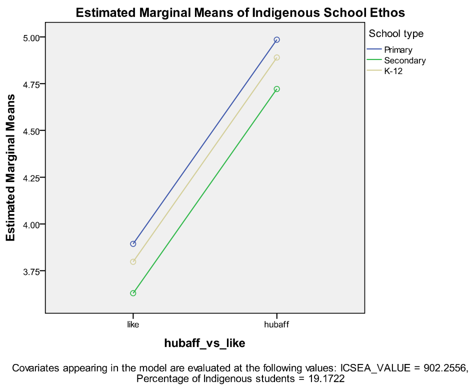

Figure 288 P-P Plot - Estimated Marginal Means of Indigenous School Ethos

School Governance and Community

Table 206 **Tests of Between-Subjects Effects**

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	191.065[a]	7	27.295	5.145	.000	.173
Intercept	.142	1	.142	.027	.870	.000
hubaff_like	4.600	1	4.600	.867	.353	.005
Location	27.392	2	13.696	2.582	.079	.029
School_Type	4.168	2	2.084	.393	.676	.005
ICSEA_VALUE	.116	1	.116	.022	.883	.000
Indigenous_Students	39.106	1	39.106	7.371	.007	.041
Error	912.513	172	5.305			
Total	4262.000	180				
Corrected Total	1103.578	179				

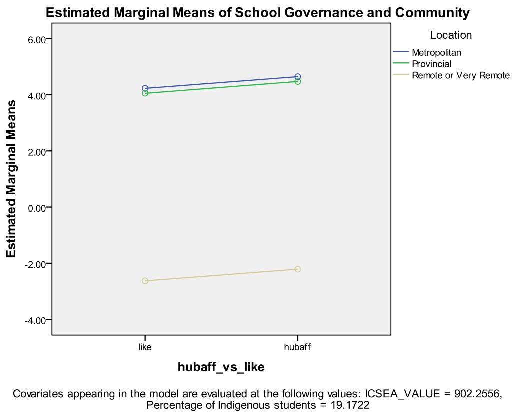

Figure 289 P-P Plot - Estimated Marginal Means of School Governance and Community

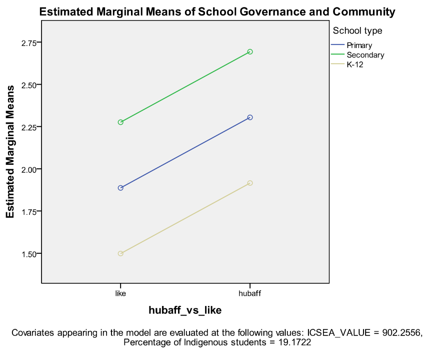

Figure 290 P-P Plot - Estimated Marginal Means of School Governance and Community

School Community Engagement

Table 207 Test of Between-Subjects Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	131.183[a]	7	18.740	5.130	.000	.173
Intercept	.379	1	.379	.104	.748	.001
hubaff_like	23.340	1	23.340	6.389	.012	.036
Location	13.960	2	6.980	1.911	.151	.022
School_Type	14.822	2	7.411	2.029	.135	.023
ICSEA_VALUE	.447	1	.447	.122	.727	.001
Indigenous_Students	30.463	1	30.463	8.339	.004	.046
Error	628.344	172	3.653			
Total	3443.000	180				
Corrected Total	759.528	179				

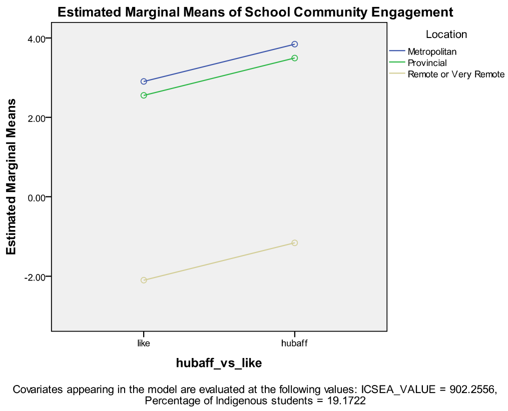

Figure 291 P-P Plot - Estimated Marginal Means of Community Engagement

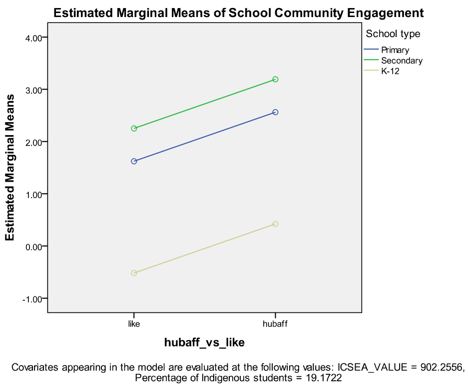

Figure 292 P-P Plot - Estimated Marginal Means of School Community Engagement

Promoting High Expectations Leadership

Table 208 Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	135.831[a]	7	19.404	4.419	.000	.152
Intercept	1.580	1	1.580	.360	.549	.002
hubaff_like	18.307	1	18.307	4.169	.043	.024
Location	14.520	2	7.260	1.653	.194	.019
School_Type	3.424	2	1.712	.390	.678	.005
ICSEA_VALUE	.025	1	.025	.006	.939	.000
Indigenous_Students	15.827	1	15.827	3.604	.059	.021
Error	755.226	172	4.391			
Total	6710.178	180				
Corrected Total	891.058	179				

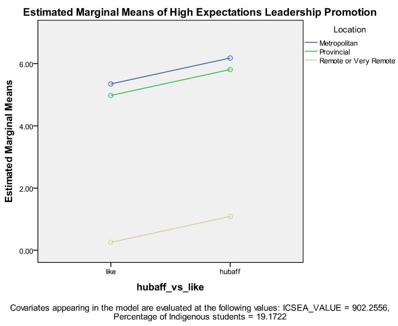

Figure 293 P-P Plot- Estimated Marginal Means of High Expectations Leadership Promotion

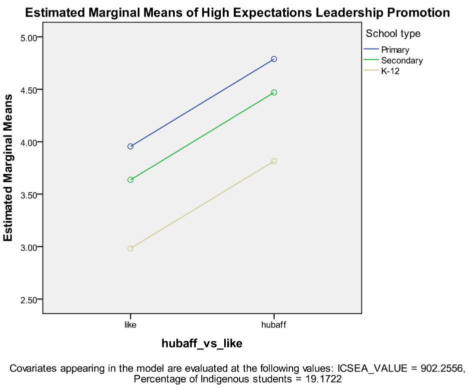

Figure 294 P-P Plot - Estimated Marginal Means of High Expectations Leadership Promotion

High Expectations Leadership Enactment

Table 209 Test Between-Subjects Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	44.445[a]	7	6.349	2.120	.044	.079
Intercept	18.518	1	18.518	6.184	.014	.035
hubaff_like	15.159	1	15.159	5.062	.026	.029
Location	5.970	2	2.985	.997	.371	.011
School_Type	2.003	2	1.002	.334	.716	.004
ICSEA_VALUE	4.701	1	4.701	1.570	.212	.009
Indigenous_Students	.715	1	.715	.239	.626	.001
Error	515.088	172	2.995			
Total	9582.965	180				
Corrected Total	559.533	179				

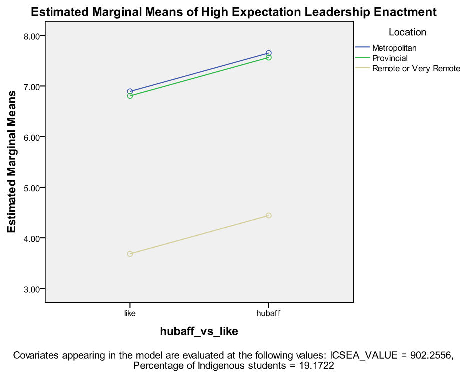

Figure 295 P-P Plot - Estimated Marginal Means of High Expectations Leadership Enactment

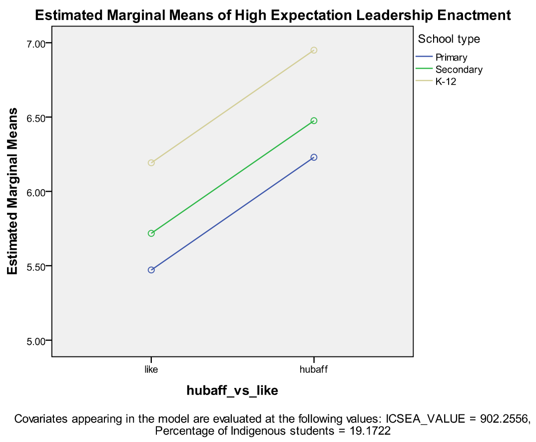

Figure 296 P-P Plot - Estimated Marginal Means of High Expectations Leadership Enactment

Indigenous Leadership

Table 210 Test of Between-Subjects Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	109.255[a]	7	15.608	2.537	.018	.117
Intercept	5.424	1	5.424	.882	.349	.007
hubaff_like	4.107	1	4.107	.667	.415	.005
Location	32.266	2	16.133	2.622	.076	.038
School_Type	19.043	2	9.522	1.548	.217	.023
ICSEA_VALUE	6.691	1	6.691	1.088	.299	.008
Indigenous_Students	47.980	1	47.980	7.798	.006	.055
Error	824.460	134	6.153			
Total	3078.382	142				
Corrected Total	933.714	141				

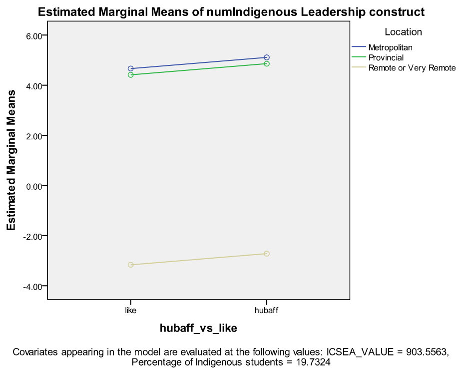

Figure 297 P-P Plot - Estimated Marginal Means of Indigenous Leadership Construct

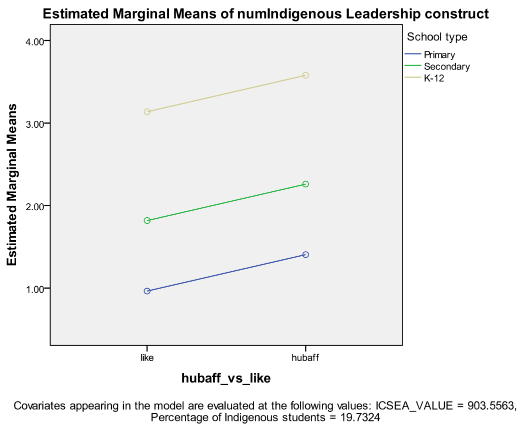

Figure 298 **P-P Plot - Estimated Marginal Means of Indigenous Leadership Construct**

Appendix 3.5 ANCOVA Analysis Constructs – Leaders Survey

Table 211 **Between-Subject Factors**

Between-Subjects Factors

		Value Label	N
LSID_SSLC_LIKE_D	.00	Like	34
	1.00	SSLC	53
LSMS_School type	1	Primary	49
	2	Secondary	26
	3	K-12	12
LSMS_Location Classification	1.00	Metropolitan	34
	2.00	Provincial	42
	3.00	Remote or Very Remote	11

Indigenous School Ethos

Table 212 Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	41.005[a]	7	5.858	2.884	.010	.204	20.190	.904
Intercept	9.171	1	9.171	4.515	.037	.054	4.515	.555
LSMS_Indigenous_Students	.102	1	.102	.050	.824	.001	.050	.056
LSMS_ICSEA_VALUE	.473	1	.473	.233	.631	.003	.233	.076
LSID_SSLC_LIKE_D	4.383	1	4.383	2.158	.146	.027	2.158	.306
LSID_PS	22.140	2	11.070	5.451	.006	.121	10.901	.835
LSMS_Location_R	1.934	2	.967	.476	.623	.012	.952	.125
Error	160.449	79	2.031					
Total	3662.376	87						
Corrected Total	201.454	86						

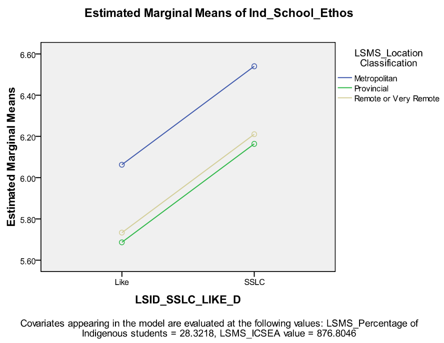

Figure 299 P-P Plot - Estimated Marginal Means of Indigenous School Ethos

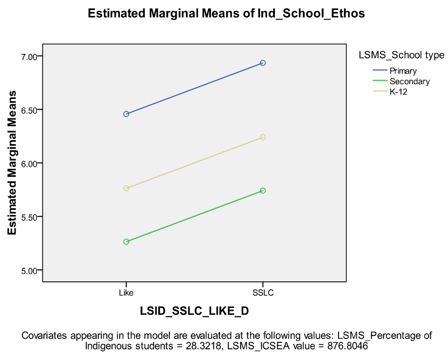

Figure 300 P-P Plot - Estimated Marginal Means of Indigenous School Ethos

School Governance and Community

Table 213 Test of Between-Subjects Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	124.799[a]	7	17.828	5.812	.000	.408	40.681	.998
Intercept	13.247	1	13.247	4.318	.042	.068	4.318	.534
LSMS_Indigenous_Students	.185	1	.185	.060	.807	.001	.060	.057
LSMS_ICSEA_VALUE	6.294	1	6.294	2.052	.157	.034	2.052	.291
LSID_SSLC_LIKE_D	21.172	1	21.172	6.901	.011	.105	6.901	.734
LSID_PS	10.520	2	5.260	1.715	.189	.055	3.429	.346
LSMS_Location_R	8.511	2	4.255	1.387	.258	.045	2.774	.287
Error	180.996	59	3.068					
Total	1440.494	67						
Corrected Total	305.795	66						

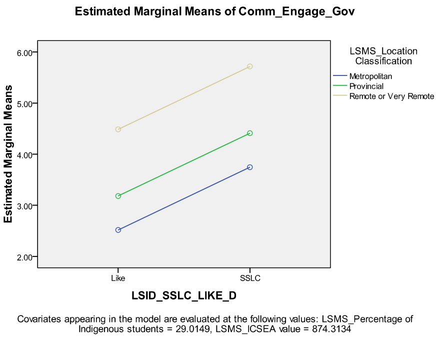

Figure 301 P-P Plot - Estimated Marginal Means of Community Engagement Governance

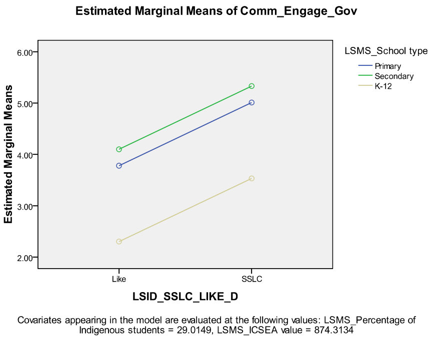

Figure 302 P-P Plot - Estimated Marginal Means of Community Engagement Governance

School Community Engagement

Table 214 Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	59.821[a]	7	8.546	3.116	.007	.270	21.812	.919
Intercept	29.203	1	29.203	10.648	.002	.153	10.648	.894
LSMS_Indigenous_Students	7.911	1	7.911	2.885	.095	.047	2.885	.386
LSMS_ICSEA_VALUE	16.182	1	16.182	5.900	.018	.091	5.900	.666
LSID_SSLC_LIKE_D	10.290	1	10.290	3.752	.058	.060	3.752	.478
LSID_PS	6.062	2	3.031	1.105	.338	.036	2.210	.235
LSMS_Location_R	11.154	2	5.577	2.033	.140	.064	4.067	.403
Error	161.808	59	2.743					
Total	1297.809	67						
Corrected Total	221.629	66						

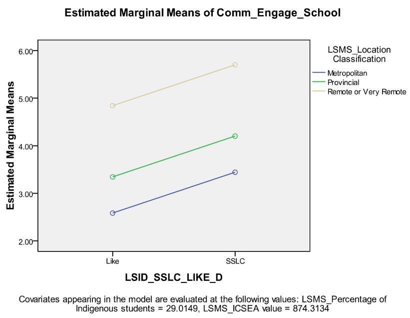

Figure 303 P-P Plot - Estimated Marginal Means of Community Engagement School

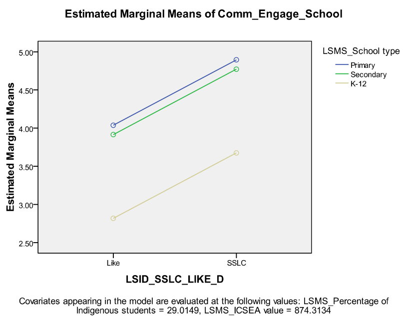

Figure 304 P-P Plot - Estimated Marginal Means of Community Engagement School

High Expectations Leadership Promotion

Table 215 **Tests of Between-Subjects Effects**

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	58.824[a]	7	8.403	3.110	.006	.225	21.772	.926
Intercept	7.425	1	7.425	2.748	.102	.035	2.748	.373
LSMS_Indigenous_Students	.023	1	.023	.008	.927	.000	.008	.051
LSMS_ICSEA_VALUE	.089	1	.089	.033	.857	.000	.033	.054
LSID_SSLC_LIKE_D	4.670	1	4.670	1.729	.193	.023	1.729	.255
LSID_PS	37.202	2	18.601	6.885	.002	.155	13.770	.913
LSMS_Location_R	.201	2	.101	.037	.963	.001	.074	.055
Error	202.633	75	2.702					
Total	3741.854	83						
Corrected Total	261.457	82						

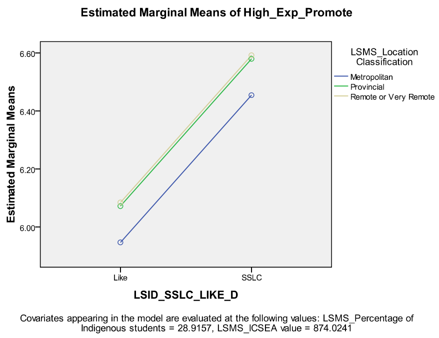

Figure 305 **P-P Plot - Estimated Marginal Means of High Expectations Promote**

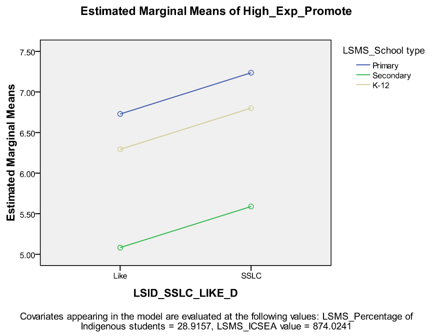

Figure 306 **P-P Plot - Estimated Marginal Means of High Expectations Promote**

High Expectations Leadership Enactment

Table 216 **Tests of Between-Subjects Effects**

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	58.436[a]	7	8.348	3.249	.005	.233	22.746	.938
Intercept	6.934	1	6.934	2.699	.105	.035	2.699	.368
LSMS_Indigenous_Students	.051	1	.051	.020	.888	.000	.020	.052
LSMS_ICSEA_VALUE	.072	1	.072	.028	.867	.000	.028	.053
LSID_SSLC_LIKE_D	4.807	1	4.807	1.871	.175	.024	1.871	.272
LSID_PS	45.600	2	22.800	8.875	.000	.191	17.750	.967
LSMS_Location_R	.255	2	.128	.050	.952	.001	.099	.057
Error	192.678	75	2.569					
Total	3465.038	83						
Corrected Total	251.114	82						

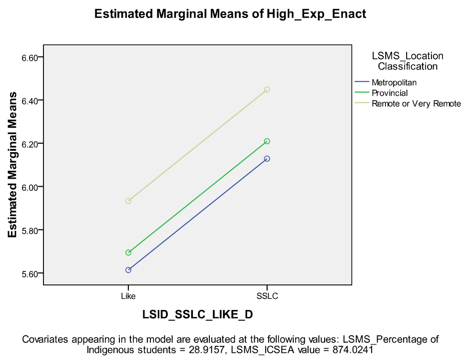

Figure 307 P-P Plot - Estimated Marginal Means of High Expectations Enact

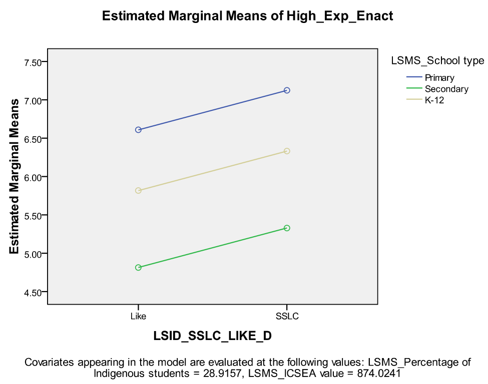

Figure 308 P-P Plot - Estimated Marginal Means of High Expectations Enact

Indigenous Leadership (Teaching)

Table 217 **Tests of Between-Subjects Effects**

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	48.922[a]	7	6.989	2.587	.019	.190	18.109	.863
Intercept	5.080	1	5.080	1.880	.174	.024	1.880	.273
LSMS_Indigenous_Students	1.182	1	1.182	.437	.510	.006	.437	.100
LSMS_ICSEA_VALUE	1.056	1	1.056	.391	.534	.005	.391	.095
LSID_SSLC_LIKE_D	8.745	1	8.745	3.237	.076	.040	3.237	.427
LSID_PS	.928	2	.464	.172	.843	.004	.344	.076
LSMS_Location_R	1.018	2	.509	.188	.829	.005	.377	.078
Error	208.018	77	2.702					
Total	1482.487	85						
Corrected Total	256.941	84						

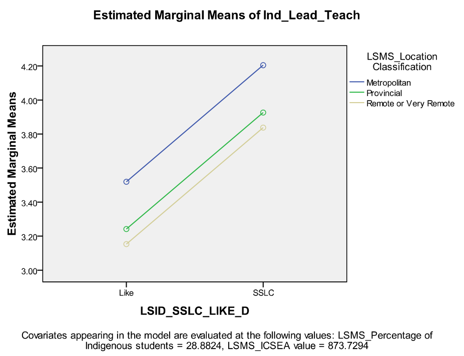

Figure 309 **P-P Plot - Estimated Marginal Means of Indigenous Leader Teachers**

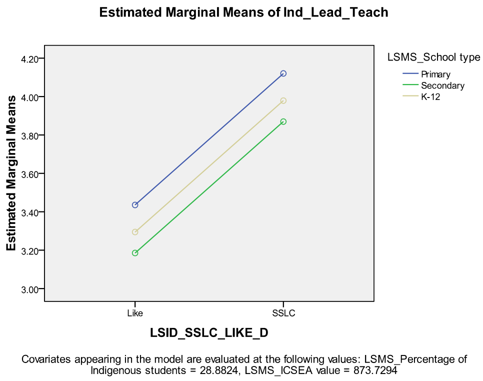

Figure 310 **P-P Plot - Estimated Marginal Means of Indigenous Leader Teachers**

Indigenous Leadership (Roles)

Table 218 **Tests of Between-Subjects Effects**

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	96.837[a]	7	13.834	5.014	.000	.313	35.099	.995
Intercept	5.529	1	5.529	2.004	.161	.025	2.004	.287
LSMS_Indigenous_Students	3.990	1	3.990	1.446	.233	.018	1.446	.221
LSMS_ICSEA_VALUE	1.739	1	1.739	.630	.430	.008	.630	.123
LSID_SSLC_LIKE_D	5.507	1	5.507	1.996	.162	.025	1.996	.287
LSID_PS	.422	2	.211	.077	.926	.002	.153	.061
LSMS_Location_R	2.168	2	1.084	.393	.676	.010	.786	.111
Error	212.438	77	2.759					
Total	1405.539	85						
Corrected Total	309.275	84						

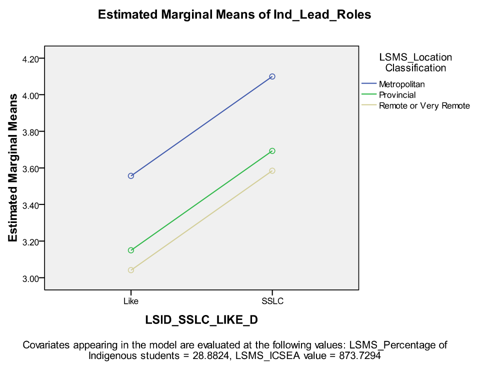

Figure 311 P-P Plot - Estimated Marginal Means of Indigenous Leader Roles

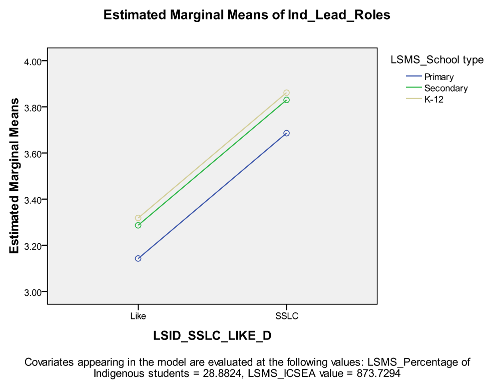

Figure 312 P-P Plot - Estimated Marginal Means of Indigenous Leader Roles

School Staffing (Recruitment)

Table 219 Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Dependent Variable:Sch_Staff_Recruit

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	153.746[a]	7	21.964	4.206	.001	.290	29.439	.982
Intercept	8.143	1	8.143	1.559	.216	.021	1.559	.234
LSMS_Indigenous_Students	5.741	1	5.741	1.099	.298	.015	1.099	.179
LSMS_ICSEA_VALUE	2.716	1	2.716	.520	.473	.007	.520	.110
LSID_SSLC_LIKE_D	29.317	1	29.317	5.614	.021	.072	5.614	.647
LSID_PS	3.000	2	1.500	.287	.751	.008	.574	.094
LSMS_Location_R	.608	2	.304	.058	.944	.002	.116	.058
Error	376.027	72	5.223					
Total	2229.978	80						
Corrected Total	529.773	79						

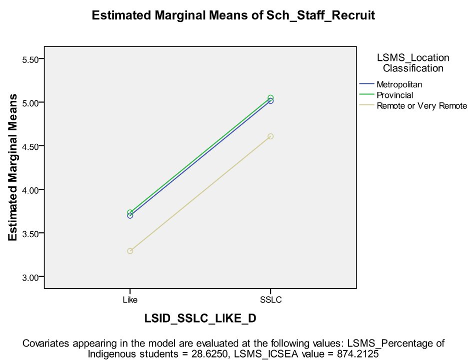

Figure 313 P-P Plot - Estimated Marginal Means of School Staff Recruitment

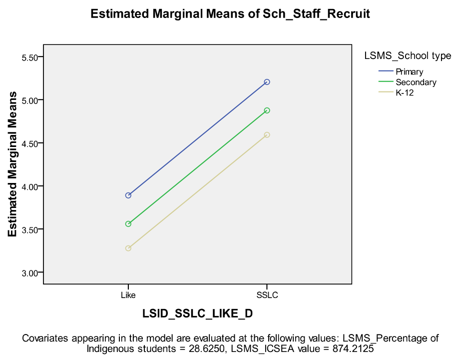

Figure 314 P-P Plot Estimated Marginal Means of School Staff Recruitment

Innovative School Staffing

Table 220 Tests of Between-Subject Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	109.444[a]	7	15.635	5.277	.000	.339	36.940	.996
Intercept	.338	1	.338	.114	.737	.002	.114	.063
LSMS_Indigenous_Students	16.121	1	16.121	5.441	.022	.070	5.441	.634
LSMS_ICSEA_VALUE	.128	1	.128	.043	.836	.001	.043	.055
LSID_SSLC_LIKE_D	11.347	1	11.347	3.830	.054	.051	3.830	.488
LSID_PS	10.542	2	5.271	1.779	.176	.047	3.558	.361
LSMS_Location_R	.376	2	.188	.063	.939	.002	.127	.059
Error	213.321	72	2.963					
Total	1582.812	80						
Corrected Total	322.766	79						

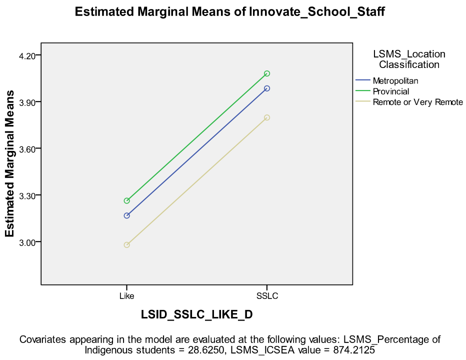

Figure 315 P-P Plot - Estimated Marginal Means of Innovate School Staff

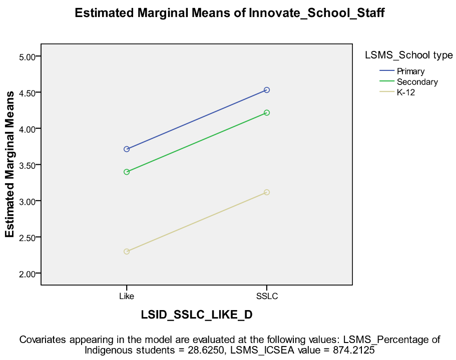

Figure 316 P-P Plot - Estimated Marginal Means of Innovate School Staff

Innovative School Modelling

Table 221 Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	122.896[a]	7	17.557	4.366	.000	.307	30.561	.986
Intercept	9.244	1	9.244	2.299	.134	.032	2.299	.321
LSMS_Indigenous_Students	.863	1	.863	.215	.645	.003	.215	.074
LSMS_ICSEA_VALUE	3.184	1	3.184	.792	.377	.011	.792	.142
LSID_SSLC_LIKE_D	45.665	1	45.665	11.355	.001	.141	11.355	.913
LSID_PS	7.956	2	3.978	.989	.377	.028	1.978	.216
LSMS_Location_R	3.339	2	1.669	.415	.662	.012	.830	.115
Error	277.474	69	4.021					
Total	1846.877	77						
Corrected Total	400.370	76						

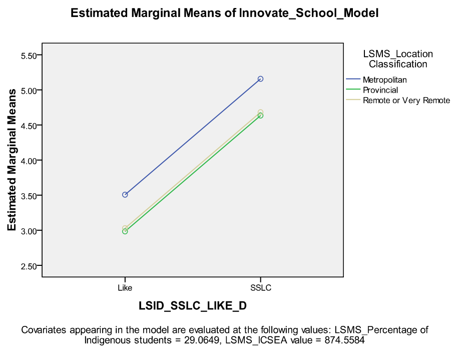

Figure 317 P-P Plot - Estimated Marginal Means of Innovate School Model

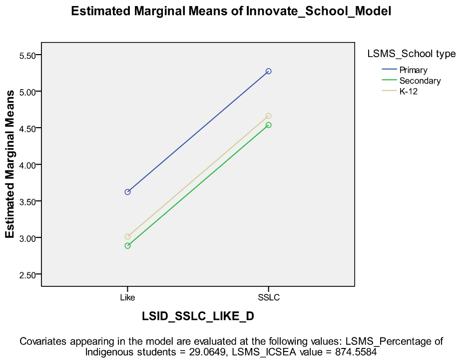

Figure 318 **P-p Plot - Estimated Marginal Means of Innovate School Model**

Sustainability (Teacher Deficit)

Table 222 **Tests of Between-Subjects Effects**

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	59.365[a]	7	8.481	2.569	.022	.234	17.983	.849
Intercept	.001	1	.001	.000	.989	.000	.000	.050
LSMS_Indigenous_Students	.644	1	.644	.195	.660	.003	.195	.072
LSMS_ICSEA_VALUE	2.599	1	2.599	.787	.379	.013	.787	.141
LSID_SSLC_LIKE_D	6.987	1	6.987	2.117	.151	.035	2.117	.299
LSID_PS	27.279	2	13.639	4.132	.021	.123	8.263	.709
LSMS_Location_R	3.849	2	1.925	.583	.561	.019	1.166	.142
Error	194.772	59	3.301					
Total	1352.821	67						
Corrected Total	254.137	66						

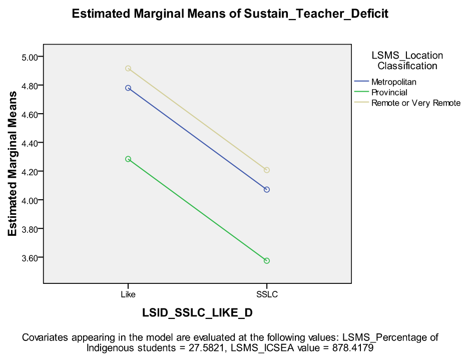

Figure 319 P-P Plot - Estimated Marginal Means of Sustain Teacher Deficit

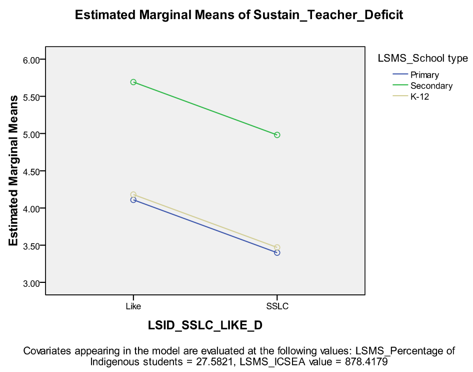

Figure 320 P-P Plot - Estimated Marginal Means of Sustain Teacher Deficit

Sustainability (Indigenous Education Deficit)

Table 223 Tests of Between-Subject Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	19.903[a]	7	2.843	.870	.535	.094	6.093	.342
Intercept	.123	1	.123	.038	.847	.001	.038	.054
LSMS_Indigenous_Students	7.303	1	7.303	2.236	.140	.037	2.236	.313
LSMS_ICSEA_VALUE	4.666	1	4.666	1.428	.237	.024	1.428	.217
LSID_SSLC_LIKE_D	.546	1	.546	.167	.684	.003	.167	.069
LSID_PS	6.323	2	3.162	.968	.386	.032	1.936	.210
LSMS_Location_R	.505	2	.253	.077	.926	.003	.155	.061
Error	192.731	59	3.267					
Total	1960.285	67						
Corrected Total	212.634	66						

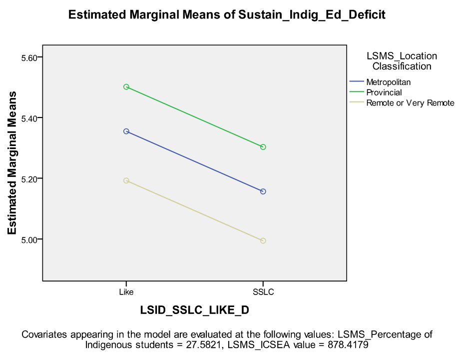

Figure 321 P-P Plot - Estimated Marginal Means of Sustain Indigenous Ed Deficit

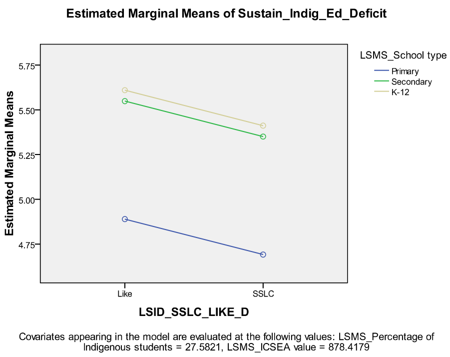

Figure 322 **P-P Plot - Estimated Marginal Means of Sustain Indigenous Ed Deficit**