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This is the author's version of a work that was submitted/accepted for publication in the following source:

Luke, Allan, Shield, Paul G., Theroux, Pamela, Tones, Megan, & Villegas, Malia (2012) *Knowing and teaching the indigenous other: teachers' engagement with Aboriginal and Torres Strait Islander cultures*. [Working Paper] (Submitted (not yet accepted for publication))

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Under review: *American Educational Research Journal*, 1/9/12

**Knowing and Teaching the Indigenous Other:
Teachers' Engagement with Aboriginal and Torres Strait Islander Cultures**

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ABSTRACT

This is the first empirical study of teacher knowledge and classroom practice in Aboriginal and Torres Strait Islander education. It describes the construction of a survey instrument to measure non-Indigenous Australian teachers' knowledge of Indigenous culture and place, frequency of everyday intercultural exchanges, and attempts to integrate Indigenous knowledge into classroom practice. Many teachers reported low levels of knowledge of Indigenous cultures, and limited encounters outside of school. While the cohort expressed dissatisfaction with pre-service training, exposure to pre- and in-service courses in Indigenous education correlated with higher levels of cultural knowledge and cultural engagement. Teachers with higher levels of cultural engagement were more likely to attempt to integrate Indigenous knowledges in curriculum and pedagogy.

KEYWORDS: Indigenous education, Australian education, Aboriginal and Torres Strait Education, Teacher Cultural Knowledge, Measurement of Cultural Competence, teacher education for diversity, multiculturalism

INTRODUCTION

This paper addresses the complex methodological and cultural questions about how to describe and measure teachers' self-reported knowledge of and engagement with Indigenous cultural Others. It provides an empirical description of Australian teachers' knowledge about and everyday interactions with Aboriginal and Torres Strait Islander communities and cultures, variable teacher demographic and training factors that influence that knowledge and practice, and impacts on their curriculum and pedagogical practices. We describe the design and findings of a survey that supplanted the traditional focus on attitudes and beliefs with grounded measures of reported practices with Indigenous cultures and communities.

We address three areas of concern that bring together persistent scientific and technical issues, pressing matters of school reform, and definitional issues of culture and standpoint. First, we raise the methodological and epistemological dilemma facing researchers dealing with cultural diversity in a range of national and regional contexts: What are the definitional and technical issues in documenting and measuring beliefs and attitudes, values and practices towards cultural 'Others' of a predominantly 'White' teaching workforce? Second, we take up the core challenge of teacher preparation for diversity: What background demographic, professional training and experience variables influence and shape teacher knowledge and practice with cultural Others? Third, we ask an applied question about Indigenous education reform: Does knowledge of Indigenous cultures and communities and everyday engagement with Indigenous communities influence teachers' approaches to curriculum and pedagogy? Responding to these issues, we present a new model for the measuring of teachers' cultural knowledge and engagement based on an original technical application of Rasch measurement.

The research questions, then, are:

- (1) How do we measure teachers' knowledge of and engagement with Indigenous cultural Others?
- (2) What are the self-reported levels of Australian teachers' knowledge of Indigenous culture and community and of their everyday contact and engagement with Indigenous peoples?
- (3) What variable education and training factors influence these levels?
- (4) How do these levels influence self-reported curriculum and pedagogy practices that attempt to embed Indigenous knowledges and cultural issues?

This paper, then, provides the first baseline descriptive data on the nexus of teacher cultural knowledge, experience and classroom practice in the contexts of Australian Indigenous education.

RESEARCH CONTEXT

This work developed as part of an Australian evaluation project of the *Stronger Smarter Learning Communities* (hereafter, *SSLC*). The cohort of 371 Australian teacher/respondents is drawn from a purposive sample of 87 schools serving Indigenous students and communities. In 2009 and 2010, these teachers completed a survey instrument on key themes and issues in Aboriginal and Islander school reform.

Begun in 2009, *SSLC* is the largest federally funded intervention (16.4 mil) in Australian education to date. The four-year project set out to establish a large-scale network of over 1690 schools unified around five key messages about school reform and the improvement of Indigenous student outcomes developed by Australian Aboriginal educator Chris Sarra (2005). These messages focus on the school-level promotion of: Indigenous identity; Indigenous

leadership; high expectations for learning and achievement; school/Indigenous community relations; innovative models of school reform; and innovative models of school staffing. On the basis of his experience as principal of Cherbourg State School, Sarra (2011) argues for a model of “high expectations leadership” that counters structural and personal racism against Aboriginal and Torres Strait Islander students. This model focuses on both non-Indigenous Australian and Indigenous school leaders – principals, community members, key teachers and others. It argues for the recognition of “positive models” of Indigenous identity; for the infusion of Indigenous staff in visible and influential roles; for the heightening of school and classroom expectations for achievement; and for the exploration of innovative and experimental approaches to school organisation, hiring, timetabling, structure, funding and reform. All this would occur in the context of substantive engagement with local Indigenous communities.

The program is implemented through a week-long residential training program that segues into voluntary membership and participation in a national school network. The network began in 2009 with 12 core “hub schools” and regional affiliates, and has expanded into approximately 60 hubs and over one hundred affiliates, with the support of state systems and Indigenous consultative bodies.

A multidisciplinary, Indigenous and non-Indigenous research team was assembled in 2010 to undertake a formative and summative evaluation of the program. The overall research design is cross-sectional, quasi-longitudinal and quasi-experimental. A multilevel analysis brings together systemic data on student attendance and achievement with principal and teacher survey data, with qualitative studies of 12 case study schools and 4 Indigenous communities.

This current paper reports on the teacher survey. The research team developed the survey items described. They were rigorously critiqued and reviewed by *SSLC* staff, the project's Indigenous reference group, and International research panel. They were then trialled and piloted with focus groups of teachers to establish their technical/scientific validity and the adequacy with which they addressed issues of cultural standpoint. The research reported here has followed recognised ethical protocols applying to Aboriginal and Torres Strait Islander topics, cultural contexts and, where appropriate, informants.

The first phase of the overall project was reported in Luke et al. (2011), describing the uptake of key messages and the challenges of translating changes in school ethos and Indigenous community engagement into substantive shifts in curriculum and pedagogy. The present paper does not present *SSLC* as a treatment factor. Its focus is on the measurement of teacher knowledge and engagement with Indigenous communities and cultures.

The research task, then, was: the design of a survey to measure a large cohort (n=371) of predominantly non-Indigenous Australian teachers' (97%) knowledge of Aboriginal and Torres Strait Islander knowledge, history and culture and everyday engagement with Indigenous people. The design began with a selected review of Australian and relevant international research on teacher cultural competence, then turning to define constructs of knowledge of Indigenous cultures prior to the development of survey items.

MEASURING TEACHERS' VIEWS OF CULTURAL OTHERS

How do we document and measure kinds and levels of what is variously termed cultural knowledge, intercultural competence and, more generally, the capacity of mainstream teachers to engage with cultural 'Others' – specifically Indigenous and racial/linguistic minority students?

There are ongoing attempts to theorise and describe the characteristics of the “multicultural”, “intercultural”, “cosmopolitan” and “transcultural” teacher as part of various normative educational approaches to diversity (e.g., Nieto, 2005; Luke & Goldstein, 2006; Marginson & Sawir, 2011; Quezada, Lindsey & Lindsey, 2012). Connolly (2007) and Phillips (2011) have undertaken qualitative studies of the engagement of White Australian pre-service and in-service teachers with Aboriginal and Torres Strait Islander culture, history and education. Amongst teacher educators and teacher education researchers, there is a general moral and political consensus on the need for teacher education more generally to prepare teachers to engage with and teach for cultural, linguistic and socioeconomic diversity (e.g., Cochran-Smith, 2000; Darling-Hammond & Bransford, 2005; Brayboy & Castagno, 2009; Hardee, Thompson, Jennings, Aragon & Brantmeier, 2012).

Yet the various ‘namings’ of the actual phenomenon in question (“intercultural competence”, “cultural competence”, “transculturalism”, “intercultural capital”) reflect varied and contending theories, definitions and approaches for educating cultural Others. These reflect a broad spectrum of political and cultural stances towards schooling in diverse societies, from liberal multiculturalism, to foci on postcolonial and intercultural cultural hybridity and exchange, to advocacy of recognitive social justice (e.g., Bishop & Glynn, 2003; Warriner, 2007; McLaren & Sleeter, 1995). When we venture further from current political and cultural debates over what is to be done about cultural Others in White-normative educational systems (e.g., Australia, New Zealand, the US and Canada) – into the technical question of how to measure capacities and engagements with Otherness, there is little methodological or ideological consensus about constructs and domains, instruments and items. Simply, it is extraordinarily difficult to measure a loosely defined phenomenon that sits at the interface of normative moral, social and educational

ideals about inclusion and social justice, in the face of the social facts of White educational hegemony and histories of racism and marginalization.

While teacher knowledge of and capacity with cultural Others appears to be crucial in increasingly diverse schools – the lack of empirical data leaves it ripe for mythology and misrecognition. There is little published work on the measurement of engagement with or knowledge of Indigenous communities, histories and cultures. A basic descriptive survey of white Australian pre-service teachers' views on Aboriginal and Torres Strait Islander culture, language and education was undertaken in the 1970s by Queensland researcher Diefenbach (2003). However, no comparable Australian work was undertaken over the subsequent decades.

The US *National Indian Education Study* (Moran & Rampey, 2008) developed survey items about Indigenous students' cultural engagement, including those related to use of Indigenous languages, participation in cultural events and ceremonies, and access to Elders and textual resources at school. The Australian *Dare to Lead* program (APAPDC, 2007) outlines model questions that school leaders and teachers can use for “acknowledging and celebrating” Indigenous cultures and “promoting understanding” of Indigenous Australia. Yet there are no currently available instruments for measuring non-Indigenous Australian teachers' knowledge of and everyday engagement with Indigenous cultures, and there is no technical, sociometric or psychometric literature on the topic.

The American literature on teacher cultural competence focuses on teacher and student deficit following what Sleeter (2001a) refers to as the “gap rationale”. The assumption is that the teaching force is largely White, female and middle class, while the student population is increasingly culturally diverse and effected by socioeconomic marginalisation (i.e., cultural gap);

hence, the need to increase teacher cultural competence to help students transition between home and school cultures (i.e., home/community/school gap); with the normative target of improving these same students' achievement in comparison with non-minority, middle and upper socioeconomic background cohorts on academic outcomes (achievement gap) (cf. Irvine, 2003). Policy makers typically call for interventions to help systems 'close the achievement gap': that is, to change the cultural and demographic selection and recruitment of teachers; to prepare teachers to be culturally competent through coursework and immersion experiences; and to call for targeted reform in funding, curriculum, class size and so forth (e.g., Melnick & Zeichner, 1998; Sleeter, 2001b). The American research, then, identifies three sites for the study and development of teacher cultural competence: teachers' own racial identity development, teachers' everyday and biographical experience of the Other, and the school contexts where teachers work with cultural Others.

The gap rationale frames cultural difference as a problem and focuses on changing what American teachers know and believe. It provides the programmatic basis for a host of coursework and practicum interventions in preservice teacher education aimed at expanding knowledge and understanding of cultural minority and majority communities of migrants, students of colour and Indigenous students (e.g., Hardee et al. 2012). Jean Phillips (2011) work on Australian undergraduate teacher preparation documents non-Indigenous student teachers' struggles to come to grips with cultural history, epistemic position and knowledge, their own and that of Indigenous Australians (cf. Phillips & Lampert, 2003). Furthermore, there is now two decades of critical ethnographic and action research that documents White teachers' beliefs about Others (e.g., Fine, Wong, Mun et al. 1992) and their collaborative attempts at critical pedagogies and teacher activism (e.g., Ngo & Kumishiro, 2005).

However, this normative emphasis on changing teachers' knowledge, attitudes and beliefs does not tell us what they actually know and how they come to know about cultural Others. More importantly, it does not deal with the principal problem that we have encountered in our larger evaluation study: the translation of self-reported changes in attitude and belief into systematic reform of the enacted curriculum of classroom teaching and learning (Luke et al., 2011).

American social psychologists have developed several scales for the assessment of the general populations' beliefs about race, culture, tolerance, racism and discrimination. These scales may be compromised by issues of construct validity and measurement error, compounded by the classical problem of "social desirability bias" (Furnham, 1986). Reviewing existing scales, Walker and Jussim (2002) question whether "people lie to appear unprejudiced". They proposed a "political correctness" scale to assess respondents' tendencies to "camouflage" discriminatory beliefs and attitudes. Explaining the "Bradley Effect" – in relation to African-American politician Thomas Bradley's unsuccessful 1986 run for governor of California – Stout and Kline (2008) explain this as "preference falsification" that occurs in survey research over issues of race and ethnicity.

The current study was undertaken in the aftermath of Australian Prime Minister Kevin Rudd's 2009 apology to Indigenous Australians and two decades of policy and media debate over reconciliation (e.g., Luke, 1997). Hence, we were aware that many non-Indigenous teacher/informants might find themselves in a situation of explicit normative expectations of 'correct' responses about Indigenous communities, cultures and languages. Many had been exposed to anti-racist messages, many were aware that governments, schools and teachers' unions explicitly stress social justice and Indigenous reconciliation, and most would know that

our research was designed to contribute to these goals. The practical difficulty, then, was to design survey items that did not tacitly encourage the reproduction of what might be perceived as ‘politically correct’ views – we use the term with requisite caution and irony.

At least in part the problem is the technical focus on psychologically defined attitudes and beliefs: that is, the focus on (racialization *qua*) internal mental states and self-professed subjectivity (Luke, 2009). In response, we turned to related American, Australian and New Zealand work on cultural pedagogies (e.g., Lee, 2001; Gonzales, Moll et al. 2005; McCarty, 2012; Bishop & Glynn, 2003). These models augment the focus on teacher beliefs and attitudes with a normative and programmatic focus on substantive knowledge of and everyday engagement with diversity. The shared assumption is that through meaningful engagement with, knowledge of, and experience of difference, teachers can be trained to teach through and with Others’ cultural resources, viewing these as forms of “productive diversity” (Kalantzis & Cope, 1990).

We used this rationale as the grounds for a shift in our approach. This entailed a deliberate conceptual and technical turn from measuring self-reported beliefs and attitudes about cultural Others to a focus on two constructs:

1. *Knowledge* of Indigenous history and culture, practice and language;
2. *Everyday engagement* with Indigenous peoples, communities and places.

Simply, rather than focusing on belief statements about race, Indigeneity, social justice and equity, we would focus on substantive content knowledge questions and specific accounts of what people did with Indigenous community members, students and Elders. The focus on everyday engagement, further, reflects the consistent theme in current work on Indigenous

standpoint and epistemology: that lived relations and protocols for place, peoples and community count in ways that often escape conventional Western, Eurocentric concepts of identity and ideology (Smith, 2005; Dehyle, Swisher, Stevens & Trinidad, 2008; Kovach, 2009; Martin, 2008). Our working hypothesis, further, was that greater knowledge and everyday engagement make a difference in the way that non-Indigenous teachers approach their teaching in terms of embedding Indigenous content, activities and perspectives into their classroom practices.

INSTRUMENTATION: CONSTRUCTS AND ITEMS

The *Dare to Lead* (APADAC, 2005) materials include a heuristic checklist for school leaders aiming to affirm Indigenous culture and history in their schools. This list includes the prominent display of Indigenous flags, art works and cultural artefacts, the active presence of Indigenous people in schools, and illustrations of school-level policy to support Aboriginal and Torres Strait Islander students, culture and learning. From this, and the aforementioned literature, we generated sub-categories of teacher knowledge of Indigenous cultures, communities and education:

- Knowledge of place (histories, geographies, place and languages);
- Knowledge of local community values and expectations, protocols and practices;
- Knowledge of Indigenous students' cultural experiences and aspirations;
- Knowledge of established teaching strategies in Indigenous education.

These are specialised variations of categories of teacher knowledge (e.g., Shulman, 1987): content knowledge (e.g., place, local values, practices), knowledge of learners (e.g., approaches to learning, background knowledge, aspirations), and pedagogical expertise (e.g., effective curriculum, pedagogy and assessment strategies). With a sense of the kinds of information we

hoped to collect on “knowledge”, the survey included four sections relevant to teacher cultural competence:

- 1) Teacher background – personal demographics and professional experience
- 2) Teacher engagement with Indigenous cultural knowledge
- 3) Teacher engagement with Indigenous community
- 4) Teacher pedagogic and curricular practice embedding Indigenous perspectives.

The teacher survey gathered baseline data on demographic background, levels of education and credential(s), and pre- and in-service training experiences – reported in the section on *Sample* below. The instrument then focused on three constructs: (1) teachers’ frequency of everyday contact with Indigenous community members; (2) sources of knowledge about Indigenous community and issues; (3) specific local knowledges. Constructs (1) and (2) were queried using self-reported frequency counts; the knowledge statements (3), were solicited both through Likert self-ratings of local knowledge and through short answers. This paper only reports on the self-rating items about local knowledge. The short, open-ended answers will be analysed thematically and through critical discourse analysis in a separate paper.

The first set of items asks respondents to report the frequency with which they have participated in specific activities with Indigenous community in the last six months (see Table 1 below):

Table 1: Teacher Engagement with Indigenous Community Questionnaire Items

<i>We are interested in your experiences related to Indigenous Cultural Knowledge and Community Engagement. Please indicate the frequency with which you have participated in the following activities in the last 6 months:</i>
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.

The frequency results were scaled into standardised scores. These were taken as self-reported levels of everyday practical engagement and exchange with Indigenous community members, Elders, parents, extended family and caregivers. Items 3 and 4 occur within the physical site of the school, while the other items mark engagement outside of the site and beyond formal institutional responsibility. To reiterate, by using self-reports of actual events and actions, behaviours and exchanges, the instrument attempted to address the problems of social desirability bias.

The next set of items shown in Table 2 attempted to plumb sources of knowledge about Indigenous history, community and culture. Teachers were asked to rate their participation in the following activities on a 9 point Likert scale from “1 - not much” to “9 - a lot”.

Table 2: Teacher Engagement with Indigenous Knowledge Questionnaire Items - Part I

Please indicate on the scale below to what degree the statements reflect your participation in the following activities	Your Current Situation (1 = "not much" to 9 = "a lot")								
	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.									

Indigenous media here refers to the dedicated Australian print media (e.g., *Koori Times*), specific broadcast media (National Indigenous Television (NITV), *Imparja*, Australian Broadcasting Corporation (ABC), Special Broadcasting Station (SBS)). In addition to asking about frequency and type of professional development, we also asked whether teachers had taken any pre- or in-service "courses" on Indigenous education and whether they were satisfied with them. This is taken both as a measure of training background and of the variable sources of knowledge about Indigenous history, culture and education.

In relation to knowledge of Indigenous cultures, communities and histories, teachers were asked for a Likert self-ranking of knowledge in two areas. These items are shown in Table 3:

Table 3: Teacher Engagement with Indigenous Knowledge Questionnaire Items - Part 2

<i>Please indicate on the scale below to what degree the statements reflect your knowledge of the following:</i>	Your Current Situation (1 = “not much” to 9 = “a lot”)								
	1	2	3	4	5	6	7	8	9
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.									

Finally, we asked a series of three specific short answer questions about local knowledge (see Table 4). Less than 50% of the total valid sample attempted to answer these questions.

Table 4: Teacher Engagement with Indigenous Knowledge Questionnaire Items - Part 3

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 need to know in order to teach Indigenous students?

The instrument included major sections for primary and secondary teachers to self-report on their curriculum and pedagogy. Items on pedagogy/curriculum attempted to capture the acknowledged paradigmatic families of classroom practice in Australian classrooms (e.g., basic skills, explicit instruction, grouping/streaming, canonical subject knowledge, critical literacy, progressive/child-centered approaches). The aim here was to study whether higher levels of knowledge and engagement with Indigenous community led to higher levels of self-reported practices with Indigenous knowledges in classrooms. Hence we focus here on the specific items

that highlighted the “embedding” of Indigenous perspectives and knowledge into the mainstream curriculum (see Table 5 below), a current focus in the development of Australian national curriculum¹:

Table 5: Teacher Pedagogical Practices for Embedding Community/Indigenous Perspectives

4.9a/b) Lessons and activities on local Indigenous knowledge in the curriculum (e.g., local history, cultural practices, Aboriginal and Islander terms and locations)
4.10a/b) Lessons or activities that involved study of local languages, Aboriginal English, and/or Torres Strait Islander Kriol
4.19a/b) Lessons and activities that involve the study and use of Indigenous literature (e.g., <i>Chant of Jimmy Blacksmith</i> , Sally Morgan, Glynnis Ward, Jackie Huggins, Berndt)
4.20a/b) Lessons and activities where issues of Indigenous identity were explored and discussed

SAMPLE

The survey was administered as part of a major program evaluation of Indigenous education reform. The sample population of primary (i.e., elementary) and secondary school teachers is not representative of the entire population of Australian teachers or of those responsible for the teaching of Aboriginal and Torres Strait Islander students per se. However, it is the largest national sample of teachers surveyed to date working with Indigenous students. The schools participating in this reform program – and the ‘matched schools’ selected for the larger study - cover the comprehensive range of state schools teaching Indigenous students. This range is from 1% to 100% in Indigenous enrolments, and it extends from suburban and urban schools to those in remote, Indigenous communities across all states.

¹ This has been mandated in the Australian Curriculum. See: http://www.acara.edu.au/curriculum/cross_curriculum_priorities.html. Retrieved 18/8/12.

The target population is based on individuals' identification as school teachers in an eligible school. Participants included those identified as teachers, teaching principals, heads of curriculum, and heads of secondary school departments. Eligible schools are defined as part of the reform initiative, or as a matched school comparable by student body, location and/or school type. A number of criteria were applied in the selection of comparative matched schools including institutional size and status, location, demographic and cultural comparability. The total number of valid respondents for the full sample was 391 working in 87 schools. Of this, a total of 283 teachers from 72 schools completed the Cultural Knowledge and Engagement section of the survey. Although comparisons of *SSLC* and non-*SSLC* matched schools were undertaken in the major evaluation study (Luke et al., 2011), our focus here is on an overall profile of Australian teachers working with Indigenous students rather than any treatment effects.

Because of the 2009-2010 focus of *SSLC* implementation, the majority of teachers in the sample were from either from the states of Queensland (47.7%) or New South Wales (33.6%). Most of the primary teachers were from New South Wales (40.8%), Queensland (24.5%) or Tasmania (19.4%), with fewer teachers from South Australia (7.1%), Western Australia (4.1%), Victoria (3.1%) or the Northern Territory (1.0%). Secondary teachers tended to be from Queensland (60%) or New South Wales (29.7%), with the remainder from Victoria (6.5%), Northern Territory (2.2%), Western Australia (1.1%) or Tasmania (0.5%).

Teacher Characteristics

The teacher sample was experienced: middle-aged, well credentialed, with over a decade of teaching experience; the majority reported an average of ten years in Indigenous school settings. The majority were female, spread across primary and secondary schools. The overall percentage

of teachers who identified as Indigenous was roughly comparable to the national population (3.5%). A small minority came from overseas, from North America, Asia, the Pacific, and the UK. Table 1 presents the basic demographic characteristics of the full teacher sample and of the sub-sample that completed the Cultural Engagement section of the survey.

TABLE 1. Basic Demographic Characteristics of Teachers in Full Sample and Sub-Sample of Teachers Who Completed the Cultural Engagement Section

Teacher Characteristics	Full Teacher Sample N = 371	Survey Sub-Sample N=283
Personal Demographics		
Female	69.3% (n=257)	69.3% (n=196)
Male	30.7% (n=114)	30.7% (n=87)
Age	M=40.46 SD 11.71 (n=366)	M=40.85 SD 11.70 (n=279)
Indigenous	3.5% (n=13)	3.5% (n=10)
Born Overseas	11.6% (n=43)	12.7% (n=36)
.....Language other than English	2.2% (n=8)	2.1% (n=6)
Professional Background/Experience		
Education < Bachelor (diploma)	3.8% (n=14)	3.5% (n=10)
Education = 3 year Bachelor	7.0% (n=26)	7.8% (n=22)
Education = 4 year B.Ed	80.3% (n=297)	79.8% (n=225)
Education >= M.A., Ph.D.	8.9% (n=33)	8.9% (n=25)
# years in teaching role	M=13.48 SD 11.13 (n=368)	M=13.86 SD 11.23 (n=280)
# years in current school	M=5.75 SD 5.93 (n=364)	M=6.14 SD 6.35 (n=278)
# years in Indigenous schools	M=9.50 SD 9.44 (n=367)	M=9.74 SD 9.61 (n=283)
# of schools worked in 5 years	M=2.19 SD 1.82 (n=371)	M=2.16 SD 1.82 (n=283)
Teach in Indigenous schools	93% (n=345)	97.9% (n=262)
Courses in Indigenous Ed.	28.6% = Yes (n=106)	30% = Yes (n=85)
School Context		
Location Urban/Metro	62.3% (n=231)	62.2% (n=176)
Location Regional/Provincial	31.8% (n=118)	32.9% (n=93)
Location Rural/Remote/Very Remote	5.9% (n=22)	4.9% (n=14)
% Indigenous Students in School	M=16.64 SD 21.14 (n=371)	M=16.31 SD 19.67 (n=283)

Primary School	28.6% (n=106)	31.1% (n=88)
....Secondary School	63.3% (n=235)	61.8% (n=175)
Combined K-12 School	8.1% (n=30)	7.1% (n=20)

Overall, there were no substantial differences between the full and sub-samples of teachers. The teachers in the sub-sample reported being in their current schools marginally longer than those in the full sample.

In the sub-sample of teachers who completed the Cultural Engagement section of the Teacher Survey, just over a third of teachers (34.6%) were primary teachers, and 69.3% were female. 3.5% of teachers sampled identified as Indigenous, while 12.7% were born overseas and 2.1% spoke a language other than English at home. The training and credential levels fit the typical profile of Australian schooling: 8.8% of participants held a postgraduate qualification, 79.5% had completed a four year bachelors' degree, and 7.8% held a minimal bachelors (three years), and 3.5% held a lower qualification.

Ages ranged from 22 to 65 years, with a mean age of 40.85 years (SD = 11.594). Experience was similarly varied, as teachers reported 0.5 to 43 years of teaching experience with a mean of 13.86 years (SD = 11.173). Teachers had spent fewer years in their current schools, ranging from 0.25 to 29 years with a mean of 6.14 years (SD = 6.325). Just over ninety percent (92.6%) of teachers reported having worked in a school with an Indigenous population. These teachers had worked from 0.25 to 39 years in Indigenous schools, with a mean duration of 10.49 years (SD = 9.660). On average, teachers had worked in 2 schools in the past 5 years.

Primary and secondary teachers differed on several demographic variables. *Notably, primary teachers were more likely to have completed a course (undergraduate or postgraduate,*

in-service or pre-service, in Indigenous education (41.8%) than secondary teachers (23.8%); ($X^2(1)= 9.936, p<.002$). Secondary teachers were more likely to have completed a Masters or PhD (11.4%) compared to 4.1% for primary teachers ($X^2(1)= 4.114, p<.043$). By contrast, primary teachers were more likely to have obtained a minimal bachelors (12.4%) compared to secondary teachers 5.4% ($X^2(1)= 4.293, p<.038$). Secondary teachers were more likely to be male (40.5%) than primary teachers 12.2% ($X^2(1)= 24.091, p<.001$), and more likely to report work experience in an Indigenous school 95.1% compared to 87.8% ($X^2(1)= 5.079, p<.024$).

The teacher sample has generally high levels of preservice training and high levels of experience in Indigenous education ($\bar{X}=9.74$; $SD=9.606$). This finding appears to contradict the myth that teachers working with Indigenous students tend to be young, inexperienced and with high levels of attrition and transfer. Nonetheless, of the total sample, *only 30% reported the completion of specific training in Indigenous education.* This includes both pre- and in-service coursework.

Findings on Teacher Cultural Engagement with Indigenous People/ Places and Indigenous Knowledge

On Cultural Engagement with Indigenous People, Places

Table 2 shows the percentage of teachers who report engagement with Indigenous community over the past six months, as well as means and standard deviations for the number of times an engagement activity took place. Means and standard deviations for self reported Likert-scale rankings of participation in cultural knowledge related activities are also reported in Table 2.

Apart from meeting with parents or caregivers, only about half of the teachers reported participation in cultural activities, with the lowest percentages noted for invitations to family or

community gatherings, visiting Indigenous organisations, and visiting the homes of Indigenous students.

The highest levels of everyday contact are affiliated with parent/caregiver/teacher meetings, part of teachers' formal work responsibilities. *Only slightly more than half of those teachers surveyed report having had any conversations, face-to-face exchanges or meals with Indigenous peoples.* Approximately 45% of teachers have no contact with Indigenous peoples outside of school, with less than 25% even having visited an Indigenous organisation. *Although we have no comparative data, these general descriptive findings suggest that slightly less than half of the teaching workforce teaching in schools with an Indigenous student population have, literally, no interactional contact or social relations with Indigenous peoples outside of the school.*

Table 2: Percentage and mean scores for participants engaging in community activities (based on number of times over last 6 months), and self reported cultural knowledge activities (based on a Likert scale of 1 “not much” to 9 “a lot”)

Community Engagement Activities	% None	% Any	If yes, Mean (SD) Range 0-180	Cultural Knowledge Activities	Mean (SD) Scale 1-9
5.1 – Conversation outside of school	45.2%	54.8%	28.03 (45.833)	5.9 – Read/ watch/ listen Indigenous media	3.96 (2.453)
5.2 – Invited to family/ community gathering	70%	30%	6.72 (27.273)	5.10 - Read research support Indigenous learning	4.55 (2.366)
5.3 - Participation in community events where I teach	53%	47%	5.47 (17.090)	5.11 - Professional development Indigenous student learning	4.58 (2.555)
5.4 - Met with parent/	25.8%	74.2%	11.82	5.12 - Familiar	4.31

caregiver of student			(7.22.392)	Indigenous history of community	(2.379)
5.5 - Visit home Indigenous student	86.2%	13.8%	9.59 (18.420)	5.13 - Familiar Indigenous geographies/ place names in community	4.08 (2.488)
5.6 - Conversation with parent/ caregiver (not behaviour/ progress)	47.3%	52.7%	13.40 (29.184)	5.14 - Pre-service education prepared me for support Indigenous learning	2.53 (2.317)
5.7 - Visit Indigenous organisations	77.7%	22.3%	5.67 (8.293)		
5.8 - Shared meal/ refreshments in social setting	44.9%	55.1%	14.77 (33.506)		

On Cultural Engagement with Indigenous Knowledges

In Table 2, the means for cultural knowledge items rest just below the half way mark of 5 on the 1-9 scale, with the standard deviations of >2 suggesting a reasonable variance across teachers in the study. The mean for engagement with Indigenous media is lower than that for engagement with professional development ($t(282) = -3.432, p < .001, r = .123$) and published research ($t(282) = -4.038, p < .000, r = .122$) on Aboriginal education. Noting the aforementioned lack of everyday Indigenous contact out of the school, these findings suggest that many teachers tend to derive what knowledge they report of Indigenous communities and issues from professional expert views, less so than directly from the Indigenous community and its media.

At the same time, the notable exception in Table 6 was responses to the question regarding pre-service education. *The low mean compared to the mean response on other items suggested that teachers felt that pre-service teacher education did not adequately prepare them to support Indigenous students' learning as compared to other learning opportunities* ($t_{5.9}(282)$)

= 7.717, $p < .000$, $r = .287$; $t_{5.10} (282) = 11.398$, $p < .000$, $r = .396$; $t_{5.11} (282) = 10.304$, $r = .387$).

This general level of dissatisfaction with pre-service training on Indigenous education is also reflected in the aforementioned finding that only 30% of the teachers had undertaken any pre or inservice courses with a specialised focus on Indigenous education. This is explored further in the discussion of teacher experience.

On Embedding Indigenous Content into Pedagogy

The Teacher Survey included a series of questions to measure teachers' self-reports of classroom practices. A total of 35 questions covered paradigmatic families of practices affiliated with models discussed in Australian teacher education, curriculum documents and policy debates: Basic Skills, Progressive, Canonical, Assessment, Classroom Management, Critical Literacy and Indigenous Pedagogy. These questions were exemplified for primary and secondary teachers using practical classroom-level examples. Primary and secondary teachers were asked to report on their inclusion of Indigenous perspectives in their pedagogical practices, with specific questions related to Indigenous knowledges, languages, literature, and discussion and exploration of Indigenous identity. The Indigenous pedagogy scale consisted of four items:

- 4.9a/b) Lessons and activities on local Indigenous knowledge in the curriculum (e.g., local history, cultural practices, Aboriginal and Islander terms and locations)
- 4.10a/b) Lessons or activities that involved study of local languages, Aboriginal English, and/or Torres Strait Islander Kriol
- 4.19a/b) Lessons and activities that involve the study and use of Indigenous literature (e.g., *Chant of Jimmy Blacksmith*, Sally Morgan, Glynnis Ward, Jackie Huggins, Larissa Berndt)

- 4.20a/b) Lessons and activities where issues of Indigenous identity were explored and discussed

Table 3 shows the percentage of primary and secondary teachers who reported participation in Indigenous pedagogy as described, as well as the mean and standard deviation for teachers who reported engaging in an Indigenous pedagogical activity. The mean and standard deviation refer to the number of minutes engaged in an activity per week, scaled as a percentage of a possible instructional time in a 1200 minute week. Curriculum embedding of local Indigenous knowledge and identity work were the most frequently reported activities for both primary and secondary teachers, however approximately 30% of primary teachers and 50% of secondary teachers reported no usage of the aforementioned Indigenous pedagogies in a typical week. On average, teachers are spending few if any minutes on these measures, with primary teachers averaging slightly more time than secondary teachers. For those teachers engaging in these activities, exploring Indigenous identity is more likely to be incorporated in both secondary and primary classrooms. Even so, the amount of reported minutes spent in Indigenous pedagogical activities per week amounts to little more than a small proportion of a single weekly lesson.

Table 3. Percentages of Teachers who Engaged in Indigenous Pedagogy Activities, and the Mean (SD) Minutes Spent on Each Activity per Week

	Primary			Secondary		Mean (SD)
	None	Any	If yes, Mean (SD)	None	Any	
Indigenous Curriculum	34.7%	65.3%	4.85 (5.370)	53.5%	46.5%	2.94 (4.172)
Indigenous Languages	83.7%	16.3%	3.96 (3.099)	91.4%	8.6%	3.01 (3.250)
Indigenous Literature	60.2%	39.8%	4.55 (4.422)	85.4%	14.6%	4.02 (4.545)
Indigenous Identity	51.0%	49.0%	4.53 (6.169)	61.1%	38.9%	4.50 (7.310)
Indigenous Pedagogies (Overall)	29.6%	70.4%	5.61 (9.052)	49.7%	50.3%	3.71 (7.889)

DESIGN AND ANALYSIS

Measurement Considerations

The theoretical and empirical redefinition of teacher cultural competence in terms of specific cultural knowledge and everyday social relations requires an exploratory approach to measurement. As noted, previous studies sought to measure teachers' own racial identity (including concepts of 'Whiteness'), knowledge of difference, and attitudes towards cultural Others. The teacher survey instrument focuses instead on documenting the teachers' countable experiences and their everyday face-to-face social relationships, recording specific knowledges and media use. The focus is on observable behaviours as indicators of aggregated constructs.

The questionnaire items were pooled into the two domains, knowledge engagement and people/place engagement. The two item sets were then modelled using a Rasch *partial credit model* (Masters, 1982). Rasch modelling, as a form of Item Response Theory (IRT), assumes a uni-dimensional structure where data are made to fit the model versus locating a *good fit* model to describe the data (Andrich, 1988). More powerfully, it generates a measure for each individual on each construct that is of interval level of measurement facilitating any further parametric analysis. Further, the Rasch model adjusts item fit for the influence of sample measures which produces sample free estimates. This is particularly important as the present sample is part of a longitudinal study where sample membership will be increased and time series calculations conducted. The Rasch modeling process for the engagement scales are discussed below. This is followed by a discussion of the findings from applying these per-person scores on engagement measures with teachers' propensity to undertake what we defined as Indigenous pedagogy practices.

Cultural Knowledge Six items were originally proposed to map the Cultural Knowledge scale.

Subsequent analysis using Rasch modelling found two items did not fit the model well. The scale was reduced to four items. These items are:

- (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.

The four items were found to fit the Indigenous Cultural Knowledge scale well. Overall model fit parameters are displayed in Table 4.

Table 4 – Model fit statistics

Overall model fit	Item Fit Residual Mean (SD)	Person Fit Residual Mean (SD)	Person Separation Index	Cronbach Alpha
$\chi^2(8) = 13.84$ $p = 0.086$	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 means and standard deviations are close to 0 and 1 respectively. This suggests no mis-fitting items and that 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, 2007). Cronbach Alpha is also a measure of internal consistency of the item group (Cronbach, 1951) with the 0.83 value being considered good for a four item set. Individual item fit statistics are presented in Table 5.

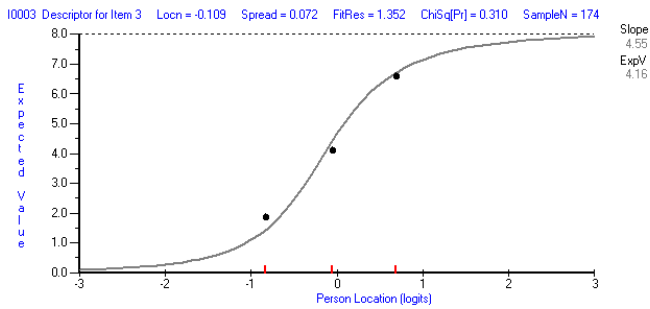
Table 5 – Individual item fit

Item	Location Value	SE	Fit Residual	χ^2	Prob
5.10	0.000	0.047	1.213	0.060	0.971
5.11	-0.109	0.043	1.353	2.344	0.340
5.12	0.033	0.048	-1.001	4.987	0.826
5.13	0.077	0.046	-1.048	6.452	0.040

Item locations allow the ordering of the items in terms of the relative likelihood of selection of high response categories. All items are very similar in this regard with item 5.11 (professional development) being the “most likely” to respond with a high category and 5.13 (Indigenous geographies and place names) the “least likely”. 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 indicated items had good discriminatory power. Item 5.11 slightly under estimates scores for the lowest group on the trait. This is indicated by one point being slightly off the curve (see Figure 1).

Figure 1 - Item Characteristic curve item 5.11



It is important that the measures used are appropriately targeted at the population being assessed. The Person-Item threshold distribution in Figure 2 shows item thresholds are generally spread along the continuum of traits. This conclusion is also supported by inspection of the Person Item Map (see Figure 3) that provides information about the relative likelihood of endorsing a particular response within an item. 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.

Figure 2 - Person Item Threshold Distribution

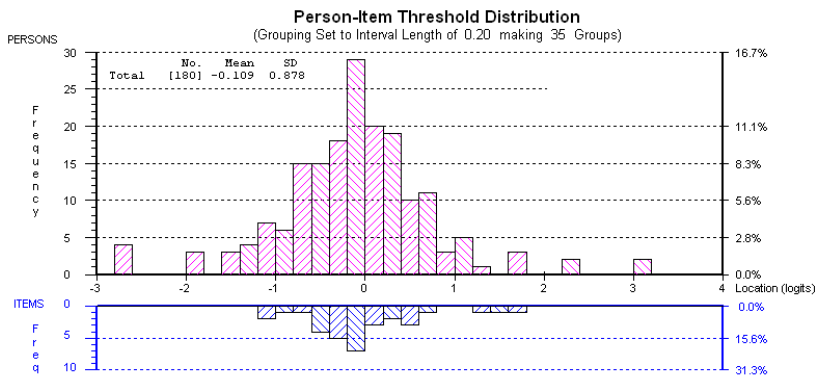
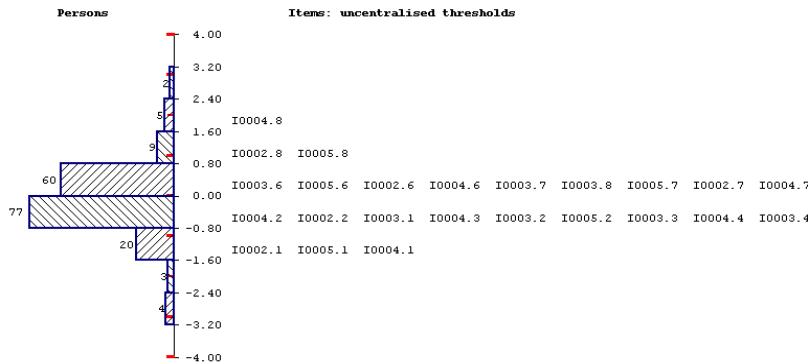


Figure 3 - Person Item map



It is imperative that the scale is measuring a single construct. To explore this, a Principal Components Analysis (PCA) analysis of the residuals was performed. The aim is to identify patterns of the residuals once the Rasch factor has been extracted. This is necessary 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 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 of <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 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.

In summary, a Rasch model was fitted to map the Indigenous Cultural Knowledge construct incorporating four items; 5.10, 5.11, 5.12, and 5.13. The data and items fitted the model well ($\chi^2(8) = 13.84, p = 0.086$) 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 an interval level of measurement and are therefore suitable for parametric analysis. A raw score to Rasch score conversion table was constructed and transformations then applied to the expanded data set used in subsequent analysis.

Engagement with Indigenous Community, Persons & Places

The eight items shown in Table 2 were proposed to map the Cultural Engagement scale. The items were scored as a frequency over a 6 month time interval; as a result the data spread roughly followed a Poisson distribution. This made it difficult to factor analyse or enter into a Rasch partial credit model. To overcome this restriction the data was transformed using a square root function. This had the effect of producing a more normal distribution and constraining the range. The transformed variable was then binned to produce ordinal categorical variables with four levels suitable for using in a Rasch analysis.

The eight items were then subjected to a principal components analysis (PCA) to assess if a factor structure was present. The correlation matrix revealed all correlations above 0.3 with

each item having higher correlations with 2 or more other items. The Kaiser-Meyer-Olkin value was 0.877 exceeding the recommended value of 0.6 (Kaiser, 1970) and Bartlett's Test of Sphericity (Bartlett, 1954) reached significance supporting the factorability of the correlation matrix.

PCA revealed the presence of a single factor explaining 51% of the variance. This was further supported by Parallel Analysis which showed only one component exceeding the criterion values for a randomly generated matrix of the same size.

Given the PCA supported an argument for uni-dimensionality of the component structure it was decided to fit a Rasch partial credit model to the 8 item set proposed to map the Indigenous Community Engagement construct. The eight items were found to fit the Indigenous Community Engagement scale well. Overall model fit parameters are displayed in Table 6.

Table 6 – Model fit statistics

Overall model fit	Item Fit Residual Mean (SD)	Person Fit Residual Mean (SD)	Person Separation Index	Cronbach Alpha
χ^2 (24) = 27.673 $p = 0.274$	-0.656(0.699)	-0.423(0.899)	0.760(with extremes) 0.750 (no extremes)	0.858(with extremes) 0.846(no extremes)

The chi-square probability is greater than the Bonferroni adjusted value of 0.006 indicating good overall fit. The item and person fit 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 0.76 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 0.858

value being considered good for an 8 item set (Cronbach, 1951). Individual item fit statistics are presented in Table 7.

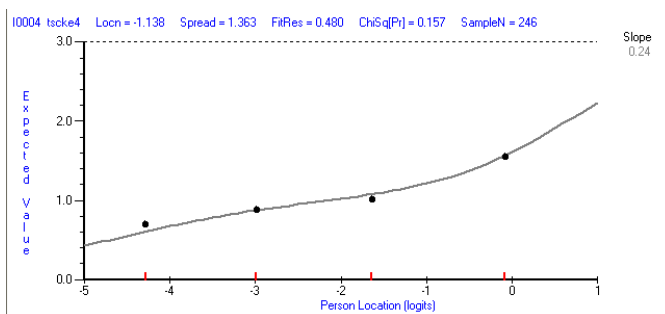
Table 7 – Individual item fit

Item	Location Value	SE	Fit Residual	χ^2	Prob
5.1	-0.424	0.118	-0.599	2.191	0.534
5.2	0.363	0.128	-1.218	4.004	0.261
5.3	-0.175	0.126	-0.756	3.351	0.341
5.4	-1.138	0.13	0.48	5.21	0.157
5.5	1.018	0.164	-1.617	2.562	0.464
5.6	-0.176	0.13	-0.686	6.502	0.090
5.7	0.277	0.128	-1.047	2.27	0.518
5.8	0.255	0.136	0.197	1.584	0.663

Item locations allow the ordering of the items in terms of the relative likelihood of selection of high response categories. All items are very similar in this regard with item 5.4 (Met with parent/caregiver of student) being the “most likely to register a high category” to respond with a high category and 5.5 (Visit home Indigenous student) the “least likely”. The Fit Residuals (<1.5), χ^2 and probability values (>0.006 - Bonferroni adjusted) all indicate good individual item fit.

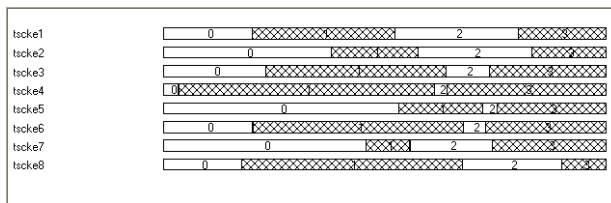
Inspection of the Item Characteristic curves indicated items had good discriminatory power. Curves of all items were similar to that of 5.4 illustrated in Figure 4.

Figure 4- Item Characteristic curve TSCKE4



There was no indication of disordered thresholds across the 8 items as illustrated in the threshold map (see Figure 5). This implies that respondents with high levels of Community Engagement would endorse high scoring response options while respondents with low levels of Community Engagement would endorse low scoring responses.

Figure 5 – Item Threshold Map



The Person-Item threshold distribution in Figure 3 shows item thresholds are generally spread along the continuum of traits. This conclusion is also supported by inspection of the Person Item Map (see Figure 7) that gives information about the relative likelihood of response to the items against the distribution of respondents. There is some clustering at the lower end suggesting a “floor” effect but this is a function of the binning process used to generate ordinal categories from count data. The lowest category was “zero counts”, with no possibility of lower responses.

Figure 6 - Person Item Threshold Distribution

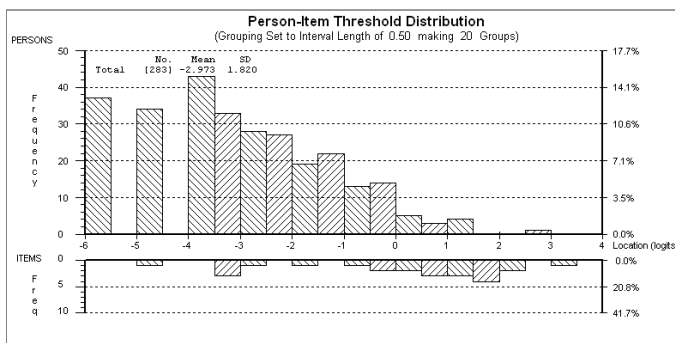
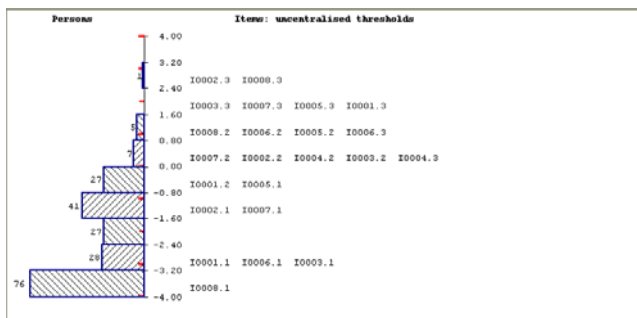


Figure 7 - Person Item Map



Again, it is imperative that the scale is measuring a single construct. Similar to the Cultural Knowledge construct, a Principal Components Analysis (PCA) analysis of the residuals was performed to test this assumption. Independent t-tests showed the Indigenous Community Engagement scale to be uni-dimensional (function 0.61% , 95% CI 0.077 – 0.144%). Furthermore, there were no positive residual correlations noticeably larger than the other correlations in the scale with correlations in the range -0.298 to 0.03. Hence there was no evidence of response dependency in any of the items.

In summary, a Rasch model was fitted to map the Community Engagement construct incorporating eight items: 5.1 to 5.8. The data and items fitted the model well ($\chi^2(24) = 27.673$, $p = 0.274$) with adequate measures of internal consistency; Person Separation Index (0.760) and Cronbach alpha (0.858). 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 parametric analysis. A raw score to Rasch score conversion table was constructed and transformations then applied to the expanded data set used in subsequent analysis.

Two multiple regression analyses were conducted to determine the impact of a series of school variables (proportion Indigenous enrolments and remoteness) and teacher variables (education and experience teaching in Indigenous schools) on the community engagement and cultural knowledge constructs. These two constructs were then evaluated against a series of items measuring Indigenous pedagogy via a two way contingency table and logistic regression.

RESULTS

The two domains - teachers' engagement with cultural others and their engagement with Indigenous knowledges - were influenced by teacher education and experiences and by the percentage of Indigenous students in the school. Both cultural knowledge and engagement impacted each Indigenous pedagogical practice. However, *only community engagement predicted whether or not teachers included Indigenous pedagogical practices overall when teacher and school background variables were accounted for in the logistic regression.*

On Community Engagement

A multiple regression analysis was conducted to determine whether percentage of Indigenous students enrolled, school location, teacher level (primary or secondary), years experience teaching in Indigenous schools, highest level of formal education and participation in an Indigenous course impacted community engagement.

The linear combination of the above variables was significantly related to the level of community engagement, $F(6, 271) = 14.971, p < .000$, and explained 24.9% of the variance in community engagement response scores ($R = .499, R^2 = .249, Adj R^2 = .232$). The squared partial correlation was utilised as a measure of effect size for individual predictors. This measures the proportion of variance in the dependent variable explained by the independent variable

controlling for all the other independent variables. Table 8 illustrates the effects of the school and teacher predictor variables on cultural engagement. Percentage of Indigenous students was the strongest predictor of community engagement ($\beta_{\% \text{ Indigenous students}} = .390, t = 6.158, p = .000, pr = 0.350$) and explained 12.3% of the variance in teacher responses. All teacher experience and education variables impacted community engagement ($\beta_{\text{ Indigenous learning courses}} = .162, t = 2.981, p = .003, pr = 0.178$; $\beta_{\text{ highest level formal education}} = .143, t = 2.641, p = .009, pr = 0.158$; $\beta_{\text{ years teaching}} = .267, t = 4.921, p = .000, pr = 0.286$) as courses to support Indigenous student learning, highest level of education and years teaching in Indigenous schools accounted 3.2%, 2.5% and 8.2% of the variance in community engagement respectively. While these effect sizes appear small, they represent the effect of the independent variable while controlling for all other independent variables. As such, they mark the unique contribution of that indicator to the explanatory model. These small independent effects are however contextually important as their impact is cumulative as evidenced by the variance explained in community engagement scores by the complete model.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
(Constant)	-5.690	.614		-9.265***	.000			
Percentage Indigenous Students	.036	.006	.390	6.158***	.000	.381	.350	.324
Highest degree/ credential	.470	.178	.143	2.641**	.009	.092	.158	.139
Years worked in Indigenous school	.050	.010	.267	4.921***	.000	.199	.286	.259
Courses support Indigenous education	.636	.213	.162	2.981**	.003	.234	.178	.157
Metropolitan vs provincial/ remote location	.124	.225	.033	.550	.583	-.178	.033	.029
Primary vs secondary school level	.051	.219	.013	.231	.817	.161	.014	.012

Table 8 - Effects of School and Teacher Variables on Cultural Engagemen

* $p < .05$. ** $p < .01$. *** $p < .001$.

$F(6, 271) = 14.971, p < .000$.

On Cultural Knowledge

A multiple regression was conducted to determine whether percentage of Indigenous students enrolled, school location, teacher level (primary or secondary), years experience teaching in Indigenous schools, highest level of formal education and participation in an Indigenous course impacted on levels of cultural knowledge.

The linear combination of the above variables was significantly related to cultural knowledge, $F(6, 271) = 7.010, p < .000$, and explained 13.4% of the variance in cultural knowledge response scores ($R = .367, R^2 = .134, Adj R^2 = .115$). The impact of school and teacher predictors on cultural knowledge is shown in Table 13. Participation in a course to support Indigenous student learning was the strongest predictor of cultural knowledge ($\beta = .214, t = 3.669, p = .000, pr = 0.218$), explaining 4.8% of the variance in Cultural Knowledge scores closely followed by experience teaching in Indigenous schools ($\beta = .212, t = 3.637, p = .000, pr = 0.216$) explaining a further 4.7%. Highest level of education ($\beta = .130, t = 2.244, p = .026, pr = 0.135$), and percentage of Indigenous enrolments ($\beta = .140, t = 2.053, p = .041, pr = 0.124$) all emerged as statistically significant explanatory variables accounting uniquely for 1.8% and 1.5% respectively. Given the very small effect sizes of these latter variables it is unlikely they could be considered contextually important. The impact of the percentage of Indigenous student enrolments on teacher cultural knowledge was small.

Table 9 - Effects of teacher and school variables on cultural knowledge

S	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
(Constant)	-.903	.317		-2.848	.005			
Percentage Indigenous Students	.006	.003	.140	2.053	.041	.170	.124	.116
Highest degree/ credential	.206	.092	.130	2.244	.026	.089	.135	.127
Years worked in Indigenous school	.019	.005	.212	3.637	.000	.170	.216	.206
Courses support Indigenous education	.404	.110	.214	3.669	.000	.253	.218	.207
Metropolitan vs provincial/ remote location	.048	.116	.027	.413	.680	-.082	.025	.023
Primary vs secondary school level	.139	.113	.076	1.226	.221	.146	.074	.069

* $p < .05$. ** $p < .01$. *** $p < .001$.

$F(6, 271) = 7.010, p < .000$.

FINDINGS ON THE TRANSLATION OF KNOWLEDGE AND ENGAGEMENT INTO CLASSROOM PRACTICE

A series of two-way contingency tables were obtained to determine the impact of cultural knowledge and engagement as measured by the Rasch scores on the Indigenous pedagogy items. In each case, the Rasch score served as the independent variable and the pedagogy questions served dependent variables. As noted in Table 3 above, the amount of reported time dedicated to these pedagogical activities ranged from a few minutes to one hour per week. Due to the limited range in pedagogical activities, pedagogy questions were recoded as dichotomous variables (Any/None). In Table 10 below, the effect sizes (eta squared) are reported for the relationship of teachers' engagement with Indigenous knowledges, peoples and pedagogical practices.

The effect sizes for primary teachers on all pedagogical indicators are stronger than for secondary teachers, reaching a moderate level. For primary teachers, knowledge had a slightly

greater impact than engagement on whether teachers incorporated Indigenous perspectives into curriculum, literature and identity. Engagement was more relevant than knowledge for the use of Indigenous languages in the classroom for primary and secondary teachers, however effects were small. While the knowledge and engagement scores had only a small impact on secondary teachers' use of Indigenous pedagogies, engagement mattered more than knowledge for Indigenous literature, while the opposite was observed for both curriculum and identity.

Table 10 - Effects of Relationship between Cultural Knowledge and Community Engagement and Indigenous Pedagogical Practices for Primary and Secondary Teacher

Variable	Primary		Secondary	
	Cultural Knowledge	Community Engagement	Cultural Knowledge	Community Engagement
	η (η^2)	η (η^2)	η (η^2)	η (η^2)
Indigenous Curriculum	.583 (.340)	.565 (.319)	.378 (.143)	.339 (.115)
Indigenous Language	.514 (.264)	.531 (.282)	.440 (.194)	.485 (.235)
Indigenous Literature	.549 (.301)	.527 (.278)	.428 (.183)	.480 (.230)
Indigenous Identity	.675 (.456)	.616 (.379)	.468 (.219)	.398 (.158)

These findings indicate that both knowledge and engagement affect pedagogy, a finding which was explored via logistic regression. An omnibus Indigenous pedagogies variable was created where teachers who indicated any of the four activities (curriculum, language, literature and identity) were coded as incorporating Indigenous pedagogies – “Any”. Teachers who did not report any Indigenous pedagogy activities were coded as “None.”

Logistic Regression

A two-step logistic regression was conducted to determine whether teachers' cultural knowledge and community engagement scores significantly forecasted the uptake of Indigenous pedagogies over and above the teacher and school variables described earlier. In order to achieve this, the background variables (teacher experience and education, the school's percent Indigenous student

population and location) were entered into the first step of a logistic regression with Indigenous pedagogy as the outcome variable. Cultural knowledge and community engagement scores were added in the second step.

Both models attained overall significance ($\chi^2_{\text{Model 1}}(6) = 24.959, p < .000$; $\chi^2_{\text{Model 2}}(8) = 42.189, p < .000$). However model 2 more correctly classified teachers based on whether they incorporated Indigenous pedagogies into their classroom [Nagelkerke pseudo R^2 ($R^2_{\text{Model 1}} = .115$; $R^2_{\text{Model 2}} = .189$)]. Specifically, the second model correctly classified 65.1% of cases, compared to 57.6% for the first model, as shown in Table 11.

Table 11 - Classification of Teachers' Indigenous Pedagogy use in the classroom

<i>Teachers Observed versus Predicted usage of Indigenous Pedagogies in the Classroom</i>		<i>Percentage Correct</i>		
<i>Observed</i>	<i>Predicted</i>			
	<i>None</i>	<i>Any</i>		
<i>Model 1</i>	<i>None</i>	53	65	44.9%
	<i>Any</i>	53	107	66.9%
	<i>Overall</i>			57.6%
<i>Model 2</i>	<i>None</i>	68	50	57.6%
	<i>Any</i>	47	113	70.6%
	<i>Overall</i>			65.1%

Table 12 shows the independent variables input into the first step of the logistic regression model. Two variables were significant, teacher level (Wald $\chi^2(1) = 3.868, p < .05$) and teacher participation in courses to support Indigenous learning (Wald $\chi^2(1) = 5.025, p < .05$). Odds ratios indicate that *incorporating Indigenous pedagogies into the classroom was nearly twice as likely for teachers who had completed a course to support Indigenous student learning in comparison to teachers who had not completed such a course* (O. R. = 1.933) and amongst primary teachers compared to secondary teachers (O. R. = 1.812). It was surprising to note that school context and teacher experience in Indigenous schools did not influence Indigenous pedagogy usage.

Table 12 - Model 1 Predictors of Indigenous Pedagogy Incorporation: School Teacher and Context Variables

	B	S.E.	Wald	df	Sig.	Exp(B)
School Level: Primary /Secondary(1)	.595	.302	3.868	1	.049	1.812
Indigenous Course(1)	.659	.294	5.024	1	.025	1.933
Location: Metro_Vs_Other(1)	-.103	.297	.120	1	.728	.902
% Indigenous_Students	.016	.009	3.062	1	.080	1.017
Teacher Education	.147	.235	.391	1	.532	1.159
Teacher Years in Indigenous	.016	.014	1.280	1	.258	1.016
Constant	-.837	.814	1.058	1	.304	.433

Table 13 shows the predictors of incorporating Indigenous pedagogy into classroom practice for model 2. Community engagement is the only significant predictor in the model (Wald $\chi^2(1) = 5.746, p < .05$). The odds ratio for community engagement indicates that the likelihood of a teacher including Indigenous pedagogies in the classroom increases by 1.26 times with each interval increase in their community engagement Rasch score. There were also trends for cultural knowledge (Wald $\chi^2(1) = 3.110, p > .05$) and teacher level (Wald $\chi^2(1) = 3.375, p > .05$) in this model. *These findings demonstrate that engagement with Indigenous people and places is the single most important teacher variable in predicting the incorporation of Indigenous pedagogies.* However, Cultural Knowledge also had a noteworthy effect on pedagogy, as the odds ratio indicates that the probability of a teacher involving Indigenous pedagogies in the classroom increases by 1.44 times with each interval increment in their cultural knowledge Rasch score.

Table 13 - Model 2 Predictors of Indigenous Pedagogy Incorporation: School Teacher and Context Variables, and Cultural Knowledge and Community Engagement Rasch Scores

	B	S.E.	Wald	df	Sig.	Exp(B)
School Level: Primary /Secondary(1)	.576	.313	3.375	1	.066	1.778
Indigenous Course (1)	.422	.309	1.865	1	.172	1.525
Location: Metro_Vs_Other(1)	-.120	.307	.153	1	.695	.887
% Indigenous_Students	.006	.010	.394	1	.530	1.006

Teacher Education	-.018	.247	.005	1	.943	.982
Teacher Years in Indigenous	-.001	.015	.005	1	.945	.999
CULT_KNOW_RASCH	.365	.207	3.110	1	.078	1.441
CULT_ENGAGE_RASC H	.231	.096	5.746	1	.017	1.259
Constant	.704	.971	.526	1	.468	2.022

As identified in the linear regressions above, both cultural knowledge and community engagement were explained by a constellation of variables including teacher education level, participation in courses to support Indigenous students, experience teaching in Indigenous schools, and percentage of Indigenous students in the school. The teachers who indicate high levels of knowledge and engagement therefore have a foundation of education and experience to support Indigenous student learning. These teachers are also engaged with Indigenous students in their schools, and therefore may be expected to have the opportunity to engage with Indigenous community members and build their knowledge, and to engage with student background knowledge. *However, community engagement has emerged as the most important predictor of a teacher's likelihood to incorporate Indigenous pedagogies.* Activities such as meeting with parents and attending local Indigenous events appearing to enable them to contextualise their knowledge to meet the educational needs of students in their classroom. *While courses may be extremely important in building cultural knowledge, generalised education in Indigenous student learning may be difficult to apply to classroom settings if the teacher does not actively engage with Indigenous community outside of the school.*

CONCLUSION: TRAINING, KNOWLEDGE AND ENGAGEMENT MAKE A DIFFERENCE

If indeed there is a broad consensus of the Indigenous and non-Indigenous researchers cited and reviewed here that “culture counts” (Bishop & Glynn, 2003) – there is less empirical evidence on exactly how, in what ways, and to what ends it counts in the practices of a non-Indigenous teaching workforce. We began this paper describing the methodological and cultural issues facing the measurement of cultural competence of a predominately non-Indigenous teaching workforce responsible for the education of Indigenous students. We examined the limits of a focus on teacher beliefs and values about a racialised Other, and made the conceptual and technical case for the measurement of teacher content knowledge about Indigenous culture, place and language, and for the measurement of everyday engagement with Indigenous community members, families, Elders, parents, students and caregivers.

Our findings provide the first descriptive baseline on the relationships between levels of knowledge of Indigenous cultural others and engagement with Indigenous Australian communities, on the one hand, and self-reported attempts to engage with Aboriginal and Torres Strait Islander knowledge, culture, history and issues in pedagogy and curriculum. Principals, teachers, teacher educators, researchers and policy makers working in the contexts of Indigenous education will find many of the empirical claims here intuitive and practical: that experience makes a difference, that specialised training in Indigenous education makes a difference, and that heightened levels of local knowledge and everyday engagement with Indigenous peoples are likely to work hand-in-glove with teacher efforts to reform and revise the curriculum to engage with Indigenous cultures, knowledges and histories. Further, it is worth noting that a significant

majority of this teacher cohort views their pre-service training on matters of Indigenous education as inadequate preparation for teaching Indigenous students.

There are several other findings here that warrant the attention of all parties involved in Aboriginal and Torres Strait Islander education. The overall levels of credentials, age, and prior experience in Indigenous education of this sample of teachers were generally high – with average experience levels of over a decade. At the same time, there is more continuity in the composite workforce than commonly believed, with teachers averaging 2 school placements in the past 5 years. This does not discount the effects of staff turnover in rural and remote areas, an area of continuing concern to Australian state systems, principals and teachers' unions. But given that the majority of Indigenous students are now educated in urban and suburban settings where they are minorities of the student body (MCEECDYA, 2010) - inexperience, transience or lack of qualifications of the teaching workforce would not appear to be the core problem.

This said – and although we lack any comparative benchmark - the overall levels of knowledge of Indigenous culture, history and language appear to be low. At this point, we have indirect indicators only. Only 46% of those who completed the Cultural Knowledge and Community Engagement section of the survey provided written responses naming the traditional owners of the land; 53% attempted to name the local vernacular language. Further, the means for overall self-reports on knowledge of Indigenous place, culture and history were under 5 on a 9 point Likert scale. We view this as evidence of a limited and insufficient knowledge base for a teacher sample drawn from schools that had Indigenous student populations.

As importantly, the self-reported levels of engagement and exchange with Indigenous peoples outside of the school were low, with 45% of respondents reporting no encounters (meals,

informal conversations, social exchanges) with Indigenous peoples or institutions in the previous six month period. Less than 25% had visited an Indigenous institution or organisation, and only 13.5% of all teachers surveyed had visited an Indigenous students' home. *In post-Apology Australia, the actual levels of intercultural exchange with and exposure to Indigenous Australians amongst the predominantly non-Indigenous teaching workforce remain low.* There can be no “cultural interface” (Nakata, 2004) in education if the face-to-face contact between Indigenous and non-Indigenous Australians outside of the institutional zones of schools is negligible.

Our aim here is to contribute to educational understandings about teacher cultural knowledge of and engagement with Indigenous cultural Others. The positive thesis for policy and practice turns on two key findings here. First, despite high levels of dissatisfaction with their pre-service preparation – we found that *any* specialised coursework on Indigenous education and issues, pre- and in-service, tended to lead to higher levels of cultural knowledge, of engagement with cultural knowledge sources, and to higher levels of everyday engagement with Indigenous peoples. Second, where their self-reported face-to-face engagement with Indigenous community was higher – teachers were more likely to be reporting attempts to embed and integrate Indigenous knowledges, culture, history and issues into their classrooms. Interestingly, it appears that everyday face-to-face engagement with Indigenous community appears to be a more significant driver in the reform of curriculum and pedagogy than a general knowledge of Indigenous cultures per se.

Whether and how these efforts make a difference in achieving the national policy goal of “closing the gap” (MCEECDYA, 2010) in Indigenous educational aspirations, achievement and outcomes is, of course, the focus of our current evaluation research and that of others. But what

this initial description of Australian teachers shows is that targeted and specialised teacher training and professional development in Indigenous education can make a difference in encouraging and shaping cultural knowledge and everyday engagement. This, in turn, can set the table for the proliferation of more inclusive approaches to the teaching of Aborigines and Torres Strait Islanders. At the same time, the scale and level of change in teachers' classroom practices appears to depend on everyday engagement with Indigenous communities and peoples. Professional and academic knowledge *per se* – whatever its ideological and cultural orientation – may indeed not be enough.

ACKNOWLEDGEMENTS

The authors are listed in alphabetical order. This research was supported by funding from the Commonwealth Government, Department of Employment, Education and Workplace Relations, Canberra, Australia for the evaluation of the Stronger Smarter Learning Communities project, 2009-2013. The authors would like to thank the teachers who generously participated in the survey. We acknowledge the ideas and support of the research team: Courtney Cazden, Rachel Kim, Valentina Klenowski, James Ladwig, John Lester, Leanne MacDonald, Shelley MacDonald, Jean Phillips, Nerida Spina and Annette Woods. We also thank members of the SSLC staff and Indigenous Education Reference Group who offered critical comments, feedback and input on the survey instrument at key junctures in its development: Will Davis, Ray Land, Max Lenoy, Karen Martin, Irabinna Rigney, Grace Sarra, Iqbal Singh and Stacey-Ann Wilson.

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