

**UNIVERSITY OF NEW ENGLAND**

**VIRTUAL PROVISION FOR GIFTED  
SECONDARY SCHOOL STUDENTS:  
KEEPING THE BEST AND BRIGHTEST  
IN THE BUSH**

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## **Abstract**

This evaluative research, using a mixed methods case study approach with triangulated design, investigated the perceived value of a virtual academically selective secondary school provision for Years 7–10 (age 12–16 years) that operated in Western NSW Region from 2010 until 2014. Students replaced regular curriculum study in the areas of English, mathematics and science at their local state-government-funded bricks-and-mortar school, with study that was conducted online with a cohort of academically gifted students from across similar schools in Western NSW Region.

Perceived value by students and staff in the virtual provision as well as perceived value by parents and local state-government-funded secondary school Principals was positive, with students reporting a strong sense of belonging to the gifted cohort as well as their local school cohort, an improved skill-set to meet 21st-century learning requirements and the capacity to harness their full potential through development of enabling skills such as organisation and study skills. Academic achievement of the virtual provision cohort in national or state-wide standardised tests matched those of metropolitan selective secondary school counterparts in literacy, numeracy and science understanding.

All stakeholders agreed that the virtual provision did not suit all gifted learners, only those who were autonomous learners or were motivated to learn in a lightly supervised environment and who held a positive academic self-concept and as such were comfortable not being first in their class all the time. Some students found the challenge of many academically-able peers overwhelming as they had been the outstanding pupil all their school life.

Unexpected benefits reported by parents of the students in the cohort included their choice to stay in employment in the regional, rural or remote areas, or to delay or abandon their plans to send their child to a metropolitan boarding school as their gifted child's learning needs were being met by the virtual provision. This decision added to the social fabric of the rural communities and their local school. Teachers in the virtual provision reported being re-invigorated in their career by having a virtual staffroom of like-minded peers who embraced challenge, were curriculum specialists in their area and endorsed technology-enhanced learning.

This research contributes to the growing field of knowledge about the suitability of virtual school provisions for gifted secondary school students in rural, regional and remote settings. Keeping the best and brightest students and teachers in the , along with their families, is essential to ensuring dynamic and vibrant rural, regional and remote communities.

## Declaration of Originality

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Signed: \_\_\_\_\_



On: 13 / 2 / 2019

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The journey undertaken during a thesis is not taken alone. I have been lucky enough to be supported and encouraged by my immediate family as well as my extended family throughout my journey. I need to thank my three children for their continued understanding when I was buried in this work, and my extended family who have undertaken proof reading or transcription in a successful attempt to keep me on track. To my sister, thank you for the professional conversations throughout my teaching career as well as along this journey.

I am indebted to the students, staff, parents and school Principals who agreed to be part of this study and trust that they will be as proud as I am of the small contribution this study will make to new knowledge in the field of gifted education.

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My parents, both teachers, passed before I began this journey. They would have been inordinately proud. Dad may even have given me one of his special one dollar prizes, reserved for only the best achievements.

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## List of Abbreviations

ACER	Australian Council for Educational Research
BOSTES*	Board of Studies, Teaching and Educational Standards for NSW
COAG	Council of Australian Governments
ESSA	Essential Secondary Science Assessment
FTE	Full Time Equivalent
ICT	Information and Communications Technology
KLA	Key Learning Area
LVC	Live Virtual Classroom
NAPLAN	National Assessment Program for Literacy and Numeracy
NESA*	NSW Education Standards Authority
NSW	New South Wales
NSW DoE**	New South Wales Department of Education
NSW DEC**	New South Wales Department of Education and Communities
NSW DET**	New South Wales Department of Education and Training
WNSWR	Western New South Wales Region
VSSSP	Virtual Selective Secondary School Provision

\*BOSTES was renamed on 1 January 2017 to NESA

\*\*All three names are for the same state government department that was renamed throughout successive government terms.

# **Chapter 1: Introduction and Background**

## **1.1 Background to the Research**

This chapter will explain why the research project was undertaken and provide a little bit of background about myself as the researcher and the school used as the case study in the project. The research has taken some time to come to fruition. In 2010, I was a senior education officer with the New South Wales Department of Education and Communities (NSW DEC) performing an executive role at the Virtual Selective Secondary School Provision (VSSSP) in charge of teaching, learning and technology. This virtual education provision provided an opportunity for gifted and talented secondary school students in “the bush”, that is, rural, regional and remote parts of New South Wales (NSW) to access an appropriately paced curriculum in the areas of English, mathematics and science. While in the executive role at the VSSSP, I completed a master’s degree in education. This study whetted my appetite, and I developed a growing awareness of just how innovative the VSSSP was. A successful application for a NSW Premier’s Scholarship for Excellence in Teaching in 2011 resulted in travel to USA, Ireland, Jordan and Hong Kong in 2012 as part of the scholarship. On this journey I visited schools and institutions to investigate both virtual provisions and gifted education provisions. Over the five weeks of scholarship visits overseas, I was further convinced of the true innovative nature of the VSSSP. I returned from my investigation of virtual secondary school provisions and gifted education strategies, firmly convinced of the need to formally investigate and record what was taking place in the rural, regional and remote parts of western NSW in the VSSSP.

To establish further the motive for this research to be undertaken, I will explain a little about my background and the source of my interest in the field of

gifted education. I began teaching in the 1980s and am a member of an extended family of teachers. This extended family includes six teachers of science and five early childhood teachers, one of whom is a behaviour specialist. I grew up in a regional town that has a university, listening to what I now recognise were professional conversations but which, at the time, I considered normal family chat. Most family friends were involved with the university in some capacity, primarily as lecturers and researchers, some as support staff in a variety of offices, or if not with the university they were with one of the many schools in this regional town. To say that I grew up surrounded by, and immersed in, education would not be an understatement.

My interest in gifted education began when one of my own children had a less than ideal start to school. The child, who will be referred to as Louise, entered kindergarten at age five already able to correctly complete three-digit addition and subtraction (e.g.,  $451+327$ ). I had no concept that this was exceptional.

Two weeks from the end of her first year at school, my daughter refused to go to school and was extremely upset. She said, “I can’t do it any more” over and over again. After hearing some soothing words from me, she calmed down enough to be able to say, “I just can’t teach them any more”. Investigation led to the discovery that, since she could already do all the mathematics planned for kindergarten and very quickly mastered all other skills, she had been assigned by her classroom teacher to tutor a small group of students with learning difficulties. At the age of five years, Louise had been a teacher for a year. To their credit, when I discussed this with the school, immediate action was taken. In an interview with the school executive, the term acceleration was mentioned—a word I had not heard before in an educational context apart from during physics lessons. This inauspicious meeting

with the senior executive at the school began my decades-long journey into gifted education and advocacy for gifted children. I undertook postgraduate studies in gifted education and became very active in both professional and private circles to advance the educational cause for gifted students in mixed-ability classrooms through the provision of education for parents/carers and teachers.

In 2009, I successfully applied for an executive position in the yet-to-be-opened VSSSP in what was then known as NSW Department of Education and Communities (DEC) Western New South Wales Region (WNSWR). I had been employed as the regional coordinator of gifted and talented student programs across more than 40 government schools in WNSWR, so the VSSSP was naturally of interest. The new position required me to work with a team to take the vision of the senior educational managers in WNSWR and turn it into a reality. There were ideas and some caveats in place, but the details of implementation had yet to be determined. A team of two other people and myself, employed for the VSSSP, worked for one-and-a-half school terms (15 weeks), to bring the program to fruition. We coordinated, liaised and planned with a vast range of other skilled people including school principals, academics and educational consultants, in addition to senior educational managers in WNSWR. The virtual doors opened to a single cohort of 30 high-ability Year 7 students in 2010 and increased by 30 Year 7 students per year in each of 2011, 2012, 2013 and 2014.

The VSSSP planning team grew to include a number of classroom teachers in Term 4 2009, and this expanded team developed some of the most creative pedagogy it has been my honour to witness. While I might gain recognition for my part in the process as one of the school leaders, at no time can the contribution of all staff be



discounted. Without staff members' collective effort, imagination and creativity, there would have been no VSSSP to lead.

In this research project, I was an insider researcher (Smales, 2002). There was a need to ensure my leadership as a researcher was separated from my incumbent executive position (Washbush, 1998) within the virtual secondary school provision in this case study. It was critical that my position did not form a barrier to uncovering truthful opinions of the participants who agreed to take part in this research. To mitigate any possible Hawthorne effect (Neuman, 2011), which may have seen participants respond with answers they thought I was trying to elicit in this research, I took leave for the duration of the active research and data-analysis phases. This leave was designed to remove me from my position as a member of the senior executive team at the VSSSP. As it transpired, I successfully applied for a senior executive position at another school in a metropolitan area during the research leave period, which allowed further distance from positional incumbency at the VSSSP and reduced any possible Hawthorne effect. In addition, all email communication for the research project was conducted from the email address of the supervising tertiary institution, with no email contact occurring via the normal education institution email address I used in my executive role. As well, a separate, personal mobile phone number was supplied to research participants if they wished to get in touch with me about the research. These deliberate actions further signified that the research project was separate from my day-to-day work.

The VSSSP as described in this research no longer operates in the form it did when this research was undertaken. The small pilot provision of 120 students in Years 7–10, used as the subject of this case study, has been expanded across the whole state of NSW and now operates as a gazetted government school in its own

right. This case study does not refer to the current expanded secondary school and as such refers to the VSSSP in the past tense as it no longer exists as it did from 2010 to 2014. Students who began with the VSSSP in 2010 had to leave when they enrolled in Year 11, so the highest concurrent enrolment at any time was 120 students in 2014.

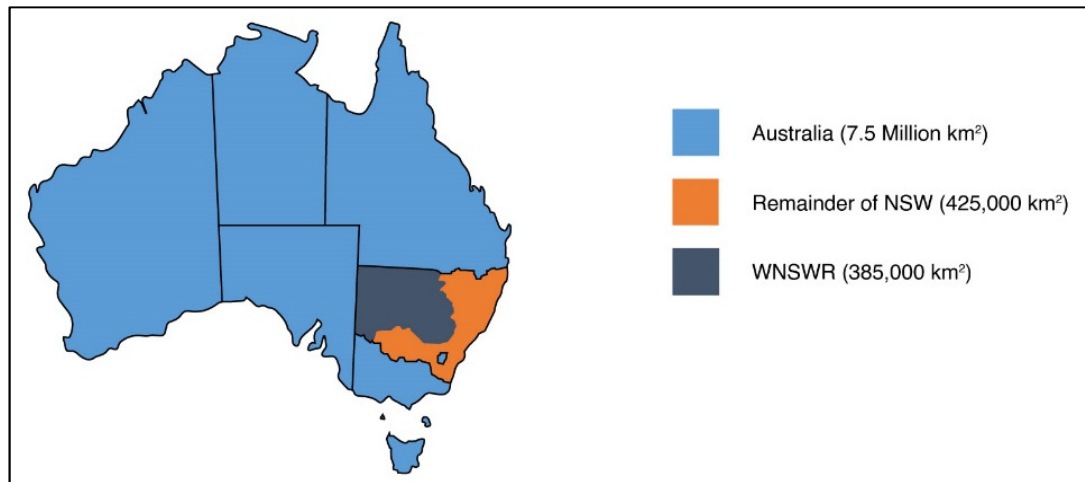
This section has described the original motivation to undertake research and the background of the researcher. Some context for readers has been provided in order to understand that the VSSSP was a unique provision catering for the needs of gifted students in rural, regional and remote areas, for the time it was in operation. The provision described in this research no longer exists as it did, but has been expanded into a gazetted school covering all non-metropolitan areas of New South Wales. Motivation for the research has been established with a personal and professional interest in the education of gifted students declared. It could also be useful to understand if lessons learned from this study might be applied to the current iteration of the virtual school or other virtual schools located in rural, regional and remote areas that cater for the educational needs of gifted students.

In the next part of this chapter the nature of the VSSSP will be explained. Like in all schools, there were students and teachers meeting and delivering syllabus outcomes, but the day-to-day operation and entry process to the school were unique.

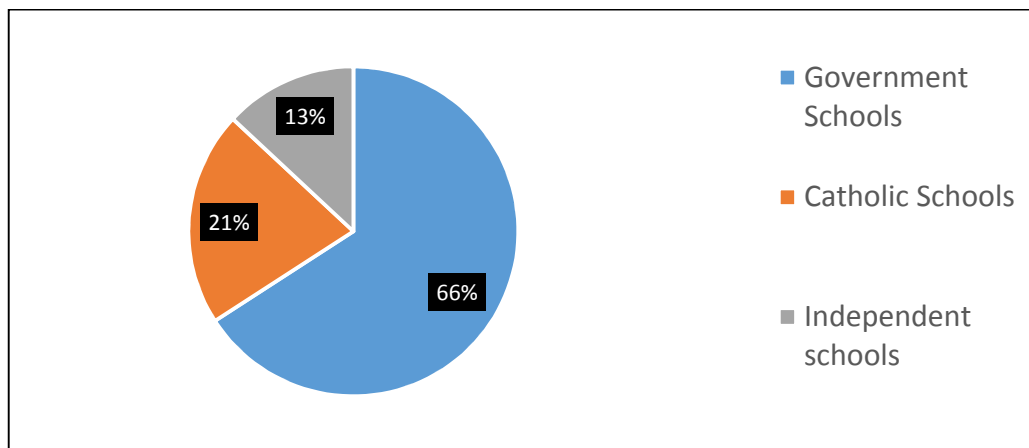
## **1.2 The Case Study Virtual Selective Secondary School Provision (VSSSP)**

In this section the context of the case study provision and a description of the day-to-day operation will be expanded. The geographical location and reasons for existence of the virtual provision will be explained.

Australia is a large country, and NSW is a large state. Figure 1.1 shows the geographical context of the area in this research. According to Halsey (2018, p. 25) there are approximately 9 000 schools in Australia catering for 3 786 000 students; 4 400 (or 47%) of these 9 000 schools are located in non-metropolitan areas. Of these 4 400 non-metropolitan schools, 1 700 have an enrolment of fewer than 100 students with the total number of students in non-metropolitan schools across Australia recorded in 2016 as 1 108 000 (Halsey, 2018, p. 25). The VSSSP in this research covered all 45 government secondary schools in WNSWR and as Figure 1.1 shows, this region is nearly one half of the whole state of NSW. Under the Australian Constitution, education is the responsibility of the states. Most schools in NSW (65.6%) are administered by the NSW Government through the NSW DEC, as shown in Figure 1.2 (Australian Bureau of Statistics, 2014). The administration of public schools in NSW was devolved until 2013 into 10 regions, with WNSWR covering a large area of some 385 000 square kilometres. To assist with context, this is equivalent to the size of Germany or the USA state of Montana. WNSWR contained total secondary school enrolments of just under 17 000 students attending 45 central and secondary schools (NSW DEC, 2012). Central schools combine Kindergarten to Year 6 and secondary schools on the one site, with one principal, and are found in many small regional and rural towns.



*Figure 1.1* Geographical context of the educational region previously known as WNSWR. Source: Bannister (2012).



*Figure 1.2* School sector administration in NSW 2013. Source: Australian Bureau of Statistics (2014).

In NSW, state government administered, academically selective secondary schools, commonly referred to as selective schools, cater for gifted and talented students who have superior to very superior academic ability, evidenced by exceptionally high classroom performance. Selective schools can provide intellectual stimulation by grouping together gifted and talented students who may otherwise be isolated from a suitable peer group simply due to low population numbers (NSW DoE, 2018, 27 Dec). Until 2010, there had not been a selective school available to WNSWR secondary school students unless they were prepared to leave home to

attend a school in a metropolitan area or one of the two agricultural secondary schools in large regional centres that also offer a selective stream. Historically, many eligible and potentially interested students were not able or did not wish to move away from home (NSW DEC, 2009).

A phenomenon observed for decades had been a significant brain drain from rural and regional areas (St George, 2011) owing in part to educational opportunities available in metropolitan areas that had not been available to students in less urbanised areas. Brett (2011) states that the country and the city can be seen as both cultural and geographic locations with an emphasis on the lack of quality healthcare, education, broadband internet, transport and infrastructure in rural, regional and remote areas of Australia. Smaller populations outside of metropolitan areas can mean a smaller population of gifted students in one area and this lack of a large cohort of similar-ability students had seen many parents send their children to a private boarding school (independent schools where students live on campus during the school term). The practice of sending children to boarding school, for those families who could afford this option (current fees for boarding and tuition average AU\$30,000 per year per child), had an impact on the family unit as well as on the capacity of local schools and their attractiveness for prospective staff (Brett, 2011). Some children in western NSW live on farming properties that are two to three hours by road from the closest town, and others are part of very small cohorts in their local public secondary school. Larger regional centres may have comprehensive secondary schools with up to 200 students in each year cohort, but smaller numbers are more typical. In all these situations, the likelihood of gathering a cohort of 30 gifted students is small because of the low population (Wood & Zundans-Fraser, 2013). The number 30 is significant because it represents one full class. Current industrial

relations guidelines set the maximum class size in government schools for Years 7–10 in English, mathematics and science at 30 students.

The “tyranny of distance” (Blainey, 1966; Edwards & Baxter, 2013) endured by many rural and regional families has been linked with negative educational outcomes for rural students, including lower academic outcomes related to the social stratification that is revealing itself across Australian education sectors (Perry & Lubienski, 2014). In Australia it matters where a student goes to school; Organisation for Economic Co-operation and Development (OECD) data demonstrate that the difference in achievement outcomes for a student from a high socio-economic family attending a high socio-economic school may be as much as three years gain in favour of the more economically advantaged student (Perry & Lubienski, 2014; Halsey, 2018). The notion of disadvantage increasing with decreasing socio-economic status is also supported by Gonski (as cited in Riddle, 2014). The Gonski report of 2011 commissioned by the Australian Government found that the level of student disadvantage increased with the level of Indigeneity, school remoteness, disability and English language proficiency (Riddle, 2014; Halsey, 2018). Data collected from a range of countries also support the negative impact of low socio-economic status on the achievement levels of students as stated in the 2012 report from the Program for International Student Assessment (PISA). Data in that report suggest that there is a gap of two and a half years in achievement levels between students from high socio-economic backgrounds and those from lower socio-economic backgrounds, with the more economically advantaged students ahead of the less advantaged students (Thomson, De Bortoli, & Buckley, 2013; Halsey, 2018). This collection of evidence provides a picture for the necessity of

senior WNSW management to address the inequity of access to an appropriate curriculum for gifted students living in rural, remote and regional areas.

The situation for students and staff in rural, regional and remote areas has not changed as evidenced by the independent review into rural, regional and remote education by Halsey (2018). In this report, Halsey (2018) refers to the same size educational achievement gap that existed in 2013 (p. 11).

The provision of an equitable and high-quality secondary selective curriculum had been a goal of senior educational managers in the WNSWR for some time, and matched that of the Australian Government Human Rights and Equal Opportunity Commission (HREOC) who stated that opportunities for rural students must eliminate negative forms of discrimination based on geographic location. The HREOC report asserts that education for rural and remote students must be available, accessible, affordable, acceptable and adaptable (Australian Government, 2008). There was a nationally agreed framework to support the education of students in rural and remote areas which aimed to meet the needs of rural families through local commitment and ownership, in predictable ways, through government funded initiatives (Australian Government, 2008). The Halsey (2018) report reveals that a decade on, these same problems for education in rural, regional and remote locations continue to exist with reduced accessibility and affordability of ICT in regional areas and reduced choice of education options still forming barriers to equity of education opportunities (p. 12).

The nature of WNSW region, its needs and expanse, coupled with other unrelated educational innovations occurring concurrently and as are described in the next paragraph, allowed the NSW DEC to capitalise on the strengths and interests of contemporary young Australians by providing a virtual selective secondary school

with a limited curriculum of English, mathematics and science (NSW DEC, 2009). The inherent inequities for students in rural communities in accessing a selective secondary school where a group of similar-ability students may be found, could be addressed using technology to deliver the curriculum and to develop collaborative learning communities.

The Council of Australian Governments (COAG) planned to implement a suite of reforms to fundamentally transform the way schooling took place and was prepared to fund these transformations (COAG, 2008; Ministerial Council on Education, Employment, Training and Youth Affairs, 2008). Senior managers of WNSWR proposed, then developed and implemented, a pilot virtual selective secondary school to take advantage of the intersection of regional, state and national educational agendas (NSW DEC, 2009). Such agendas included the equipment and infrastructure made available through Federal and NSW Government initiatives. These initiatives included the Digital Education Revolution (NSW DEC, 2010a), the Connected Classrooms Program (NSW DEC, 2010b) and the Network Enhancement Project (NSW DEC, 2010b). The virtual secondary school provision also used software made available through NSW DEC enterprise agreements with software providers. Any student enrolled in a government school in NSW was entitled to a significant suite of software valued at over AU\$5000, for free, for use on one device at home and their school-issued device received when they were in Year 9. This included the full suites of Microsoft Office® and Adobe Creative®.

The need for teachers and schools to provide gifted and talented students with an individually appropriate, flexible learning pathway is clearly outlined in public policy at both the national level (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2013) and in state policies. In NSW, the DEC had for many



years required all school communities to identify and support the academic, social and emotional needs of their gifted and talented students and had for some decades provided selective secondary schools that group together students of high academic ability. There are currently 47 selective secondary schools in NSW (NSW DoE, December 2018), 17 of which are fully selective while 24 are partially selective, having both selective and comprehensive (mixed academic ability) classes on the one site. There is one virtual selective secondary school which is fully selective and four agricultural high schools which are fully selective.

The number of student places available in selective secondary schools is limited by a quota set by the NSW Government, and entrance into Year 7 is via the state-wide Selective Secondary School Placement Test taken when the student is in Year 6 (the last year of primary school). The Australian Council for Educational Research (ACER) creates and administers this test, which measures ability in reading, writing, mathematics and logic and is set to discriminate at a very high level. The design of this test makes it very rare for even the most able candidates to score full marks. Applicants may request special test provisions because of a disability, a medical condition or a behaviour disorder (NSW DoE, December 2018).

In a typical year, students who gain entry to any selective secondary school will be in the top 5–10% of the state-wide same-age cohort for academic ability. In some years, it may be that students are in the top 1–5% of the cohort. The tests assume a high standard of written English. More than 14 501 applicants contested 4 256 student places in 2018 (NSW DoE, 2017).

In 2008, the NSW state government chose to increase the quota of student places in selective secondary schools. An extra 600 student places were allocated and they were to be distributed evenly across all 10 educational administrative areas

within NSW. All but one of the previously mentioned 10 school administrative regions in NSW assigned their new selective secondary school student placements to an existing secondary school, making them partially selective secondary schools (NSW DoE, December 2018). However, WNSWR chose to form a new virtual selective secondary school provision for its student placements, a decision based partly on the large geographic area of the WNSWR. If the placements had been allocated to any existing secondary school within the region's four larger population centres (Bathurst, Orange, Dubbo or Broken Hill), more students collectively would have been disadvantaged than advantaged through a lack of access to these cities.

The decision to move to a virtual provision may have been influenced by other virtual programs that had been in existence for some time in the region. The principals and senior managers of the region had supported the formation of virtual faculties (Manwaring, 2013) that supported newly graduated teachers who were placed in small, remote schools where there were few other staff. Through these virtual faculties the recent graduates could receive subject-specific support from a faculty leader at one of the larger high schools in the area (Manwaring, 2013). As well, an extension program designed to support gifted students from Year 5 to Year 8 had been in place since the mid-2000s. This program known as RVOC (Regional Virtual Opportunity Class) and later known as i.xtend (Dixon, 2009; Wood & Zudans-Fraser, 2013) met the educational needs of some gifted students and was based on the Renzulli Enrichment Triad method (Renzulli, 1977). A third existing virtual education program called Western Access Program (NSW DoE, Online) saw small regional and remote schools band together to deliver Higher School Certificate subjects for their students when there were not enough students at any one location to justify employing a teacher in every Key Learning Area. When combined across a

number of these small schools, cohorts became large enough to form a small class with a teacher based at one of the schools teaching into all the schools, using video conference technology. As these three other provisions demonstrate, operating in a virtual or distance model was not new to the region, the staff, the students or the parents.

### **1.3 Students in the VSSSP**

In this section material previously written for another paper presented at the 30<sup>th</sup> national conference of the Society for Provision of Education in Rural Australia will be referenced. The description of the daily operational detail of the VSSSP can only be expressed in a small variety of ways, none of which can be completely different from each other. The assistance of co-authors in that paper (Bannister, Bannister-Tyrrell, Cornish & Gregory, 2015) in Sections 1.3, 1.4 and 1.5 of this thesis is acknowledged.

The VSSSP catered for gifted secondary school students in rural and remote western NSW. As mentioned previously, a student who wished to apply to enter any NSW selective secondary school, including the virtual selective provision, must self-nominate and complete a unique state-wide test known as the Selective Schools test, which is created and administered by the Australian Council for Educational Research. Students must register their interest to sit the test when they are in Year 5 (October) then sit the test early in Year 6 (March) to gain entry into Year 7 the following calendar year (late January). Students are advised of their success, or not, in October when they are in Year 6. Parents and primary school principals must be aware of this process and the lead time required. Once selected for the VSSSP through the selective schools test, when students commenced in Year 7 they still attended their local public secondary school for some of their classes, while meeting

over the Internet for classes in English, mathematics and science, using advanced technologies and pedagogies for online learning.

A unique feature of the VSSSP was that students could elect to permanently leave the selective stream and return to their mainstream classes at the local school at any time. Unlike all other fully selective high schools, which are stand-alone schools on a particular site, the VSSSP existed only in the online space. This unique feature meant that staff at the VSSSP had to work consistently to build and maintain a sense of belonging for students at the VSSSP.

Some students were the only student at their school to be selected for the VSSSP. This meant the student could spend up to 40% of their lesson time alone in a quiet space at the physical school interacting with their peers in the VSSSP through web-conferencing software. Some students found this feeling of isolation very difficult and they chose to leave the VSSSP to return to their local school classroom. If there were students from a number of different Year groups, or grade cohorts at the same local school and in the VSSSP, this sense of isolation was diminished. Some students thrived in this isolated environment (as reported by parent–teacher conversations) and reportedly looked forward to a quiet, calm space to immerse themselves in their learning.

In some larger schools a large number of students were successful in gaining a place at the VSSSP. If the students all had a virtual lesson at the same time, the quiet space for lessons could quickly become a noisy environment. Supervision in the room where students met for the VSSSP was the responsibility of the local school and schools approached this in myriad ways. Mostly, supervision was by line of sight, often by the librarian as the VSSSP room was quite often a small seminar room in the library. Some schools chose to allocate a staff member to supervision of the

VSSSP room on a full-time or rotational basis and others chose to roster supervision of the room on an ad hoc basis. The absence of classmates in the physical space for the VSSSP lessons at the local school and the supervision of students if there were more than a few was a complex matter. At times, some students chose to leave the VSSSP not because they were lonely, but because of the perceived lack of supervision in the room by their parents and some reports of off-task behaviour by some students, their parents or the school-appointed supervisor. Off-task behaviour included chatting with each other instead of completing set work, noisy talking across the room, using the Internet to research unrelated materials or in some cases physical games in the room. In all local schools, considerable trust was placed in the students to behave well and remain on task.

By supporting academically able students in their local community and meeting their educational needs using online technologies, the VSSSP nurtured talent and grew the potential of the student and the community (NSW DEC, 2009). In this way, the vision of the provision, to bring the selective secondary school curriculum to students in their local public secondary school in rural, regional and remote parts of NSW, became a reality.

## **1.4 Curriculum and Lesson Delivery at the VSSSP**

Not all compulsory areas of study in NSW schools transfer easily to a digital-delivery method. Thus, the decision was made to limit the curriculum for the VSSSP to English, mathematics and science. When the local public high school cohort was timetabled for English, mathematics or science lessons, the VSSSP students moved to a quiet space in the school to attend online lessons or complete work from the digital learning repository. At no time did the VSSSP students attend English, mathematics or science classes at their local secondary school with the exception of

working with a local teacher to complete mandatory practical classes for science as stipulated in the NSW syllabus. VSSSP students attended their other lessons, such as Music, Art, Physical & Health Education, Languages other than English, Design & Technology, History and Geography with their local public school cohort.

The relevant NSW syllabus mandated by the NSW Education Standards Authority (NESA) was used as the basis of instruction; however, extensive use of pre-testing and curriculum compacting allowed for time to be spent on extension and enrichment material. Curriculum compacting involves finding out how much of the intended content of the course has already been mastered by the student, then removing any of that already mastered content material from future lessons (Renzulli, Smith & Reis, 1982). In this way, only new material is covered. In addition, teachers used open and flexible e-learning strategies that encouraged collaboration and problem solving through a wide variety of technologies such as a choice of open-ended tasks available on the Learning Management System. Moodle™ (Modular Object-Oriented Dynamic Learning Environment) was the platform chosen to host learning materials as it was already widely used across schools in western NSW region. The platform affords anytime, anywhere access for students and can be customised by teachers. Students were continuously scaffolded in their learning to support their individual learning needs. Programs reflected best practice in gifted pedagogy available at the time and included rigorous, appropriately supported educational challenges (Chandra Handa, 2009), regular opportunities to work independently and with other like-minded peers (Rogers, 2007), subject acceleration (VanTassel-Baska, 2005) and differentiated curriculum in terms of content, process and product (Maker, 1982). The ratio of teachers to students in the VSSSP was 1:10.

The VSSSP used a blended learning approach (Horn & Staker, 2014).

Blended learning is defined as learning that occurs at least in part through online learning, with some element of student control over time, place, path, and/or pace. It is also at least in part in a supervised brick-and-mortar location away from home with the modalities along each student's learning path connected to provide an integrated learning experience (Horn & Staker, 2014). This model enabled high-ability students to stay enrolled in their local public school, allowing small regional and rural communities to retain their best and brightest students, while providing an opportunity for educational stimulation to meet these students' special needs. In the past, if gifted students left their local communities to attend boarding or residential schools in large metropolitan areas, their local school communities may have been somewhat depleted. By completing three of their subjects (English, mathematics and science) in an online environment in the VSSSP and the remainder of their classes with their local cohort in their bricks-and-mortar local school, VSSSP students were immersed in a blended learning environment with their face-to-face classes at the local school and their online classes at the virtual school.

Online learning using web-conferencing software ensured regular contact between physically separated teachers and students, as they saw each other several times each week in synchronous virtual lessons. A residential school was held over two days and two nights once every school term (four per year). All staff and students attended this residential school which was held in a central location in WNSWR. The residential school was necessary to conduct the practical aspects of subjects (such as dramatic performances and science experiments) and helped to build a sense of belonging by allowing students and staff to spend time getting to know each other. The VSSSP used web-conferencing software to deliver

synchronous lessons in real time and a learning management system stored all learning materials in a digital learning repository for later asynchronous learning. The NSW DEC spent significant time, effort and funds to set up this different type of selective secondary school provision.

## **1.5 Staff at the VSSSP**

A unique staffing model had been developed to allow teachers to work with the students in the VSSSP while remaining in their own local government-owned secondary school. As such, these teachers were valued members of two schools (NSW DEC, 2009). VSSSP teachers were seconded for 40% of their full-time duties to teach in the VSSSP. They designed, delivered and assessed all learning materials. At no time did staff in the VSSSP teach students in the VSSSP who were at the same physical location as them. This requirement was in order to ensure there was no inadvertent preferential treatment or extra attention provided to a student in the same physical location as a staff member. As all students were equal in being remote from the teacher, there could be a similar amount of attention given to all students and all students were required to access the teacher via email.

Prospective staff had to be current employees in a WNSWR DEC school and be curriculum experts as well as excellent communicators with a good command of technology in education. Above all, staff had to be supportive of the concept of gifted education (Geake & Gross, 2008) and be flexible and adaptable. As part of their induction to the school, teachers received training in gifted education strategies, the use of web-conferencing software, and the use and organisation of the digital learning management system that included instructional design for web-based learning materials. Excellent organisation of learning materials was considered by staff and students to be critical to the success of teaching and learning in this



environment and was later supported by research conducted by Thomson (2010) that was published after the first year of operation of the VSSSP in Australia. This excellent organisation of learning materials included features such as logical and quick access to materials so that students did not have to perform a large number of mouse clicks to reach their desired online material.

Senior executive in the virtual school monitored and supported staff either through personal visits to the local school or through the use of technology. Classroom visits, as traditionally practised by on-site executive, were conducted virtually by the senior officer joining lessons via web conference.

Staff placed their lesson material and learning resources onto a digital learning management system (LMS). In a separate, staff-only section of the LMS, planning and brainstorming for future lessons was conducted. In addition to the staff sections of the LMS, staff had a wiki (Wikispaces, 2015) where minutes of meetings, important notices and important forward planning documents were stored. Whilst wikis are no longer available, the wiki in place at the time of the VSSSP allowed staff to have professional conversations with no chance of students ever accidentally seeing the material. This security was necessary as there had been instances where staff new to such heavy technology use had inadvertently uploaded documentation to an area of the LMS that could be seen by students. A completely separate digital space, the wiki, ensured digital safety of documents that were not intended to be shared with students.

Two full-time executive staff managed all students and staff at the VSSSP. They were supported by an Administration Officer who was also full-time. To ensure there was no perception of favouritism towards any one partner school of the over 30

partner schools, these three staff operated out of an office that was situated in a building with other senior regional managers, rather than in any of the school sites.

## **1.6 Lessons at the VSSSP**

One phenomenon noticed on the tour of virtual secondary school provisions undertaken in 2012, was that all provisions had what is commonly referred to as a footprint lesson schedule. A footprint model is when the lesson schedule—or timetable, as it is commonly known in Australian schools—for the online lesson is instigated over the top of the existing lesson schedule for students, much as a footprint stamps over the top of whatever else is already on the ground. For example, the student may have an art lesson from 9.45 am until 10.30 am on Tuesdays, but the virtual lesson in mathematics will be scheduled, without consultation, from 9.30 am until 10.30 am on the same day. In this instance the student must choose whether to attend the art or mathematics class on Tuesday mornings.

However, at the VSSSP, the lesson model was a zero footprint model; that is, it had to leave no trace on the existing lesson schedule of the student. Students were never forced into making a choice about which lesson to attend, as alternative subjects were not scheduled at the same time. To achieve this goal, specialist software was written to take into account the differing lesson lengths, time zones and subject areas that were occurring simultaneously across WNSWR schools. Students and staff were distributed across 31 different school sites covering two time zones. Lesson lengths at the participating schools varied from 40 to 75 minutes per lesson. Lesson schedules in participating schools varied from a Monday to Friday one-week repetition to a two-week repetition cycle. In a two-week repetition cycle, the first week is known as A Week, the second as B Week. Participating schools did not always have the same A and B weeks in their repetition cycle. Some schools started

every new school term on an A Week, others started the A/B cycle at the beginning of the year and kept going, with the result that a new term throughout the year might start on either an A or B Week depending on the number of weeks in the previous school term. School terms differ in lengths due to the extreme heat in the far west of NSW. At the beginning of the year, schools start seven days after schools in the eastern part of western NSW.

To give maximum flexibility to virtual lesson scheduling, each student was asked to submit their local secondary school lesson schedule to VSSSP executives with a series of open spaces where they would have been doing either mathematics, English or science. Other areas of study were left in the lesson schedule, as were times for rest breaks and local school assemblies. This schedule of available blank timeslots indicated a series of possible times for synchronous virtual lessons without affecting the other areas of study being completed by the student. The specialist software produced a suggested lesson schedule that matched 10 students from the same year group with one teacher for synchronous lessons. This suggestion was then refined by the senior executive of the VSSSP.

Staff were asked to present their local secondary school lesson schedule in the same manner. If they had been employed, say, as a science teacher in the VSSSP and taught other science classes at their own local secondary school, there would only be a limited number of times when a virtual lesson would be possible without it interrupting lessons with other local classes. In a similar way that students were never asked to choose between classes, teachers at the VSSSP were never scheduled to attend more than one class at any particular lesson time.

In addition to these synchronous online lessons, students and staff had access to a digital learning management system (LMS) where resource materials for student

learning, assessment tasks and daily activities to be completed, as well as completed student work ready for checking by the teacher, could be uploaded. Each student had a dedicated area in the LMS, which was visible only to teachers, where they could upload their work. Sometimes students chose to upload drafts of work if they required feedback on progress or guidance, at other times they uploaded finished work when a task was due. Students were also asked to contribute to public spaces or discussion forums as part of their learning process. These teacher-guided discussion forums formed an integral part of the learning process.

A separate part of the LMS was reserved for student–student interaction that had nothing to do with school work. This discussion forum was used in a manner similar to the outside play areas of a school where, during rest breaks such as morning tea and lunchtime, students could chat about what they did on the weekend, their favourite music, sporting teams, books to read and any other socially acceptable matters. These digital conversations were lightly monitored by senior executive at the VSSSP with the guideline that conversations had to meet the published school values, including avoiding racist, sexist or bigoted speech and maintaining a supportive manner of interaction. Students were given access to this forum as soon as their place at the VSSSP had been confirmed in October the year before they began at the VSSSP in the following January. In each new cohort of 30 students, several thousand short written exchanges were common before they ever met face-to-face. The forum was a deliberate attempt by the senior executive at the VSSSP to generate a sense of belonging and community amongst the students and to engage both parents and students in the technology.

## 1.7 Parents at the VSSSP

Unlike a regular bricks-and-mortar school, particularly in rural and regional towns where parents often liaise with teachers in person on an informal basis at the school bus stop or at children's sport on the weekends, parent-teacher contact was limited primarily to planned email or phone conversations. At times parents found this arrangement disconcerting as they were limited in the number of times they could approach their child's teacher on an informal basis.

Due to the highly distributed nature of the VSSSP there was no real opportunity for a parent group to meet, such as a Parents & Citizens Committee that exists in most government schools. Coupled with the lack of informal communication opportunities, some parents expressed to senior VSSSP management that they felt a little left out.

To help address this issue a regular newsletter was published and emailed home. The newsletter contained samples of student work, a report from at least one Key Learning Area, celebration of extra-curricular achievements of students and notice of upcoming events at the VSSSP. Executive staff also provided a link, or if copyright allowed, a copy, of current research in gifted education. Many parents expressed their pleasure at the research links in particular.

The student work published in the newsletter was not always the most successful that had been submitted. In an effort to address perfectionism in gifted students (Silverman, 2007), work that showed a superior, albeit inaccurate, creative or critical thinking style was published. In this way students could see their work published for a number of reasons, not just for being the best.

Teacher-Parent interviews regarding student progress were held twice per year using the same technology that students used to participate in lessons on a daily

basis, that is, in the online classroom. Parents were given a chance to understand a little better the technology used, including the strengths, weaknesses and challenges faced by their child. The combination of phone call, email, virtual conference and newsletter was aimed to alleviate the feeling of exclusion expressed by some parents.

## **1.8 Aims of the Research**

This research seeks to fill a gap as identified in the literature review presented in the next chapter. The gap that existed at the beginning of this research journey in 2013 is in current knowledge of virtual educational provisions for gifted secondary school students in rural, regional and remote areas. This research is a case study of the first virtual selective secondary school in Australia catering for the needs of gifted and talented students in rural, regional and remote areas of NSW. The research aims to investigate whether the virtual secondary school provision has been of value, as perceived by the stakeholder groups of students, parents and teachers at the virtual secondary school provision. If the provision is considered to have been of value by the stakeholders, the ways and means of that value will be explored.

Crucially, the research aims to understand why the virtual provision appeared to suit some students and not others. As time went by, anecdotal evidence suggested that some students thrived in the virtual learning environment and others did not. As previously described in this chapter, continued enrolment in the Virtual Selective Secondary School Provision (VSSSP) was entirely optional, as students could withdraw at any time and return to their mainstream classes at their local school. Some students chose this option and upon exit interview with VSSSP executives, a pattern seemed to emerge. It appeared that regardless of their academic ability or the number of students at their local school enrolled in the VSSSP, the learning

environment was suited to only some students. This unsuitability was supported by anecdotal comments from parents.

The aims are ambitious and the journey through this thesis will take the reader through two time zones and across a land area of some 385 000 square kilometres. Throughout these time zones and large geographic area there exists a range of secondary schools. Whilst some schools are large secondary schools with over 800 students on a single site, others are tiny secondary schools combined with primary schools, the sum total not reaching 100 students. All are schools that exist in rural, regional and at times remote, parts of NSW and that cater for the families of these communities.

## 1.9 Definition of Terms

The terms in this research, including those that are specific to the VSSSP, are defined below; specific terms were part of a language developed by the school staff, parents, and staff at participating schools to ensure understanding of which school was being referred to in a conversation:

- *Bush* is an Australian colloquial term that refers to country areas or rural, regional or remote areas.
- *Family* designates the cohesive unit of two or more generations as identified by the research participants. Families may or may not live in the same house.
- *Giftedness* refers to the possession of outstanding natural abilities, called aptitudes, in at least one ability domain (or area of expertise), to a degree that places an individual at least among the top 10% of their age peers (Gagné, 2011).
- *Local school* in this context means the local public secondary school in the rural or regional community in which a student or teacher resides. It is the

school that is attended for face-to-face lessons and is a bricks-and-mortar school.

- *Local school support person* designates the person on the local school staff who is a dedicated liaison between the virtual secondary school provision and the local school. These staff facilitate communication between the two schools to ease the experience and facilitate the communication with students. They also provide the adult–adult or teacher–teacher contact that is required in any school.
- *Mainstream* refers to the classes a student attends or a teacher conducts at their local school.
- *Pod* refers to the small group of students that met online with one teacher for lessons. Another name for this group may be *class*. It is the section of the Year group taken by one teacher for lessons. In the VSSSP pods usually contained 10 students.
- *Res* and *camp* are abbreviations of the terms residential school and residential camp, respectively. Both refer to a two-night and two-day event involving students and staff travelling to one central destination to conduct lessons at the same physical location. Staff and students also had time to socialise together at these events after school and in the evenings.
- *Selective secondary school* designates a public secondary school that accepts its students on the basis of academic merit alone.
- *Synopp* is a colloquial vocabulary term developed by the VSSSP staff that was used to describe a synchronous opportunity or overlapping available space in the lesson schedule of both staff and students. This space would then



allow a synchronous online lesson, or synopp, to take place either between one teacher and one student or a number of students and one teacher.

- *Talent* refers to the outstanding mastery of systematically developed abilities, called competencies (knowledge and skills), in at least one field of human activity to a degree that places an individual at least among the top 10% of age peers who are or have been active in that field (Gagné, 2011).
- *Virtual secondary school provision* designates schooling carried out or accessed by means of a computer.

## 1.10 Overview of Thesis Structure

This thesis has a traditional structure. Chapter 1 has given the reader some background to the research and context for what will follow. Chapter 2 provides a literature review and the rationale for undertaking the research. Chapter 3 describes the research methodology and method, and clearly identifies the research question, then Chapter 4 is broken into several parts to report the results from each main group of research participants. Section 4.1 reports results from the student and parent perspective, Section 4.2 results from the staff perspective and Section 4.3 results from the perspective of Principals from partner schools within the VSSSP. Section 4.4 shows the results from standardised external tests completed by the students when they were in Year 7, Year 8 and Year 9. Chapter 5 is a discussion of all reported results in relation to the research questions and Chapter 6 presents the conclusions drawn from this research and provides further clarity regarding answers to the research question; limitations and suggestions for further research are also included in this chapter. The Appendices are labelled alphabetically, chronologically in the order they are mentioned throughout the thesis.

## **Summary of Chapter 1**

This chapter has described the context of the virtual selective secondary school provision that operated from late 2009 to the end of 2014 in government schools in rural, regional and remote western NSW. The students, the teachers, the parent body and the physical schools in which the VSSSP operated have been described as well as the geographic nature of the area in question. Operational detail of how virtual lessons took place, where virtual lessons took place and how students and staff became involved in the virtual provision have been explained. The motivation for undertaking this research has been revealed and my position as an insider researcher has been openly declared. The terms for the research have been defined to build a clear understanding between researcher and reader throughout the following chapters.

In Chapter 2 relevant literature is critiqued to build the case for undertaking this research. A gap in current knowledge as at the start date of this research in 2013 is identified and the research question is stated. The literature review also explores research that has been published in the years since data were collected for this thesis and that may help to explain some of the observed phenomenon.

## Chapter 2: Literature Review

Chapter 1 described the background and context of the research, shared operational detail of how the virtual school worked and established in broad terms the aims of this research. In this chapter, Chapter 2, existing research that has helped establish current knowledge will be outlined. This knowledge will include who gifted students are and how they are identified; what it is like to attend school in a rural, regional or remote area; the influence and importance of teachers of gifted students; and other factors that might impact on the learning of gifted students in rural, regional and remote schools. Research into gifted students will be critiqued to build a picture of the students in this case study – their characteristics and their social, emotional and educational needs. Then, research into where these students attend school will be examined, including research into educational opportunities in rural, remote and regional areas in NSW, Australia. Following this investigation, research related to the use of technology in education will be explored, in particular the use of technology to support education of gifted students in rural, regional and remote locations. The focus of the literature reviewed will then shift to teachers of gifted students before moving into contemporary understandings of the nature of the learner in a 21st-century learning environment – the skills that are considered essential, and desirable graduate attributes. The final part of this chapter will be a presentation of the case for this research to be undertaken and suggestions about how it might lead to new knowledge in the field.

### 2.1 Introduction to Gifted Students

As a group, gifted students have been studied, and advocated for, since the early part of the 20<sup>th</sup> century. In her history of urban gifted education, VanTassel-Baska (2010) refers to the 1926 work of Hollingworth in opening a school for gifted

elementary school students in New York prior to 1930. Other recent research by Gallagher (2015) refers to the early work of Terman in 1925, who undertook the largest longitudinal study of gifted students to date, by following 1500 gifted students over a period of some 30 years. Feldhusen (2001) references this longitudinal study which was still in progress at the time of publishing and goes further by adding that “The legacy of Terman has led to worldwide interest, concern, research and educational effort...with the establishment of the World Council of Gifted students...and the European Council on High Ability” (Feldhusen, 2001, p. 165). To further support the influence of these two early authors Delisle (1999) describes the work of Terman and Hollingworth in the 1920s as Number 1 and Number 3 respectively in his Top 10 Events in gifted child education in the 20<sup>th</sup> century (Delisle, 1999, p. 31). Gifted students were described over 90 years ago as having precocity and the ability to learn at a much faster pace than students of average or lower ability. Terman and Hollingworth, in their work of the mid-1920s began the suggestion that giftedness was a combination of natural or untrained ability, which had been identified using intelligence tests, and the environment in which the individual was immersed. The influence of that work continues today.

### **2.1.1 Identification of Gifted Students**

Gifted athletes are easily identified, often using an objective measurement device such as a stop watch. If we use swimming as an example sport, there is a well-structured progression where athletes earn their way to more and more challenging competitions by achieving success as the first few place-getters of a particular event. An Australian competitor at the Olympics Games has worked their way through local, regional, state and national level competitions to earn the opportunity to represent their country at an international level (Swimming Australia Limited, 2016).

This trajectory assumes first, that the family of the gifted athlete values such things as sporting prowess and second, that the family is prepared to dedicate the time, effort and money required to turn potential into actual achievements (Gagné, 2008).

Gifted learners may be more difficult to identify as there is no objective measuring device such as a stop watch. However, some general characteristics have been agreed upon in a wide body of rigorous research. These characteristics include the capacity to learn at a much faster pace than others; the capacity to find, solve and act on problems more readily; and the capacity to manipulate abstract ideas and make connections (Gross, Macleod, Slep & Pretorius, 2001; Gross, Merrick, Targett, Chaffey, MacLeod & Bailey, 2004). Keating (2009) added to this list that gifted students display exceptional ability or uncommon promise in the classroom. Over time, research has demonstrated that gifted students have more characteristics in common other than the ability to learn at a fast pace. Pfeiffer (2012) presents the following list of characteristics from a comparison of research conducted over a 100-year period

advanced language and reasoning skills; conversation and interests more aligned with older children and adults; impressive long-term memory; intuitive understanding of concepts; insatiable curiosity; advanced ability to connect disparate ideas and appreciate relationships; rapid learning; and heightened sensitivity (p. 5).

Intelligence Quotient (IQ) tests are designed to assess cognitive ability and were an early form of identification of gifted students. The work of Terman and Hollingworth in the mid-1920s, as stated in the introduction to this chapter, used IQ tests to identify children with the cognitive capacity to take part in their research or school. However, more contemporary research indicates that many IQ tests have an

inbuilt cultural bias that disadvantages students of colour, low socio-economic background and whose first language is not the language used in the test (Borland, 2009). In Australia, the use of IQ tests has been shown to disadvantage Aboriginal and Torres Strait Islander students who may lack the cultural experiences required to complete the tests to a high standard (Chaffey, Bailey & Vine, 2003). Earlier identification processes that used IQ tests alone have now been abandoned in favour of more robust and inclusive identification procedures that take into account cultural and socio-economic diversity, and the characteristics described in the analysis of research by Pfeiffer (2012). This type of meta-analysis was expanded upon by Hodges, Tay, Maeda and Gentry (2018) who also found that traditional identification methods such as IQ tests actively disadvantaged students from culturally, linguistically and economically diverse families. Socio-economic disadvantage is cited as being of major concern to the outcome of traditional IQ tests (Borland, 2009) and as such the use of IQ tests alone to identify giftedness in children has become less frequent in Australia.

One of the most prolific researchers in the gifted education field, François Gagné, has significantly influenced understanding of gifted students in Australian schools. Gagné's differentiating model of giftedness (Gagné, 2008) forms the basis of gifted education policy in all Australian states and territories via the Australian Curriculum, Assessment and Reporting Authority (ACARA) that determines the minimum curriculum for all schools in Australia. ACARA refers to gifted children as exhibiting an "almost unlimited range of personal characteristics in temperament, personality, motivation and behaviour" and adhering to no standard pattern, stating that "gifted individuals come from diverse backgrounds and are found in all cultures, socio-economic levels and geographic locations" (2013, p. 2). As such ACARA's

advice to principals, teachers and schools is that the most generally accepted definition of giftedness and talent is the model put forward by Gagné (2008). This model will now be explored in more detail.

Research by Gagné over an extended period of time (1985, 1991, 1995, 2003, 2008, 2010, 2011, and 2013) proposed a differentiating model of giftedness that describes the interaction of natural or untrained ability with catalysts that might serve to transform this potential ability into something that can be seen and measured. Gagné (1985, 1991, 1995, 2003, 2008) names this visible ability talent, and asserts that without catalytic inputs such as time, effort and financial resources, giftedness may remain as potential and never reach the actual. Gagné (1995, 2003) also asserts that there is a certain amount of chance that will influence this transformation of gift into talent. This chance factor may include the socio-economic circumstances a child is born into, the milieu of people surrounding the child including friendship groups and academic peers, and being in the right place at the right time when a provision to meet the educational needs of gifted students is implemented (Gagné 2003, 2008). Importantly, Gagné describes the intrapersonal characteristics of the student as making a significant contribution to the transformation of potential into actual, with the inherent volition or motivation of the student being of critical importance (Gagné 2003, 2008, 2010, 2011, 2013). The notion of inherent motivation will be addressed in more detail in a subsequent section of this chapter.

Other models of giftedness that have been postulated over the last 40 years include Renzulli's three-ring model (Renzulli, 1978, 2005) and Tannenbaum's sea star model (Tannenbaum, 1983, 2003). The Renzulli model (1978, 2005) looks at the interaction between three clusters of necessary human traits: above-average general abilities, high levels of task commitment, and high levels of creativity. The model

suggests that giftedness is a result of interactions among these areas and can be applied to any area of human performance. Tannenbaum's sea star model suggests that giftedness in a child is their ability to become an adult with a developed talent. He describes five characteristics that would promote this development: general intelligence; special aptitude in a specific area; non-intellective requisites such as the ability to remain focused as well as motivation and assured self-concept; environmental supports such as a positive and proactive environment for developing gifts; and finally the high-level influence of chance that allows fortuitous factors such as environment and persons of influence to play a role in the developmental process.

The students in this case study attend school in the state of New South Wales (NSW). As such the identification material and methods used by the state department of education have been used to inform this research. Chessman (2007) states that:

Giftedness corresponds to potential that is distinctly above average in one or more domains of ability and talent refers to performance that is distinctly above average in one or more fields. Gagné's model includes five aptitude domains: intellectual, creative, socio-affective, sensorimotor and a category called others for those aptitudes that have yet to be discovered. Students may be gifted in one or more of these domains of ability and these abilities may combine in different ways to produce specific talents (p. 1).

In summary, identification of gifted students in Australian schools is achieved by a combination of close observations of a child recorded by the parent or teacher. Observations may be reinforced by academic success in standardised tests in school-age children. In some cases a test of cognitive ability may be performed, which will be combined with material collected from a number of other sources. For the purpose



of this research, students are identified as being gifted through a general test of reasoning and problem-solving ability coupled with previous performance in academic and cultural areas as identified by the teachers of these students in their regular classroom (NSW DoE, 2018).

### **2.1.2 Educational Needs of Gifted Students**

Once gifted students have been identified, there is a requirement to do something with their apparent superior cognitive capacity. A comprehensive meta-analysis of over 200 research articles from 1861 to 2006 by Rogers (2007) revealed five practices that have been shown to enhance outcomes for gifted students. First, there must be daily challenge in the work offered to gifted students. Second, students must be offered opportunities for independent work with structured support in order to develop their independent study skills. Third, students must be given opportunities for acceleration. Acceleration includes curriculum compacting (removing work already mastered) and either subject or year advancement (sometimes referred to as grade skipping). The fourth recommendation is that gifted students must be offered opportunity to work with like-ability peers, and finally, curriculum modification must take into account the learning needs of gifted students, such as their faster pace of learning and the need for less practice and review.

Research into pedagogies that cater for the educational needs of gifted students is well established internationally and in Australia. There is a body of evidence to support grouping gifted students together for curriculum instruction. Henderson (2007) refers to the benefits that can be realised when students are with their intellectual-age peers rather than their chronological-age peers and the learning material is more fit for purpose for this more intellectually homogeneous group. Kettler (2011) also supports grouping of like-ability students when matched with

teachers who have been trained in differentiating lessons to meet the learning needs of the high-ability group. Neihart (2007) draws from a wide range of research to present recommendations to support grouping gifted students together. Reasons to support the recommendations include an improved academic self-concept and more development in career interests. Neihart (2007) also states that members of a minority cultural group, who were able to form a cohesive peer group in a high ability class, also better managed the social geography of the school (p. 335). Rogers (2002) described the effect size (ES) of a range of ability grouping measures. Given that an effect size  $+0.30$  is considered to indicate effects that are significant at a practical level (Rogers 2002, p. 104), ability grouping for enrichment (ES .33), cluster grouping for specific instruction (ES .33) and cross-grade grouping in reading and mathematics (ES .45) all show favourable results for academic achievement by gifted students who have been grouped together for instruction. Further support for grouping gifted students together is provided by Brulles and Winebrenner (2011) who explored the benefits of providing gifted education services on a small financial budget. Their research states that grouping is one way to serve the educational needs of gifted students to work with others who share similar interests, are ready for more challenging levels of complexity and share similar learning preferences whilst not incurring significantly more cost to the school. Bate and Clark (2013) suggest that academic, social and emotional outcomes for gifted students were enhanced when gifted students were grouped together for instruction in a one-day-per-week withdrawal program in New Zealand, and Vogl and Preckel, (2014) recommend full-time ability grouping as a means to meet gifted students' need for fast-paced delivery and advanced study whilst at the same time facilitating better student-teacher relationships.

There is also research that suggests grouping gifted students together for instruction is not always successful. First, this research suggests that academic self-concept is diminished and motivation decreased when gifted students are grouped together full-time, resulting in lowered academic ranking. Brulles, Saunders and Cohn (2010) claim there is little empirical evidence to support cluster grouping as an effective tool to meet the needs of gifted children. Their research was based on a metropolitan school group in Arizona USA who chose not to cluster-group gifted students but to train teachers in differentiation strategies instead. The remainder of schools in the research sample chose to cluster-group gifted students for instruction but did not train teachers in differentiation strategies. The sample of gifted students, not cluster grouped but with trained teachers, out-performed the cluster grouped sample. Brulles, Sanders and Cohn (2010) postulate that it is not grouping gifted students together, but training teachers that is important. Second, Chessor (2014) conducted research in a group of NSW schools to see if there was any change in motivation as described by mastery or achievement goal orientation between gifted students grouped together and those who were not. Mastery goal orientation is where a student completes the task in order to improve the level of competence and achievement goal orientation is where a student completes the task in order to achieve better marks or beat others (Chessor, 2014). Findings showed that motivation to learn, whether for mastery or performance goal orientation, declined over time in both grouped and ungrouped gifted students and could perhaps be more related to pre-adolescent developmental influences than grouping. Preckel, Götz and Frenzel, (2010) investigated gifted ninth-grade students (aged 14–15 years) in one Austrian high school who were grouped together for mathematics instruction. Their research aim was to understand any change in academic self-concept. The research found that

for some gifted students, academic self-concept decreased quite quickly at the beginning of the year as reported by students in questionnaires, but with interventions such as an individual frame of reference or personal best feedback from teachers, academic self-concept was able to be restored as the year progressed. A similar phenomenon is described by Marsh and Craven (1997) as the “big fish, little pond” phenomenon whereby a student who is accustomed to succeeding at the top of the class in a mixed-ability setting, often without having to apply much effort to learn the content, is shocked when they are placed with a greater number of students with similar academic ability to their own. In the more homogeneous ability group, the former star student may not achieve at the top level. The student has moved from being in a small pond or a small group of gifted learners, where they are the celebrated high achiever, to being just one of the group, or a median achiever, in a larger pond or larger group of gifted students. The negative impact on self-concept is noted as being a reason not to group gifted students together all the time (Seaton, Marsh & Craven, 2010). The notion of academic self-concept will be explored further through the nature of the learner in Section 2.5.

Conversely, a discussion paper published in July 2018 by the Centre for Policy Development (Ho & Bonner, 2018) criticises grouping highly academically able students together into what is known in NSW as selective schools, as the practice created a “brain drain” at nearby local and Catholic schools when partially selective schools were opened in 2010 (Ho & Bonner, 2018, p. 5). The authors also suggest that grouping gifted students together may result in harm to society generally due to “institutionalised segregation”. This discussion paper, whilst published by a highly creditable organisation appears to reference mainly non-peer-reviewed articles as a basis for their position.

There is wide international acceptance of, and rigorous research to support, differentiation of the curriculum for gifted students (VanTassel-Baska 1992, 1993; VanTassel-Baska & Brown, 2007; Tomlinson, 1994, 2005; Wormeli, 2005). This collection of research suggests that gifted students cannot be expected to manage with curricula designed for the majority of students, and it is recommended that the curriculum must be based on gifted students' advanced abilities that include their cognitive, aesthetic, affective and social needs (Chessman, 2007). In their seminal publication about educational service to gifted students in the USA, Colangelo, Assouline and Gross (2004) state "[gifted students] want to be challenged academically... and they require a very different curriculum, a curriculum planned for the motivated and highly able student" (p. 29).

As a complication to the process of grouping gifted students together in academically selective high schools, the NSW DoE (2018) in their review into access to academically selective schools, found that the current selection process advantages students from high socio-economic families with well-educated parents (NSW DoE, 2018, p. 7). Whilst this notion does not diminish the potential benefit to gifted students from working together in a more academically homogeneous cohort, it does suggest that access to the opportunity to attend these selective schools through the entry examination process is not equally available to all gifted students from all socio-economic strata, as it is intended to be.

Curriculum differentiation methods have been suggested by a variety of authors. Maker (1982), Williams (1993), Kaplan (1986) and Krathwohl (1964) suggest curriculum modification methods to adjust or differentiate curriculum to better suit gifted learners. The seminal work of Bloom (1956) on higher-order thinking is also considered useful in adjusting the level of work to be attempted. The

adjustments suggested by these authors include modification to any or all of the content to be taught, adjustment to the process of learning, adjustment to the product required to demonstrate understanding or adjustment to the learning environment where there is persistent challenge to encourage higher-order critical and creative thinking (Gross, MacLeod, Sleaf & Pretorius, 2001; Gross et al., 2004). Indeed, many of the strategies for gifted learners are described as quality teaching for all learners (NSW DEC, 2015).

Conklin (2007, pp. 83-84) in her book on differentiation strategies for mixed-ability classrooms synthesises the work of Kaplan (2002) into suggestions for depth and complexity that can differentiate learning material so it better suits the educational needs of gifted learners. This differentiation includes adding dimensions of depth (the language of the discipline, details, patterns, trends, unanswered questions, rules, ethics and big ideas) as well as dimensions of complexity (over time, different perspectives and interdisciplinary interactions). This approach allows the teacher to cater for gifted students in the mixed-ability classroom or to differentiate for students who even though they are in a similar-ability class, are still far more cognitively advanced than their peers.

Traditionally whole-grade acceleration or single-subject acceleration has been used as a method to meet the educational needs of gifted students in rural and regional areas (Chessman, 2007). These approaches may have been implemented due to a lack of other opportunities available owing to geographic isolation and small populations. In their study, Gallagher, Smith and Merriotsy (2012) found that parents of gifted students accelerated by a whole grade later in their school career, reported the social adjustments feared by many parents were not an issue. This study also found that subject acceleration earlier in the child's school career was a good way for

parents to become more accepting of acceleration as a strategy to meet their child's learning needs. Olthouse (2013) investigated teachers of gifted students in rural areas and assessed their attitude to acceleration as a strategy. The study found that there was a need to provide professional learning for teachers in the area of gifted education, in order for them to accept acceleration as a strategy.

Acceleration allows flexibility in curricula or pacing, and the use of resources intended for older students with young academically advanced students (Gross et al., 2004; VanTassel-Baska, 1992). However, acceleration has some challenges such as students potentially learning about issues that require a greater level of emotional maturity than they currently possess (VanTassel-Baska, 1993) and is sometimes seen as unfair or elitist by teachers (Olthouse, 2013; Wardman & Hattie, 2012). Other studies suggest that to attach an unfair or elitist label to a school's attempt to meet the needs of gifted learners has the needs of other learners foremost (Jolly, 2009; Jolly & Kettler, 2008).

### **2.1.3 Social and Emotional Needs of Gifted Students**

There is a considerable body of evidence supporting the need to understand and sustain gifted students' social and emotional needs, commonly referred to as affective needs, in order to facilitate positive educational outcomes. Some affective characteristics of gifted students include a highly developed sense of justice, an increased capacity for empathy, a mature sense of humour, emotional intensity and, in some cases, perfectionism (Gross et al., 2004). Silverman (2007) expands on the potential positive and negative impacts of perfectionism by suggesting "perfectionism has one face with the potential for propelling an individual toward greatness and the other with the power to immobilize" (Silverman, 2007, p. 243). Neihart (1999) states that the psychological well-being of a gifted student is related

to the intersection of their educational fit, their personal characteristics such as temperament and their type of giftedness.

One of the well-researched affective needs of gifted students is the need to feel a sense of belonging. Belonging is an important part of adolescent life and as such is an important part of a gifted student's life:

Adolescents participate in a complex social environment populated by many friendship groups, cliques, and crowds. The desire to belong to a group may influence an adolescent's behaviour well before he or she is actually a member of the group. Individuals may change their behaviour in order to gain peer acceptance (Newman, Lohman & Newman, 2007, p. 242).

The seminal research into the forced-choice dilemma (Gross, 1989), which continues to be a focused research area, describes how gifted students may choose to hide their academic abilities in order to enhance their social abilities to fit in with others. This dilemma is problematic for many gifted students (Jung, Barnett, Gross, & McCormick, 2011). A sense of belonging has been shown to be of great importance to gifted adolescents if they are to achieve to their potential. Silverman (1998) describes the need to belong, for gifted students of all ages, as being of crucial importance; there is a great need for intellectually similar peers to avoid feelings of loneliness. In addition, self-esteem is reportedly increased when gifted students have regular opportunities to interact (Plunkett & Kronborg, 2007). This situation could be due to their "not having to hide their talents to gain acceptance, being able to learn at a faster pace, to express their ideas and not be regarded as a 'nerd' by their peers and by being surrounded by other highly motivated students" (Plunkett & Kronborg, 2007, p. 41). A cultural element may be present in the forced-choice dilemma as Jung, McCormick and Gross (2012) describe no such dilemma amongst some



cultural groups of gifted students. Hofstede (1997) suggests this difference may relate to their acceptance of an unequal human society, owing in part to their cultural background.

### **2.1.4 Underachievement by Gifted Students**

Gifted students do not always achieve at the top academic levels. Whitmore (1980) succinctly described underachieving gifted students as those who show great academic promise then fail, for no apparent reason, to perform at a level commensurate with their previously documented abilities. Further research has argued that a lack of challenge in the school work presented to gifted students could lead to boredom, frustration and a loss of self-esteem (Crocker, 2004), which combine to have a negative impact on academic achievement. Other research describes how gifted students with complexities such as a learning difficulty may belong to this group of underachieving gifted students (Gross et al., 2004). Chessman (2007) states that rural and regional schools have small populations of gifted students and as such catering for their needs poses more challenges. For example, there are often no other schools close by, no tertiary institutions that the student could attend concurrently with school attendance, and a small likelihood of finding a group of like-minds simply due to the small population numbers. Consequently, gifted students in rural areas are frequently underserved and therefore at great risk of underachievement (Rechek-Bleske, Lubinski & Benbow, 2004). With a cohort of similar-ability students, research suggests gifted students learn faster and more effectively, develop a better attitude to ability and to school, and are less tempted to underachieve (Kulik & Kulik 1984, 1992; Olthouse, 2013).

### **2.1.5 Policy to Support Gifted Students in Australia**

Policy to support the needs of gifted students in Australian schools is embedded at the state/territory government education department level in all but one state, Tasmania. All states/territories that have a policy to support gifted and talented students in schools base their policy on the research of François Gagné (Gagné, 2003, 2008). The Australian Capital Territory Department of Education and Training (ACT DET, 2014) and Queensland Department of Education, Training and Employment (QLD DETE, 2012) use both the 2003 and 2008 versions of Gagné's Differentiating Model of Giftedness and Talent to underpin their policy, whilst the Northern Territory Department of Education (NT DoE, 2016) and Western Australia Department of Education (WA DoE, 2011) use the 2008 model only. Victoria Department of Education (VIC DoE, 2015), South Australia Department for Education (DfE, 2016) and New South Wales Department of Education (NSW DoE, 2006) refer only to the 2003 version of Gagné's model and the Tasmanian Department of Education (TAS DoE, 2012) does not publish a gifted and talented student policy on their website but does publish a procedures document to support catering for the needs of gifted learners.

In essence, state-level policy in Australia demands the identification of gifted and talented students, followed by the development of an individual learning plan to support the gifted learner, but does not use the research by Gagné to mandate how this can happen. Responsibility of all stakeholders is outlined including senior government department officials, school principals and classroom teachers. It is curious then to note the lack of currency in the policy from several states, and the lack of update to policy documents; for example, NSW DoE appear not to have updated their policy for gifted students since 2006, other than to make minor contact

detail changes and base the current NSW policy on a superseded version (2004) of Gagné's research model. This apparent lack of care is further exposed by the work of Merrotsy (2017) who identifies that there is no national policy for gifted and talented students:

...no Australian federal legislation, policy or funding specifically for the education of gifted and talented students. The term "gifted education" or similar is not acknowledged in any federal government document. There is no national institution for the education of gifted and talented students. There is no national target with respect to the education of gifted and talented students (p. 31).

In support of implementing policy even if it is a little out-of-date, Long, Barnett and Rogers (2015) in their study of 10 government secondary schools in NSW investigated how the NSW DoE gifted and talented policy implemented in 2004 had contributed to gifted program quality and scope at the school level. Their findings include that those schools with a documented policy that had been based on the state policy, were more likely to provide more substantially for their gifted students by providing adequate resources and professional development for their staff (p. 131). An interesting finding is that at times, principals often wanted to do more to cater for the educational needs of their gifted students, but did not have the resources to do so (p. 133).

For the purposes of this case study, the Gagné model from 2008 will be used. The model can be seen in Appendix A. In essence, this model describes that gifts are natural abilities which may or may not be discernible, that is, they could simply be a potential that is not yet revealed but which may be transformed into talent, which is always discernible and measurable, through a process of change. The process of

change needs catalysts such as time and effort, and resources such as money, in order to develop natural gifts (or potential) into talent. Without the developmental process, the gifts may remain as potential only. In addition, there is an underlying chance factor which, according to Gagné (2008), will influence the developmental process. Chance factors include the socio-economic environment the child is born into, the milieu surrounding the child such as friendship groups that the child associates with, the teachers they interact with, and the family friends who might influence thought and action. The chance factor also allows for such things as political change which may have an influence on the school a child attends and the programs on offer at that school. All of these factors will in turn be influenced by the natural tendencies, or intrapersonal characteristics of the child such as their personal motivation and volition to undertake the developmental process through the application of time and effort. Gagné's model (2008) captures the complexity of what it is to be a gifted child and the exponentially difficult developmental process that is required in order to transform these gifts into talents.

### **2.1.6 Summary of Section 2.1**

Section 2.1 has examined the literature available in order to understand gifted students. This literature includes how gifted students are identified in Australian schools, some general characteristics common to many gifted students, and their educational and social/emotional needs. Gifted students who do not fit the generally accepted pattern of academic achievement have been mentioned and current policy to support the education of gifted students in Australian schools has been described.

The research examined in this section supports grouping gifted students together for instruction, recognises the social and emotional sensitivities of gifted students, shares that gifted students often show a precocity well beyond their

chronological age and shows that gifted students have their own place in educational policy in Australia. In particular, this section describes the difficulty of catering for the educational needs of gifted students in low-population rural, regional and remote areas where a similar-ability cohort may not be readily available and the impact this situation may have on the sense of belonging that a gifted student may experience.

## **2.2 Rural, Regional and Remote Secondary School**

### **Students**

In order for the research context to be better understood, this section of the literature review will expand on current understandings about rural, regional and remote education for gifted students.

### **2.2.1 Education for Rural and Remote Secondary School**

#### **Students**

Research suggests that despite the ongoing efforts of successive state and federal governments, educational outcomes for students in rural, remote and regional areas in Australia continue to be unequal to outcomes achieved by students who attend school in a metropolitan setting. This research includes information promulgated from 1998 to 2009 by the Australian government, the NSW government, the NSW Teachers Federation, the Human Rights and Equal Opportunity Commission and a Senate Standing Committee (NSW DEC, 2013a). Internationally, a similar position is described (Brown, Avery, VanTassel-Baska, Worley, & Stambaugh, 2006) where legislation and policy from successive governments have not necessarily been aligned. This context has impacted on the daily life of gifted students (Brown et al., 2006, p. 11) across the five North

American states included in their study: Indiana, North Carolina, Pennsylvania, South Carolina and Virginia.

In research conducted by the NSW DEC (2013a), national tests of literacy and numeracy in Australia, known as NAPLAN (National Assessment Program for Literacy and Numeracy), were compared between 2008 and 2012 for students in remote, provincial and metropolitan areas of Australia for students in Years 3, 5, 7 and 9. The chronological ages of students in these Year groups are approximately 8, 10, 12 and 14 years. The state of NSW saw the largest widening of the gap in achievement scores between remote and metropolitan students, with the gap increasing in size by up to 57% over the four-year period. NAPLAN results are expressed as a point score between zero and 1000 divided into Bands of 100 points, for each of five different measures of literacy and numeracy. Each student in Years 3, 5, 7 and 9 may achieve a score between zero and 1000 in each of the five areas, that is, the full scale is available to all students in all Years. However, in practice students fall within 4–6 consecutive Bands in each Year group. An average Reading and Numeracy NAPLAN score in 2012 for a metropolitan student in Year 9 was close to 600 points whilst the average score in 2012 for a remote or regional student in Year 9 was around 525 and 575 points respectively (NSW DEC 2013a, p. 4).

In this same NSW DEC research, Higher School Certificate (HSC) achievement data, for students who have completed this final set of exit examinations from school, showed a widening gap in outcomes over time between students who attend a rural and regional school and those who attend a metropolitan school (NSW DEC, 2013a). HSC achievement data gathered from the NSW Educational Standards Authority (NESA) which administers the HSC examinations, showed that students from rural and remote schools achieved nearly twice as many scores in the lower

levels and only half as many scores in the top levels as compared with their counterparts in metropolitan schools (NSW DEC, 2013a). Research places socio-economic status (SES) differences as the main reason for the difference in educational outcome: “Relative to metropolitan schools, regional schools in New South Wales are concentrated at the bottom end of the SES spectrum, with 65 per cent of provincial and remote schools in the two lowest SES quartiles” (NSW DEC, 2013a, p. 5). Additional factors that influence education in a rural, regional or remote setting include school and class size, the nature of the local community and the lack of availability of transition programs to assist students into and out of school (Lowrie, 2006).

The lower educational outcomes for regional and remote students do not stop at school but continue on to influence university aspiration and attendance. Research conducted by the Program for International Student Assessment (PISA) showed that students attending a metropolitan school were more likely to aspire to attend university and to enact this aspiration, with non-metropolitan students being around 50% less likely to aspire to, or attend, university (NSW DEC, 2013a, p. 23). The impact of experiencing less exposure to careers that require a university degree, which could possibly broaden aspiration to attend university, has been shown to influence the educational outcomes and aspirations of rural and regional students (NSW DoE, 2015). Additional factors are the emotional and financial cost of relocation to attend university as well as the lack of relevant career role models in some rural and remote communities (NSW DoE, 2015). As well, the limited access to senior school subjects at an advanced level in some rural and regional schools has a negative impact (NSW DEC, 2013a).

A comprehensive report by Halsey (2005) investigated pre-service teacher placement in rural and remote locations. One of the continuing issues reported was that teachers may not be well prepared for teaching and living in remote locations and may not receive the professional support they require as early career teachers. Incidentally, in a follow-up report by the same author published in 2018, this same recommendation is still mentioned as being of critical importance: “Notwithstanding the efforts of governments, attracting and retaining the best teachers for regional, rural and remote schools continues to be one of the most persistent challenges on the ‘education agenda’ ” (Halsey, 2018, p. 17). In his final report for the independent review into regional, rural and remote education, Halsey (2018) identified several factors experienced by students in these areas that are not experienced by their metropolitan counterparts. These factors include the need for teachers to be specifically trained in the context of rural, remote and regional areas, and the need to ensure they receive professional support as they progress through their career; that the availability, affordability and accessibility of high quality, diverse, work experience opportunities for school students is reduced; that the cost of living away from home to access further study may prevent some students from attempting university study; that the availability, affordability and accessibility of ICT resources in rural, regional and remote schools, communities and homes is reduced and that the relevance of school assessment practices to rural, regional and remote areas needs to better suit the context of these areas: “The key challenge for regional, rural and remote education is ensuring, regardless of location or circumstance that every young person has access to high quality schooling and opportunities” (Halsey, 2018, p. 8). Curiously, Halsey (2018) also reports no change to any of the challenges that have



been described in literature up to 2015 and cited above, despite the efforts of successive state and federal governments.

### **2.2.2 Summary of Section 2.2**

The state of educational outcomes for students in rural and regional areas of NSW is described in research as not being in good shape in 2013 and there is no research since then to suggest there has been any change, with an ever-widening gap between the educational outcomes of students who attend metropolitan schools and those who attend schools in rural, remote and regional areas. To attest to this gap the NSW government produced a Rural and Remote Blueprint for Action to try to redress the issue (NSW DEC, 2013b). The Rural and Remote Blueprint for Action initiative from 2013 is still the current initiative as at December 2018 (NSW DoE, October 2018). This state government initiative allocated more than \$112 million extra to schools in rural, regional and remote areas of NSW to support equity funding (NSW DEC, 2013b, p. 7). The funding is to be used to support education from preschool (age 3 or 4) through to Year 12 (age 17 or 18) with a focus on developing and retaining high quality teachers, ensuring access to preschool education for all students in the year before they start school, and funding to support early career teachers with extra release time from face-to-face teaching in order to spend this time with an experienced mentor.

## **2.3 Technology and Learning**

### **2.3.1 Technology in Education**

Technology has been used in education in rural and remote areas for a variety of purposes. It serves to connect teachers together into a learning community: “People who share a passion for teaching and strive for excellence in their profession often rely on regular interaction with a network of similar people” (Trinidad &

Broadley, 2010, p. 23). Technology enables this connection in rural and remote areas as well as in metropolitan settings. However, some consider the real purpose of technology in education is to integrate educational technology, or resources leveraged to support the educational processes involved in learning and teaching (Roblyer & Hughes, 2018), in such a way, as to transform learning. Technology could be used to replace instructional technique to make the task more appealing, or to amplify instructional practice so as to streamline delivery, or to transform instructional methods so that there is a restructure of the learning process and learning that is not possible without technology, is enabled (Hughes, Thomas & Scharber, 2006 as cited in Hughes, Ko & Boklage, 2017).

Such is the conviction of the Australian Government that technology-enabled connection is important, it has invested AU\$19.9 billion in technology infrastructure over the period 2008–2015 (Australian Parliament, 2012). With 85% of the population of Australia living within 50 km (31 miles) of the coastline (Walker, Porter & Marsh, 2012, p. 8) and the promise of the Australian Government to reach 90% of premises with the National Broadband Network (NBN) (Australian Government, 2010, p. i), technology use within education appears to be supported. However, many of the 15% of the Australian population living in rural, regional and remote areas also live/work in the 10% of households, businesses and schools that are not served by high-speed fibre NBN (100/100Mbps). These households, businesses and schools are served by the slower speed satellite service (12/12Mbps) provided in the NBN rollout (Australian Government, 2010). Thus rural, regional and remote schools operate with just 12% of the internet speed capacity of metropolitan schools, which may have an impact on service quality or availability. Such is the concern of the people living and working in rural and regional Australia

in regard to the inferior services offered, that the Parliament of Australia has launched an inquiry into the services offered to rural, regional and remote Australia as part of the NBN service (Australian Parliament, 2018).

### **2.3.2 Online Learning for Secondary School Students**

There is a body of research to support online learning for secondary school students. It is a relatively new field compared with that of gifted-education research, but it is growing. Two sentiments essentially drive the incorporation of information and communications technology (ICT) into teaching and learning: First, ICT can improve engagement: “Pedagogies that integrate information and communication technologies can engage students in ways not previously possible, enhance achievement, create new learning possibilities and extend interaction with local and global communities” (Curriculum Corporation [Australia], 2005, p. 3). Second, it is important in areas beyond school to be skilled in the use of ICT:

Rapid and continuing advances in...ICT...are changing the ways people share, use and process information and technology. In this digital age, young people need to be highly skilled in the use of ICT. While schools already employ these technologies in learning, there is a need to increase their effectiveness significantly over the next decade (Ministerial Council on Education, Employment, Training & Youth Affairs, 2008, p. 5).

ICT pedagogies enforce student-centred learning as a modality. Grappling’s Technology Spectrum (Porter, 2001) describes three main ways that teachers use technology in the classroom. The first part of the spectrum describes the technology itself as the focus of the lesson. Students learn how to turn the device on, move around within the device or software, save work and exit. This level of learning is essential but can be covered very quickly once familiarity is developed. It is also

very teacher-centred learning. In the second part of the spectrum teachers may incorporate technology simply by digitising existing resources. Perhaps a “fill in the missing word” sheet or Cloze passage is completed using software, rather than by using pen and a printed worksheet. This learning is also quite teacher-centred. The third and final part of the spectrum describes transformative uses or ways in which learning could not happen without using technology. An example might be a task where the student is to create a website to explain something for a new audience. This third level or transformational end of the spectrum is very student-centred. By ensuring the transformation end of Grappling’s Technology and Learning Spectrum (Porter, 2001) is used as far as possible, there is the chance of a greater alignment of student-centred learning in ways that are not possible without technology.

In his 2017 book, *Design of Technology-Enhanced Learning: Integrating Research and Practice*, Australia’s Matt Bower describes how classroom technologies may offer benefits. The term Bower uses is “affordances” and he defines them as “the action potentials inherent in an object (for example, a technology) that determine how it can be used” (p. 67). Technology affordances, or potential benefits from using technology in a classroom, can be grouped into broad categories such as media, spatial, temporal and navigational affordances that improve the capacity of the composer or responder to share, read, write, listen, view, resize, record, link and search in ways that cannot be done without using technologies (Bower, 2017, p. 70). Some of these affordances allow for greater collaboration between individuals or groups and synthesis of materials.

Rapposelli (2012) reports two benefits described by students engaged in online learning. The first advantage is the capacity to submit an electronic form of an assignment and the second is the ability to work with others at another location.

Groundwater-Smith (2007) reports that while students enjoyed constructing their own knowledge rather than writing down the version of knowledge constructed by the teacher, they found the Internet-filtering environment of NSW DEC schools a hindrance to learning. The filtering environment blocked sites that appeared to be relevant to what the student was researching, so causing some feelings of frustration. Bennett and Barbour (2012) report that students in New Zealand of Maori descent sought more opportunity for collaboration and interaction when engaged in online learning. These authors also suggested the need for better preparation of teachers for an e-learning environment.

Student interaction in an online learning space is the focus of several other research articles. Ingerham (2012) describes three types of student interaction in an online space: student–content, student–teacher and student–student. There is considerable evidence that the student-identified need for student–student interaction—as described in the North Carolina public school experience (Ingerham, 2012) and the FarNet experience in New Zealand (Bennet & Barbour, 2012) is of real concern to students. A study by Vu and Fadde (2013) indicates that tertiary students in a live virtual classroom (LVC) preferred to use the typed chat feature rather than voice to communicate due to the technology difficulties that arose when the bandwidth usage in the LVC increased owing to voice/video features. The student–student interaction was highly valued in all three studies of virtual provisions in North Carolina, in the New Zealand research projects for school students and for tertiary students in the study described by Vu and Fadde (2013). This finding is supported by previous research on belonging within adolescent populations (Newman et al, 2007).

Research into using technology to support the development of collaboration in early childhood education by Cicconi (2014) reports several important points. First, without standards for both teacher and student behaviour in an online environment, effective progress could be limited. Cicconi refers to the development and implementation of such standards by the International Society of Technology in Education (ISTE) as essential to successful deployment of these techniques. Second, Cicconi describes in detail some of the benefits of online learning as a tool to encourage collaboration among learners. When students are given the time and space to think before responding to a question, even a reluctant contributor to class or group discussions, such as the student described in the study as having autistic tendencies, may become a regular contributor:

While sitting in the computer lab with Jamie, a first grade student with multiple learning disabilities, his paraprofessional, Allison, watched in awe as he collaborated with classmates via VoiceThread. He posted text comments and even voice recordings explaining how he drew dots to answer the addition word problem. Students responded to his metacognitive thought process in virtual conversations as if they were not at all surprised by Jamie's participation. When the aide asked why she was struck with a look of confusion and disbelief, Allison responded "He never works with other students. He just sits in groups silently even when encouraged" (Cicconi, 2014, p. 61).

This movement of a More Knowledgeable Other (Vygotsky, 1978 as cited in Cicconi, 2014) from the teacher to the student is central to the perceived success of online learning environments. When students are provided with the opportunity to construct their own knowledge, using their peers as both source and critique of ideas,

engagement in learning may be lifted: “Technology simultaneously ushers the tasks of creating, evaluating, analysing, and applying through collaboration into the classroom, while generating greater enthusiasm for learning” (Cicconi, 2014, p. 65).

### **2.3.3 Online Learning for Gifted Secondary School**

#### **Students**

This area of research has received more attention in recent years but is still beset with some issues. Chen, Dai and Zhou (2013) lament the lack of systematic approaches to investigate the effectiveness of technology use for gifted learners, stating “extant studies are sporadic and have rarely examined and evaluated technology use in gifted education” (Chen et al., 2013, p. 167). Some authors describe positive impacts on gifted students who are able to connect with each other through technology. These positive impacts include freedom of expression, control, power, and attaining excellence (Baldus, Assouline, Croft & Colangelo, 2009; Cross, 2004). This notion is further explored through the development of a sense of self and identity by allowing “privacy, immediacy, ownership, imagination, freedom, utility, and...belonging” (Cross, 2004, p. 15) as well as access to talent development and the subsequent positive impact on students from rural settings (Baldus et al., 2009). However, none of these studies makes conclusions on the effectiveness of technology use in educating gifted students: “Well-designed research is sorely needed that goes beyond mere advocacy to articulate the role of technological support and test its effectiveness in achieving specific goals of gifted education provisions” (Chen et al., 2013, p. 167)

Ng and Nicholas (2007) describe some possible benefits for gifted students through online learning, including the potential for gifted students to have autonomy in their learning. An example of this potential is described by Ng and Nicholas:

“gifted students’ membership in today’s technologically oriented society empowers and motivates them to readily embrace this new type of learning opportunity with ease and comfort” (Ng & Nicholas 2007, p. 191). Online learning offers a convenient way for like-minded students to communicate in groups. Ng and Nicholas also suggest that gifted students working asynchronously online in a virtual classroom will need high motivation and a common goal to learn together. The motivation to cooperate may not arise spontaneously so there is a “vital role for teachers to create that motivation extrinsically” (Ng & Nicholas, 2007. p. 191).

A later case study by the same authors (Ng & Nicholas, 2010) examines the effectiveness of online pedagogy as used by 10 students in an extra-curricular activity over six months. Their research describes the support mechanisms required, the retention rate of students and the need for the regular presence of a facilitator to ensure continued motivation in the students. Student reflections included the wish to complete this work as part of the regular curriculum, not as an extra task. The descriptions of student–student social and academic collaboration online were a feature of this case study.

Research presented by Baldus, Assouline, Croft and Colangelo (2009, p. 1226) describes the use of technology in the Iowa Online Academic Placement Academy as an opportunity to overcome geographic barriers to access and as an opportunity for rural and regional students to access excellence. Importantly, this research also describes the impact on the teacher, suggesting that interactive professional development acts as talent development for teachers by “improving teacher effectiveness through collaboration and setting high standards for teachers to learn innovative strategies beneficial to students” (Baldus et al., 2009, p. 1231).



Thomson (2010) undertook an in-depth investigation of gifted students completing curriculum content online, which provided a comprehensive description of perceptions of both teachers and students, albeit with very small sample sizes. This research describes how the online space can meet the needs of gifted learners. A feature is the discourse on access to a broader range of educational opportunities in an online environment compared to a regular school environment. Thomson (2010) describes best practice for online learning, including how teachers structure their online course to support student-directed learning, and the need for good communication between teacher and student and the formation of a strong bond.

Thomson concluded that “there is little to no research on specific online instructional strategies and/or characteristics of the online environment that help to create a successful online learning experience for gifted students” (2010, p. 672) and suggests the need for further research.

Taking up the mantle to conduct further research for teaching gifted students in an online environment, Swan, Coulombe-Quach, Huang, Godek, Becker and Zhou (2015) report that a virtual learning laboratory (VLL) with 45 students within a bricks-and-mortar school in a rural middle school in south-eastern USA, which was administered by the Florida Virtual Learning School, was successful in meeting the needs of gifted students as reported by students, their parents and staff at the local bricks-and-mortar school they attended. The success was attributed to development of 21st-century skills such as collaboration, communication and creative thinking that were a result of the advanced program offered. The Principal of the bricks-and-mortar school reported that all 45 students completed their online studies in the one-year study period and “gained mostly As and Bs in their chosen area” of advanced study (Swan et al., 2015, p. 304). The VLL was an optional choice for students who

had completed all regular curriculum and were able to enrol in advanced placement classes offered online. Swan et al., describe the important role of the local bricks-and-mortar school facilitator who worked closely with the VLL students in order to check that they remained on task and up-to-date with their work.

The darker side of technology use (Pyryt, 2009) cannot be ignored. Gifted students are highly capable of taking part in computer crime (hacking) and due to their insatiable curiosity, may engage with inappropriate websites that give directions for criminal activity or pornography (Pyryt, 2009, p. 1177). To avoid this outcome it is highly recommended that gifted students using computer technology work in a filtered Internet environment and are asked to agree to and abide by an acceptable code of conduct.

A recent study conducted in Europe by Andrejeva and Ostroverkhaia (2017), using university students as the participants, comprehensively describes perceived benefits of a blended learning approach. These benefits include relative ease of use of the technology; availability and accessibility of learning and teaching materials; achievement of certain learning and teaching goals; enhancement of learning strategies and learners' self-organisation; increase of learners' autonomy and independence; inspirational nature of the learning content and growth of learners' motivation (p. 198). Indeed, these authors suggest that blended learning allowed students to learn how to learn (Andrejeva & Ostroverkhaia, 2017, p. 198).

The previously mentioned research studies by Ng & Nicholas (2007, 2010), Baldus et al. (2009), Thomson (2010) and Swan et al. (2015), which were undertaken over an eight-year period across two countries and three settings for virtual learning for secondary school students, all mention similar outcomes and cautions including development of 21st-century skills such as collaboration, communication and

creative thinking within students; the need for a local school facilitator to ensure students remain on-task; and the benefit of optional extra curriculum offerings made possible by the virtual learning opportunity. Whilst all these authors describe benefits for the students in the studies, the studies do not describe a situation similar to the VSSSP in this research where gifted secondary school students in rural, regional or remote areas *replace* their local bricks-and-mortar school subject offerings with an online offering that combines students with like-minds and a more homogeneous academic ability than in the regular mixed-ability classroom. There is need to closely investigate this situation in addition to the role technology may have played in achieving any perceived benefits. As well, there is need to look more closely at the potential negative impact of technology-enhanced learning, as suggested by Pyryt (2009).

### **2.3.4 Frameworks for Research into Technology Use in Gifted Education**

In the quest to define a common framework for investigating the effectiveness of technology in education for gifted students, several models are worthy of mention. The Five P Model suggested by Pyryt (2009) recommends analysis under five sub-headings: pace of learning; higher-order process skill development; opportunity to pursue areas of passion; product development; and interaction with intellectual peers. This model suggests how technology can assist to provide appropriate education of gifted students in a regular classroom, focussing on enrichment. The areas of focus include appropriate pace of learning, collaboration with similar-ability peers, transformative products as the end result of investigation, opportunities to pursue personal areas of passionate interest and altering the process of learning to be far more student-centred than teacher-centred. Whilst these are

excellent areas for consideration and could be implemented in any classroom, this model alone was not suitable to investigate the virtual provision in this case study due to the focus on enrichment rather than on core work.

Eriksson (2012) suggested a six P model which examines how technology may impact education for gifted students in the areas of personal power over learning, personal interest in technology, the places where learning may take place, the practices that may be enabled which may then influence the productivity of gifted students leading to the projection of gifted students into unknown, or innovative learning spaces (pp. 13-16). This model holds some interesting and thought provoking material that could help to form a model for this study.

Another model, the Enable, Enhance, Transform model suggested by Chen, Dai and Zhou (2013) recommends that effectiveness be measured by analysis of how technology enables educational service for gifted learners, how it enhances the quality of education for gifted learners and how it can transform gifted education by providing new directions and possibilities.

The model describes in detail three ways that technology can make a difference to educating gifted students. These ways include enabling technology to expand educational services to the gifted, enhancing the quality of gifted education offerings and transforming educational opportunities for gifted students by creating new directions and possibilities (Chen et al., 2013, p. 166). Whilst the description is comprehensive and the suggestions made are excellent, this framework alone does not provide the means to investigate the particular virtual provision in this case study. The focus in the study conducted by Chen et al. (2013) was on the role of technology rather than the mix of technology and human pursuit. The other limitation

for using this framework alone is that it focused on enrichment rather than on a whole school program.

A fourth model considered, but one that relates to teachers rather than students, is that put forward by Manwaring (2013) who investigated how early-career teachers in rural, regional and remote areas of western NSW could be supported by creation of virtual faculties made up of a number of early-career teachers linked with an experienced Head Teacher or faculty leader who was at a distant geographical location. Manwaring states that “induction and mentoring is more difficult in rural and remote secondary schools as there may be only one or two subject teachers in each school and they are more likely to be inexperienced” (Manwaring, 2013, p. 4). One of the factors experienced by schools in rural, regional and remote parts of Australia, as mentioned above, is that of attracting and retaining qualified teachers.

Manwaring (2013) describes a comprehensive method by which to analyse staff extended responses to surveys. These surveys were conducted to assess the perceived value by staff who were supported by a senior staff member (Head Teacher or Faculty Head) located at another school. The sub-themes identified in Manwaring’s analysis included the perceived value regarding subject content knowledge; improved instructional practice; assessment and feedback to students; the enthusiasm and engagement of the teacher; and the transfer of teaching materials and teacher skill-set to the local school of the early-career teacher. Limitations for using this method in this research include that the study investigated staff only.

### **2.3.5 Summary of Section 2.3**

This section has considered available research into technology use in education of gifted secondary students. It has also considered several existing frameworks for interrogation of the effectiveness of technology use in educating

gifted students. Much of the existing research has considered technology use for enrichment purposes rather than instruction for mainstream curriculum. As well, many available sample sizes have been small.

Two existing models for evaluating the effectiveness of online instruction for gifted secondary students have been explored and a third evaluation model for virtual support for early-career teachers has been considered. Each of the models described in this section offers some valuable contribution to development of a model that will suit this case study.

## **2.4 Teachers of Gifted Students**

### **2.4.1 Quality Teaching and Teachers of the Gifted**

As it is not the aim of this research to expand on quality teaching, this section will briefly look at current understandings and research at the intersection of quality teaching and teachers of gifted students.

Several studies have investigated the desirable characteristics of teachers of gifted students as seen by the students themselves. Bramwell, Reilly, Lilly, Kronish, and Chennabathni (2011) in their meta-analysis of over 15 case studies attest that personal characteristics of successful teachers of gifted students include intrinsic motivation, hard work ethic, passion for their work, risk-taking and valuing intellectual pursuit. Chan (2011) conducted research with gifted Chinese youth and reported that the 39 desirable teacher characteristics identified by the students could be grouped into four orientations of individuality, change, regulated work and achievement. Vialle and Tischler (2009), in their survey of 592 students from Years 7 to 12 in Australia, Austria and the USA, found that gifted students preferred teachers who had some personality, could communicate well, knew their subject matter and were kind.

Quality teaching has been a focus of the NSW DEC for more than 15 years. The paper *Quality teaching in NSW public schools: A discussion paper* (NSW DET, 2003) was developed into a long-term strategy that has been used to guide the development of quality teaching across all government schools in NSW since the discussion paper was released. The model has three main dimensions: a quality learning environment, intellectual quality and significance (NSW DET, 2003, p. 8). The paper reports that all three dimensions need to be equally present for quality teaching to occur. In a selective secondary school provision, intellectual quality includes class work that is either challenging enough or differentiated to suit the learning needs of gifted students (Gross et al., 2004; VanTassel-Baska, 1993).

A more recent approach to describe high-quality teaching is the concept of TPACK as described by Bower (2017). TPACK is an acronym for Technological Pedagogical and Content Knowledge (<http://www.tpack.org>). This framework describes the intersection of technology, pedagogy and subject content as a “dynamic and flexible body of knowledge” (Bower, 2017, p. 18) that requires constant attention in all areas for teachers to remain skilled in a contemporary setting where technology and practice change regularly. An integrated understanding of technology, pedagogy and content knowledge underpins effective teacher practice where effective teachers command a body of knowledge about their subject area, can communicate this knowledge to students or guide them through inquiry learning to build their own knowledge, and can harness the potential of technology to enhance learning (Bower, 2017).

Many authors have investigated the impact of the teacher on student achievement. Hattie (2003, 2009) has made particular mention of the value of a quality teacher and value-added research has confirmed that teachers can produce a

strong cumulative effect on student achievement (Wright, Horn & Sanders, 1997): “It is what teachers know, do, and care about which is very powerful in this learning equation” (Hattie 2003, p. 2). The NSW DEC has continued to focus on developing and maintaining quality teachers with their current *Quality Teaching, Successful Students* initiative (NSW DEC, 2015). This initiative lists seven factors that have been shown by robust research to have a positive impact on student learning. They include high expectations of students by teachers, explicit teaching of content and what students need to do to achieve mastery, effective feedback to students about their work, the use of data to inform practice, positive classroom management to promote positive wellbeing of students and teachers, and regular collaboration between students and between teachers (NSW DEC, 2015). Hattie (2009) in his meta-analysis of over 800 research articles found that high expectations of students by teachers, was closely linked to high performance by students. As well, Hattie (2003) described the positive impact of high-quality explicit feedback to students by teachers, about their work. The effect size of quality feedback was reported to be 1.13 with the teacher shown to be important in 21 of the top 33 sources of influence on student achievement (Hattie 2003, p. 4). Further, Kronborg and Plunkett (2012, p. 34) assert that “the role of the teacher of the gifted goes beyond the role of a mainstream teacher and that more than any other resource, investments in well qualified teachers are more highly correlated with improvements in student achievement”. It could be argued that this is true of teachers of all students, not only gifted students.

Greater student learning gains have been seen as a result of explicit teaching practices. When students have a very clear understanding of what they are required to learn and to what level of mastery, greater gains are seen: “Explicit teaching of content, explicit quality criteria and clear directions for what is expected to be done form a major part of quality teaching” (NSW DEC 2015, p. 8).



## **2.4.2 Teacher Education about Educating Gifted**

### **Students**

As described in the background and context section (Sections 1.1–1.5), teachers in the virtual provision in this case study were provided with professional learning in the personal characteristics and educational needs of gifted students. This preparation addressed teacher attitudes and possible misconceptions about gifted students (Schmitt & Goebel, 2015). A large body of research supports the need to educate teachers of gifted students about the specific nature and needs of these students. For example, works by Geake and Gross (2008) and Kronborg and Plunkett (2012) describe the positive impact on teacher attitudes to gifted students when such learning has been undertaken. Attitudes move from a negative position of suspicion or wariness, to a more positive position of understanding and appreciation. The work of Gagné and Nadeau (1991) provided data for a measure of the change in teacher attitude after professional learning had taken place. This work was used by Troxclair (2013) to explore the development of a positive attitude to gifted students by teachers in a small, rural university in the USA. The research found that some 22 years after it was first published, the Gagné and Nadeau questionnaire was just as accurate at identifying misunderstandings and negative attitudes towards gifted students in pre-service teachers with no training in gifted education.

With teachers educated about working with gifted students, a positive school culture towards gifted students may develop. Culture is self-sustaining patterns of behaving, thinking, feeling and believing, and “culture eats strategy for breakfast” (O’Donnell, 2008, p. 69). By educating teachers about gifted students’ educational, social and emotional needs there is an opportunity to influence the very values of the teachers. Values are how people believe things ought to be and they are at the centre of

building culture. Values are manifested through symbols, rituals and icons (Hofstede, 1997). People tend to absorb the culture as they interact with others and take part in day-to-day school life (Dinham, 2008). Teachers who are informed about gifted students are more likely to develop values and a school culture that is supportive of the educational, emotional and social needs of gifted students (Kronborg & Plunkett, 2012).

### **2.4.3 Summary of Section 2.4**

This section described research available to support the importance of good quality teachers and the need for teachers of gifted students to be educated in the characteristics and social/emotional needs of gifted students in order to meet their educational needs well. Research that has uncovered gifted students' perception of what makes an effective teacher have been shared. This section also considered the role of school culture in supporting gifted students.

## **2.5 Other Factors**

Several other factors that could have a place in this research were uncovered through wide reading of the literature. This section will expand on those factors which include creativity, 21st-century skills and, learning and the nature of the individual.

### **2.5.1 Creativity**

Within research into creativity there is some conjecture around whether or not the word should have a capital letter. 'Big C' creativity, or creativity of an eminent nature such as the work of Einstein, has been compared with 'little c' creativity, or a more commonplace variety of creativity (Merrotsy, 2013; Zazkis, 2017) which is then further expanded to describe 'mini c' creativity or creativity of a personal nature to construct knowledge and understanding (Merrotsy, 2013). For the purposes of this research, mini c creativity will be used, that is, creativity of an innovative, personal

nature. Little c creativity may grow into Big C creativity: “Big C creativity involves things that lead to social recognition, but the creativity results from the same process that is involved in little c creativity” (Runco, 2014 p. 132).

The creativity of gifted individuals is well described. Holmes (1989) describes the creative work habits of scientifically and mathematically gifted individuals. These work habits include “working over sustained periods to accumulate an apparently unrelated quantum of facts which they then use logic to link together in ways not seen before” (Holmes, 1989, p. 55). Beghetto and Kaufman (2009) refer to research that demonstrates empirical links between creativity and academic achievement. These authors assert that “learning as a cumulative model, rather than as an interpretive model, falls short in explaining how gifted students make meaning from materials they have learned” (Beghetto & Kaufman, 2009, p. 300). Gifted students do learn at a faster pace and may be able to retain large amounts of information but it is the use of this accumulated information in new and original or creative, ways that sets gifted learners apart from other learners (Beghetto & Kaufman, 2009). This constructivist view of learning as opposed to an accumulative view suggests that learning is not just memorising and reciting but requires quite a bit of imagination (Beghetto & Kaufman, 2009). Beghetto (2006) reports that students with higher levels of creative self-efficacy were significantly more likely to hold more positive beliefs about their academic abilities in all subject areas and were more likely to report higher levels of participation in after-school group activities.

In an age of wonder (Tan, 2015), creativity is described as a new priority in schooling: “the building of young people’s creative capacities should be additional to their basic literacies, as creativity is the value-adding component to an individual’s

capabilities and the economy more generally” (Kimber & Wyatt-Smith, 2010, p. 610). Further discussion by these authors on the links between creativity and critical engagement leads to discourse on the possibilities of multimodal assessment strategies to develop skills in accessing and using different mediums to better reflect the current digital learning environment. This view is supported by research from Ireland where Farren and Crotty (2014) describe the positive impact that multimodal assessment methods have on student engagement and learning at a tertiary level.

Creativity is reported to be innate, but it still needs to be cultivated and nurtured (Tan, 2015). With the knowledge economy booming and showing no signs of slowing down, a certain complexity of life is now common, suggesting there is a need for creativity now as there has never been before (Runco, 2004). Creativity is sometimes described as “the development of original ideas that are influential or useful” (Runco 2004, p. 658). Because of its role in entrepreneurship and innovation, creativity has become of great interest within business and organisational areas. Future-focused learning, or learning for a future workplace that is as yet unknown (Richter, 2009), will require creativity, flexibility and adaptability (Australian Council of Deans of Education, 2001). Creative individuals adapt to change and manage with the resources they have on hand; they have the capacity for sustained concentration or focus (Csikszentmihalyi, 1996).

Creative teachers have a place in this discourse on creativity as Section 2.4.1 described the importance of quality teaching and the impact of the teacher on gifted students. A comprehensive meta-analysis of over 13 case studies and two quantitative studies of teachers by Bramwell, Reilly, Lilly, Kronish and Chennabathni (2011) concluded that creative teachers were “hard working, persistent, passionate, risk-takers who valued intellectual activity” (p. 235). The

interpersonal values of creative teachers described as being important to the students they taught were their self-direction, universalism and stimulation (Bramwell et al., 2011). As well, the importance of building a collaborative, cooperative community of creative individuals was shown to best support creativity in individuals. Promoting creativity in schools and embedding it into the school culture requires the development of self-motivation, confidence, curiosity, and flexibility (Tan, 2015).

Chan (2011) reports that skills in creativity and problem solving rated an average 4.2 out of a possible 5 with standard deviation 0.96, for gifted student perceptions of the desirable qualities of teachers. (p. 163). While a standard deviation of 0.96 is high and indicates a wide spread of results from the reported average, this was the highest average score and the lowest standard deviation for all characteristics reported in Chan's work, indicating the importance gifted students placed on creativity in relation to their teachers. Teachers of gifted students are widely described as having a large impact on the development and learning progress of gifted students (Chan, 2011).

In their study on the professional capacity of a group of early-career mathematics teachers in Germany to foster the creativity of high-ability students, Hoth, Kaiser, Busse, Döhrmann, König and Blömeke (2017) found that teachers who have difficulties in logical reasoning and understanding structural aspects of mathematics also have difficulties in identifying and supporting creative and high-achieving students (p. 115). The study by Hoth et al. (2017) postulates that there is a measurable connection between mathematics teachers' content knowledge and their ability to identify and support creative and high-achieving students with the results indicating that "teachers need profound content knowledge in order to identify complex and creative students' solutions" (p. 116). This claim is supported by the

work of Bower (2017) who reports on the intersection of technological knowledge, content knowledge and pedagogical knowledge as being indicative of high-quality teachers.

### **2.5.2 21st-Century Skills**

A report on the progress of the Connected Classrooms Program (NSW DEC, 2010b) described the need for 21st-century techniques to develop graduates who will be employed in a 21st-century workplace (p. 9). Wagner (2014) states that all students will need skills to succeed in a knowledge economy and while the term “21st-century learning” is contested, the Australian Council for Deans of Education offers the following relevant description:

Learning in the 21st-century will be general in its focus, rather than specialised on the particular needs of the day. It will be about creating a kind of person, with kinds of dispositions and orientations to the world, rather than simply commanding a body of knowledge. These persons will be able to navigate change and diversity, learn as they go, solve problems, collaborate, and be flexible and creative (Australian Council of Deans of Education, 2001).

This statement reflects a sentiment that is highly regarded by many, yet the research into whether these attributes can be seen in secondary school graduates remains scant some 17 years after the drafting of these ideas.

The term “21st-century skills” refers to a broad set of knowledge, skills, work habits, and character traits that are believed to be critically important to success in today’s world. These skills include:

- critical thinking and problem-solving
- collaboration and leadership

- agility and adaptability
- initiative and entrepreneurialism
- effective oral and written communication
- accessing and analysing information
- curiosity and imagination

(Saavedra & Opfer, 2012, p. 8).

Technology is generally acknowledged as being of major importance in assisting the development of these skills by “providing them [students] with new ways to develop their problem solving, critical thinking, and communication skills. Technology can help students practice transferring those skills to different contexts, reflect on their thinking and that of their peers, practice addressing their misunderstandings, and collaborate with peers” (Saavedra & Opfer, 2012, p. 9). Outdated models of teaching and learning where the teacher simply transmits factual knowledge to students are not helpful to the development of skills for the 21st-century workplace (OECD, 2009). There is evidence to suggest that students who are disengaged through this outdated method of learning, and who choose to show their disengagement by behaving in a disruptive manner, can reduce effective class time by up to 30% (OECD, 2009).

Successful 21st-century learning that enhances development of the 21st-century skills listed above includes practices such as making the curriculum relevant to the lives of students, teaching through the discipline not just learning the facts of the discipline, encouraging deep thinking and the transfer of skills/ knowledge to new contexts, fostering creativity, treating teamwork like it is an outcome, addressing misunderstandings directly, capitalising on the use of technology to enhance learning and teaching students how to learn (Saavedra & Opfer, 2012, p.

11). If 21st-century learning needs to change, then arguably so does 21st-century assessment (Farren & Crotty, 2014; Griffin & Care, 2015). This could be as simple as submitting works in a digital manner or using a more holistic measure for success as suggested by Hunt and Merrotsy (2010) where all activities undertaken are valued. This includes activities such as service learning, cultural pursuits or representative sport at a very high level (p. 43). Other formative assessment practices such as questioning using automatic response systems (Mahon, Lyng, Crotty & Farren, 2018), could also form part of a more contemporary assessment suite.

### **2.5.3 Learning and the Nature of the Individual**

The general nature of gifted and talented students is described in Section 2.1.1. Gagné (2003, 2008) describes students as having the capacity to be gifted in more than one domain, for example intellectual giftedness in addition to physical giftedness. Gagné's model offers a possible explanation for why gifted students often seem to be involved in many extra-curricular activities in an effort to cater for all their interests and abilities. A student capable of performing on the sporting field to a high level, mastering a musical instrument to a high level and completing academic work to a high level, may well aim to achieve all this simultaneously. Gross, MacLeod, Drummond and Merrick (2001) in addition to Sriraman and Dahl (2009) describe the aptitude for gifted students to work independently and in a multimodal capacity including across curriculum areas. The authors also describe the propensity for a long attention span as a positive outcome, in addition to the capacity to work with little direction; and anger at being disrupted as a negative outcome (Gross et al., 2001).

Dweck (2009) asks the question about who learners in the 21st-century will be. Perhaps a more salient question is to ask who the *successful* 21st-century learners



will be. Dweck's research suggests that successful 21st-century learners will have the right proficiencies to explore a topic further, have the disposition to be able to engage in higher order critical and creative thinking, have high levels of self-accountability, and be able to recognise their own strengths and weaknesses over time (Dweck, 2009, p. 8). To achieve this result, learners need to have a growth mindset, or a belief system which lets them acknowledge that with effort they can manage to develop knowledge and skills (Dweck, 2008). Dweck argues that successful learning for anyone is the belief that it can be done and a willingness to try. This research is supported by similar findings reported by Deakin Crick (2007) where:

the creation of interdependent communities of intentional learners provides a basis for the integration of traditional academic skills and outcomes with the learning dispositions, values and attitudes necessary to meet the demands of the emerging networked society. There is an urgent need for our education system to foster flexible, creative, self-aware and dynamic learners who have the capacity to apply and adapt what is learned to their own lives, embedded in their local and global communities, and who can extend their learning and understanding into spheres of thought and action which demand intelligent behaviour in the real world (Deakin Crick, 2007, p. 137).

Some may argue that gifted students, with their apparent high natural intelligence, are just the right students to learn in this 21st-century manner; however, inherent motivation or volition may be a prerequisite (Gagné, 2010). Motivation or "that complex mixture of desires, needs, goals, dedication, effort, and will-power" (Gagné, 2010, p. 86) manifests as a major intrapersonal catalyst. Motivation may underpin student engagement in learning. It may be influenced by parental input such as providing an environment at home where autonomy and competence are actively

supported by parents (Garn, Matthews & Jolly, 2012), which may in turn lead to development of intrinsic motivation or self-regulation. Intrinsic motivation is where internal regulations, “such as personal interest, enjoyment, satisfaction, and curiosity, activate and govern behaviours. The rewards of engaging in behaviour are not tangible; rather, they are related to the feelings of internal pleasure experienced during engagement” (Garn et al., 2012, p. 657). When a student is intrinsically motivated, the reward for completing a task is the process of doing the task itself. Extrinsic motivation on the other hand, is where an outside or extrinsic reward is required for the student to be motivated to complete a task. For example, some students will become very engaged in a task only where there is a reward such as a merit certificate or academic prize. Achievement outcomes are more readily attained if the student is highly engaged in the learning process, rather than for an external reward at the end of the process (Garn et al., 2012).

Learning how to learn is a complex phenomenon and one that is the focus of more and more research. Learning how to learn is associated closely with student engagement and student engagement is closely associated with positive self-identity (Deakin Crick & Goldspink, 2014). Learning how to learn requires “practices which invoke the need for the learner to take responsibility for their own learning, and to do this in a way that involves peers. This requires students to be motivated to learn, and to be intentional, to be aware of themselves and others as learners, and to regulate their own learning” (Deakin Crick, 2007, p. 137). Intentional learning is sometimes described as autonomous learning.

In a factor analysis of 2000 learners, Deakin Crick (2007, p. 138) identified four broad categories which appeared to be relevant to learning how to learn. These were “learning capacities such as dispositions, awareness and skills; learning identity

which includes the beliefs, values and attitudes about learning, self and knowledge held by the learner; learning story or the sociocultural formation of learners over time; and learning relationships which speak to the quality and substance of learning relationships”. These categories appear to influence how students learn to learn.

In a study of more than 2500 secondary school students in Spain, Fernandez-Rio, Cecchini, Mendez-Gimenez, Mendez-Alonso and Prieto (2017) found that self-regulation was highly influential in relation to students’ academic self-efficacy. In particular this research suggests that “since students high on self-regulated learning have been found to be more proactive, they tend to show initiative, persistence and adaptive skills, originating from positive metacognitive and motivational skills” (p. 6). Further, Fernandez-Rio et al. (2017) suggest that learning contexts that promote self-regulation imply choice and consistency, teacher enthusiasm, humour, fairness, and teacher expectations about students’ capacity. The intersection and interrelation of high teacher expectations (Hattie, 2009) appear then to contribute to the development of self-regulation in students.

Perfectionist tendencies are sometimes prevalent in gifted students (Silverman, 2007) and these need to be addressed in order to maintain good mental health. One suggestion is an environment of personal best, rather than the best. The personal best approach aligns with contemporary research by Martin and Elliot (2016) whose longitudinal study of over 1100 high school students found that when students were encouraged to do their personal best, aiming for academic growth compared to their last achievement, rather than comparing their achievement to others in the cohort, positive academic progress and engagement followed (p. 1300).

Sandra Kaplan has worked in the field of differentiation in gifted education since the 1980s and her 2017 paper on student self-directed differentiation offers a

unique insight into the need for gifted students to be proactive about differentiating their own learning experiences in addition to teacher-provided experiences (Kaplan, 2017). Kaplan recommends that in order for gifted students to build the skills they need for self-directed differentiation, they need to be immersed in learning to learn skills/experiences by their teacher. These skills include the opportunity to practise the art of discriminating what section or facet is needed to be practised so as to maximise the value of practice and minimise its negative effects; the opportunity to learn about transfer of skills and knowledge as the need to apply what is learned in one setting to other settings is primary to becoming a scholar; the capacity to prioritise; the capacity to extrapolate what is essential and subsequently how to communicate what has been learned; and finally the capacity to connect and associate as “the art of making connections is aligned to the art of elaborating ideas and skills and corresponds to the potential outcome of exercising creativity and developing a personal academic identity” (Kaplan, 2017, p. 110). Self-directed differentiation may enable the gifted learner to continue differentiating for and by themselves in all learning situations; the teacher still plays a vital role in differentiation of learning materials but also builds a skill-set within students that allows for more independent learning.

A meta-analysis of 25 years of research, published by Friedman-Nimz and Skyba (2009) postulates that several non-intellectual factors may help or hinder gifted individuals and might have an impact on talent development. These factors include self-perception, motivations, resilience and unresolved problems such as perfectionism (p. 425). Resilience is described by Kitano and Lewis (as cited in Friedman-Nimz & Skyba, 2009) as effective coping characterised by flexibility and change. Bland, Sowa and Callahan (as cited in Friedman-Nimz & Skyba, 2009) refer

to resilience as increased emotional strength and hardiness. Bland et al. suggest that resourcefulness, optimism, self-efficacy and self-reliance are distinguishing features associated with positive functioning and are developed through, among other things, a good fit between the classroom and the child.

#### **2.5.4 Summary of Section 2.5**

This section considered extant research to support investigation of the role of creativity in students as well as in teachers of the gifted and the need to develop 21st-century skills for a workplace that does not yet exist. As well, the nature of the learner and its impact on achievement has been explored. The nature of the learner is an area that has been widely researched in the general population but there is room for more research in relation to gifted students specifically.

### **2.6 The Case for this Research to be Undertaken**

Anecdotally parents, students and staff felt the VSSSP in this case study was a success in meeting the educational needs of gifted students in rural and regional areas. Sections 2.1 through to 2.5 have discussed several themes of interest when considering how this apparent success might be supported or challenged by rigorous research. There is scant research globally on whether there is a particular type of student who not only does well, but who thrives in a virtual learning environment. Similarly, there is scant research investigating what it is about a particular gifted education strategy that makes it work; even less research about effective technology use in successful education of gifted and talented school students. Perhaps the largest gap in current knowledge is the combination of research into using technology for successful education of gifted students in rural, regional and remote locations and the pedagogies that may support this.

By investigating themes that have emerged throughout the literature review and taking into account observations, experiences and perspectives of the staff, students and parents throughout the operational years of the VSSSP, there is an opportunity to extend current knowledge into what works for technology-enabled education of gifted students in rural, regional and remote locations. Data from standardised external tests of achievement may add an external perspective to serve as orientation and context for the personal perspectives.

In the literature search undertaken, there was no information found that described research into a program for gifted secondary school students in either a metropolitan or rural, regional and remote area, where regular curriculum has been *replaced*, and the new curriculum delivered in an online environment. This significant gap in the research needs to be addressed, and as such this research could be the first of its kind globally.

## **2.7 Research Question**

The case study of the VSSSP will use mixed methods to elicit an answer to the research question “In what ways, if any, was the VSSSP valued in terms of meeting the educational and affective needs of gifted secondary school students in rural, regional and remote areas?” Sub-questions that will help describe any transferable value, or not, of the provision include:

1. In what ways, if any, did the VSSSP support the learning and teaching of gifted and talented students located in rural, regional and remote secondary schools in NSW?
2. In what ways, if any, did being involved with the VSSSP support the students and staff with their mainstream classes?

3. In what other ways, if any, did being involved with the VSSSP develop the student or staff member?

Perhaps the most salient reason to undertake this research is expressed by Jolly and Kettler (2008, p. 441): “if gifted education is to improve, the research base must shift from describing the phenomena of giftedness to identifying and verifying best practices for gifted education”.

## **Summary of Chapter 2**

This chapter has reported and critiqued extant research into areas related to the case study. The nature and characteristics of gifted students have been described, the current state of education in rural, regional and remote areas and the use of technology in education have been explored. Quality teaching and teachers of the gifted have been investigated and other related research areas such as creativity, 21st-century learning including desirable graduate attributes, and the nature of the learner have been considered. Existing frameworks to study the use of technology in gifted education have been considered. Chapter 3 will describe the research method and the framework for investigating the VSSSP in this research study. The chapter will be broken into two sections with the first section describing research methodology and the second section, the research methods used in this study.

## Chapter 3: Methodology and Method

This chapter will describe research methodology in general in Section 3.1, then the research method used in this study in Section 3.2. When deciding to conduct any research a raft of decisions need to be carefully considered if the research findings are to be trusted. Research that is not carefully and deliberately planned may have an inbuilt bias or some other design fault, which could lead to inaccurate research findings.

The purpose of this research was to investigate the perceived value, as seen by the student participants, and their parents and teachers, of the Virtual Selective Secondary School Provision (VSSSP) that operated in Western NSW Region (WNSWR), Australia, for a five-year period from 2010 to 2014. The background and context of this research, described in Chapter 1, were an important influence on the research methodology. My insider researcher status (Smales, 2002) had to be considered as well as my incumbent position as a senior executive of the school at the time. Any possible Hawthorne effect (Neuman, 2011) had to be mitigated or removed completely if possible. Nevertheless, there could be a benefit to being an insider researcher as rich descriptions may be provided that could not be understood in the first instance by an outsider (Smales, 2002).

This chapter has two sections. The first section will expand upon methodology, or the principles underlying particular research approaches, and strategies of inquiry relevant to each methodology. The combination of philosophical principles and strategies of inquiry gives different research designs and a number of them relevant to educational research are described. Factors relevant to all research including validity, reliability, triangulation, and ethical issues, are discussed as well as sample size and sampling method. In the second part of the chapter, factors



relevant to this research study are presented including the methods used in the research design, permission to conduct the study, sample size and a description of the different participant groups, data-gathering instruments, administration of data-gathering instruments and data analysis. The study aimed to find a response to the research question “In what ways, if any, was the VSSSP valued in terms of meeting the educational and affective needs of gifted secondary school students in rural and remote areas?”.

### **3.1 Methodology**

Methodology refers to the “principles underlying particular research approaches, as distinct from methods which are ways of collecting data for analysis” (Liamputtong, 2009, p. 3). Creswell (2009) in his seminal book on research design refers to three approaches to research: qualitative; quantitative; and mixed methods (p. 4). Before the choice can be made about which of these approaches might be suitable, a researcher needs to consider several design components. Each of these components will be considered in turn in the following paragraphs.

#### **3.1.1 Research Design in general**

This section will describe some of the various choices a researcher needs to consider in any research.

The first component of design to consider is the philosophical assumptions and worldview of the researcher. This worldview will be “shaped by the researcher, the beliefs of their advisors or supervisors and any past research experiences” (Creswell, 2009, p. 6). Following the scientific revolution, early research was empirical, using quantitative methods. The process was methodical and logical and followed scientific research principles: define a problem, state the hypothesis to be tested, collect and analyse data then interpret the results and draw conclusions about

the problem (McMillan & Schumacher, 1989). This process meant aiming to capture only data that could be observed first-hand and measured with strict objectivity, to the exclusion of all other data. This positivist approach may work well in a laboratory experiment but is not flexible enough to interpret the interaction of an individual with their environment, as there is no consideration of the “how” or “why” a particular event was able to be observed and measured. A positivist approach means accepting that there is only one version of the truth, and that is the version which aligns with universal laws and theories that can be tested against a hypothesis (Flick, 2009). This approach fails to acknowledge that education research is a process of inquiry about human activity and as such “involves hopes, values and unresolved questions about social affairs” (Popkewitz, 1984, p. 1). A slightly more flexible post-positivist approach developed after the positivist approach, where it was acknowledged that there could be more than one version of the truth, and the truth depends at least in part on the perspective of the research participant and their previous experiences. If an educational research participant had say, a previous unsavoury experience in a classroom, this experience may affect the manner in which they respond to questions. This belief, where causes probably determine effects or outcomes, aims to test and refine laws and theories. Postpositive worldview research seeks to develop relevant true statements that describe the causal relationship of interest through a more nuanced lens.

A second worldview postulated by Creswell (2009) sees reality as socially constructed. Social constructivist researchers hold assumptions that individuals seek understanding of the world in which they live and work (p. 8) that may be different from the assumptions of individuals in other contexts. To this end the goal of the researcher is to rely upon the participants’ views of the situation being studied and to

embrace the complexity of these views. Social constructivist researchers seek to understand the natural setting of the participants (usually by visiting this setting to undertake the research) and interpret findings based on the researcher's own experiences and background. The researcher generates meaning from data collected in the field, using primarily qualitative (descriptive) rather than quantitative (numerical) methods.

An advocacy or participatory worldview (Creswell 2009, p. 9) takes the concept of postpositive assumptions and alters them to include politics and an agenda that will advocate for marginalised groups. This worldview suggests that the purpose of research is not to uncover "truths" or to richly describe particular contexts, but to advocate for the needs of these marginalised or disenfranchised groups, who may be included in the research process as active collaborators and in doing so provide a voice for these groups. Theoretical perspectives may be combined with philosophical assumptions that guide the research design, to build a picture of what is being examined. This picture may be used to provide a rationale for changing social and economic conditions or to give rise to alternative social arrangements (Popkewitz, 1984). In this type of educational research, advocacy must be declared at the outset in order for the findings to be considered plausible. A lack of transparency would be of concern.

The final philosophical worldview postulated by Creswell (2009) is that of the pragmatist where the worldview arises out of actions, situations and consequences. Pragmatism is concerned with what works and solutions to problems, and a researcher who holds these assumptions will use all approaches available to understand a problem. Pragmatists are not committed to any one philosophy but agree that social, historical, political and other contexts all play an important role in

the development of a worldview and to understand a research problem, all options need to be used. A mixed methods approach to research, where qualitative and quantitative data are combined to reach a conclusion, is an example of a pragmatic approach.

Once a worldview and set of guiding assumptions has been established by the researcher for the context/problem they wish to investigate, strategies of inquiry need to be considered. Strategies of inquiry will provide specific direction for the procedures that will be used within the research design. Quantitative strategies include surveys and experimental research where a set of numbers will be generated that might be analysed to make meaning (Creswell, 2009). Surveys aim to gather data from a sample of the population whilst experiments often involve applying a treatment or intervention to one part of the population whilst withholding it from another part of the population, then comparing the outcome from both groups (Flick, 2009). The aim is to try to demonstrate, for example, the success or otherwise of an educational intervention and to derive knowledge that might then be applied in other contexts.

In education and other social research, qualitative strategies may be employed instead of quantitative strategies in order to capture and describe the worldview of the participants. Qualitative inquiry strategies include approaches such as ethnographic study of a population in situ; case study where the researcher explores a program, activity or individual in depth; inquiry of a phenomenon as experienced by those who are, or were, part of it; narrative research where the researcher records stories from the lives of individuals; and grounded theory where the researcher derives a general theory of a process or interaction which is grounded in the views of participants (Creswell, 2009). All such strategies aim to generate understanding of

something that is context-specific rather than something that is universally true. A more detailed description of these qualitative approaches is provided in Section 3.1.2.

The final strategy of inquiry suggested and described by Creswell (2009) is mixed method inquiry. In this strategy of inquiry both qualitative and quantitative strategies are applied in an effort to address the limitations of both strategies and provide data from different sources about the same thing. Quantitative approaches may be too strict in their approach and as such may provide an answer to a research question that is too simplistic and that does not provide enough about the “how” and “why” of an observed result. Qualitative approaches are not trusted by some as there is opportunity for the researcher to intentionally or unintentionally embed a bias to the research design or analysis of data such that the findings are not entirely accurate (Popkewitz, 1984).

Quantitative methods indicate areas of interest or significance while qualitative methods provide rich detail about those areas. Mixed method inquiry may be sequential, where the researcher aims to elaborate or expand on the findings of one method with the findings of another method conducted at a separate time; concurrent where the researcher aims to merge qualitative and quantitative data collection in order to provide comprehensive analysis of the research problem; or transformative where the researcher uses a theoretical lens which would orientate the study in an overarching manner in order to report findings from qualitative and quantitative data that might be used to make changes in the setting that is being investigated, such as might be found in advocacy research.

The last step in the research design process, once worldview and method of inquiry have been decided is to decide how to conduct the research. These decisions

will determine the data-collection methods, and analysis and interpretation, which will form the basis of sense-making of the information gathered. In this last step the intended audience of the findings may be taken into consideration as the research design needs to be palatable and informative for that audience. The function of educational research after all, is to advance knowledge and improve practice (McMillan & Schumacher, 1989).

### **3.1.2 Types of Educational Research - general**

Educational research is designed to reduce potential sources of error in reasoning about the educational world. Educational contexts are part of the social world, not the natural world, which means that quantitative investigations to uncover universal truths are not usually appropriate. However, “Educational research builds on the methods of science, so it relies on logical and systematic methods to answer questions” (Check & Schutt, 2012, p. 10). Science research methods include logical, systematic documentation and investigation of nature and natural processes; potentially, new knowledge is produced by these investigations. Education research uses these same logical, systematic methods to investigate learning and teaching. It follows then, that these same investigative processes have the potential to produce new knowledge in the field of education provided the process is treated as scientifically – that is, as systematically and logically – as possible (Check & Schutt, 2012; McMillan & Schumacher, 1989).

Data used in educational research may be collected using several different approaches that result in either quantitative or qualitative data collections. Quantitative data include data expressed as numbers which can be arranged in an order of magnitude as a means to make sense of what has been collected. This process might include a rating scale where research participants need to rate

something on an increasing scale, or it could be test scores that are arranged to show a collection of results. Collection methods for quantitative data include instruments such as surveys with a rating scale or a report of particular test results for a whole class of students. Qualitative data are data that cannot normally be expressed in number form. Such data include written or spoken words and are one way in which a researcher can capture reality as perceived by the research participants. Qualitative data-collection instruments include interviews, open-ended responses in surveys, or notes taken as a researcher observes some research participants in their natural setting (Check & Schutt, 2012). Qualitative data are not respected by all researchers as being reliable since there is opportunity for the researcher to influence results through their choices in research design. A poorly constructed set of interview questions or an undeclared cursory analysis of data is the type of influence that may lead to invalid findings (McMillan & Schumacher, 1989). In order to minimise this influence, great care needs to be exerted in order to find an approach that is as objective as it can be and reliable in its processes so that findings can be revealed, even if they do not align with the intention of the researcher.

Educational research may be descriptive, exploratory, explanatory or evaluative (Check & Schutt, 2012). Descriptive research aims to describe the scope of an observed issue or phenomenon, generally through the collection of qualitative data that allow the researcher to describe observed differences in data collected and which may be specific for that context (McMillan & Schumacher, 1989). Exploratory research aims to find out more about a particular observed phenomenon, often with the purpose of refining the parameters for follow-up studies. Explanatory research aims to identify possible causes and effects for an observed phenomenon. Evaluative educational research aims to determine the effects of policies and educational

programs using instruments such as test scores, rating scales and interviews. Check and Schutt describe evaluative research as a special type of explanatory research (2012, p. 13) that uses both quantitative and qualitative instruments to capture information. Evaluative research design is intended to gather data that will allow conclusions to be drawn about the value or impact of a particular educational initiative. “If” an educational policy has an impact, and “how” it produces these results are both evaluated. Evaluative research design needs to do more than describe the before and after of an educational intervention, which would leave the processes that took place within the intervention as a “black box” that is not considered for analysis (Check & Schutt, 2012, p. 154). Valuable evaluative research needs to open the black box of the processes that took place within the intervention, in order to make meaning. This view is reinforced by McMillan and Schumacher (1989) who describe evaluative research as critical to determine whether the practice works, in terms of the values operating at the sites (p. 20). A shortcoming of evaluative research is that the findings usually have limited generalisability but this may be countered by the manner in which evaluative research may stimulate further research suggestions. It is also a positive manner in which to add new knowledge about a particular educational practice.

### **3.1.3 Types of Educational Research - specific**

There are several different styles of educational research. These styles include ethnographic (or naturalistic) studies, archival or documentary research, cross-sectional or longitudinal studies, case studies and experiments designed to test a hypothesis.

Ethnographic research aims to describe rather than predict, be inductive rather than deductive and tries to answer three main questions: What are the



characteristics, causes and consequences of an observed phenomenon? Ethnographic research is conducted in natural settings and often produces descriptive cultural knowledge of a group (Cohen, Manion & Morrison, 2007; McMillan & Schumacher, 1989). It also allows the perception of the participants to be captured through a variety of data-collection instruments, for example surveys or interviews. It is a particularly helpful way for an Insider researcher (Smales, 2002) to research their workplace as the researcher may have been embedded in the site for a period of time and may have built trust with the intended participants. This situation brings with it some significant risks for potential bias so it is imperative that the insider researcher status is declared up front and that steps taken to mitigate or remove influence are explained in detail.

Archival or documentary research aims to establish facts and draw conclusions about past events by undertaking systematic location, evaluation and synthesis of documentary evidence. Historical research allows revaluation of hypotheses, theories and generalisations held at present, about the past (Cohen, Manion & Morrison, 2007; Yin, 2014). Often, the researcher spends considerable time locating the documents then needs to apply rigorous techniques of criticism in order to assess their reliability to ensure there has been no editorial bias (Yin, 2014) before the historical documents are included in current research.

Cross-sectional and longitudinal studies aim to gather data either in a single instance (cross section) or a series of instances (longitudinal) in order to describe the present relationship amongst variables or explain changes in these relationships over time (Cohen, Manion & Morrison, 2007, p. 205). A commonly used data-collection instrument in these types of study is the survey. Cross-sectional and longitudinal studies aim to gather large-scale data from a representative population in order to

make some generalisations about how variables relate to each other and possibly change over time. An important part of the numerical data collected through survey is that there needs to be explanation about how the numbers have been developed. For example, if the response scale was not identical in number of options and there were three options for some and five for others, these data would be flawed from the outset. Some statistical analysis must be applied to ensure that the numbers can be trusted as being representative, assuming that the numerical scale is equivalent in number of options. Preplanning the statistical analysis of quantitative data collected is an important step in the research process (Creswell, 2009).

Case study as a research type aims to describe what it is like to be in a particular situation and to generate rich descriptions of participants' lived experience, thoughts about and feelings for a particular situation and seeks to distil the "how" and "why" something works (Yin, 2014). Case studies have many strengths and a few significant weaknesses. Strengths include that case studies are strong in reality rather than theory, with the capacity to recognise and describe the embeddedness of social truth and embrace the subtlety and complexity of the case. Case studies can be deciphered by a wide range of audiences and allow readers to judge the implications of the study for themselves (Cohen, Manion & Morrison, 2007; Yin, 2014). Case study as an approach may be viewed by some as being relatively subjective as there is opportunity for the researcher to be selective in interpreting results and in making observations (Burns, 2000). This viewpoint is countered by Punch (2009) who asserts that understanding the case in its complexity and entirety is the major focus. This study utilised a case study method, as described in Section 3.2 following.

### 3.1.4 Application of Learning Theories

Qualitative research aims to uncover relative rather than absolute truths.

Qualitative researchers differ from, for example, positivists in their conceptions of the nature of knowledge (epistemology) and reality (ontology). They use subjectivist, interpretivist methods to come up with findings relevant to one context, not all contexts (McMillan & Schumacher, 1989). These methods are also described as constructivist, as researchers and research participants attempt to describe knowledge that only exists when they internalise it, constructing their own meaning and reality for it.

Constructivism also applies to learning. In this case, learners internalise whatever it is they are learning, constructing their own meaning and reality for it (McMillan & Schumacher, 1989). Constructivism is relevant in qualitative evaluative studies where participants evaluate the subject of the research based on their own experiences (as in this study). With the advent of online learning and findings that learning was improved when technology was incorporated, views about constructivist learning have developed and a new learning theory has become accepted, as described following.

There has been some research into online learning in a range of settings with some early work by Anderson and Elloumi (2004) suggesting that there was an ongoing debate about whether it was “the use of a particular delivery technology or the design of the instruction that improve[d] learning” (p. 1). At this stage, connectivism as a learning theory (where learning is created in conjunction with technology) had yet to be postulated and as such, this early work described three broad learning theories that were commonly accepted at the time (p. 7):  
behaviourism, where learning is identified by changes in behaviour;

cognitivism, where learning involves the use of memory, motivation, thinking and reflection; and constructivism, where learners actively construct their own knowledge by interpreting information in their own reality and as such learn by observation, processing, and interpretation. Anderson and Elloumi (2004) suggested the need for a theoretical framework to support the description of technology-enhanced learning and they put forward a model for e-learning. The model suggests there is significant interaction between the student and knowledge and the teacher and knowledge, with the student and teacher interaction occurring through communication in a synchronous or asynchronous manner in an online environment via material created by the teacher and retrieved by the student (p. 49). This model implied some two-way construction of knowledge through connection using emerging technologies.

Siemens (2004) suggested a new learning theory that might better describe observations in a technology-centred learning mode. Siemens (2005) and Downes (2005), kept working on the new (in 2005) learning theory of connectivism which suggested the learner is self-directed and creates knowledge collaboratively using online technologies to combine cognitive and non-cognitive aspects of learning. Importantly in this learning theory, the learning rests in a diversity of opinions which are stored in a variety of digital spaces: "Learning transpires through the use of both the cognitive and the affective domains; cognition and the emotions both contribute to the learning process in important ways" (Kop & Hill, 2008, p. 2). Connectivism stresses two important skills that contribute to learning: the ability to seek out current information and, using self-directed tendencies, the ability to filter secondary and extraneous information. Much of the research around the development of connectivism as a learning theory that seeks to explain the role of technology in

learning, used tertiary institutions and adult learners to build an argument. There is still academic debate about whether connectivism is a learning or instructional theory. Perhaps the most pragmatic approach is simply to consider how connectivism might look in the classroom (Rank, 2018). This description may, or may not, then be able to be applied to secondary school students.

After 2005, the term “connectivist” joined the academic learning theory lexicon; however there is still debate about whether it is a learning or instructional theory. Perhaps an important point to consider is the inevitable connection between learning and teaching that makes it difficult to separate the two: “Researchers of different traditions accept the idea that instruction and learning interact and are best studied in concert. Instructional research can have a profound impact on learning theories and their applications to promote student learning” (Schunk, 2012, p. 19). To this end connectivism, which relies on technology in order to be observable, is accepted as a learning theory in this research and will be used in concert with other learning theories to make meaning.

### **3.1.5 Validity, Reliability and Triangulation**

Findings in research are only as good as the data used to make these findings. Much depends on data being collected and analysed in an unbiased fashion, and collected in a manner that ensures reliability and validity of the data set (Punch, 2009). Reliability means that a measurement procedure yields consistent scores over time (Check & Schutt, 2012, p. 84), whilst validity refers to the extent to which measures indicate what they are intended to measure (Check & Schutt, 2012, p. 82).

Reliability and validity can both be examined in minute detail across the broad range of types of research in education. Two types of validation will be considered a little further: construct validation and criterion validation and two types

of reliability will be considered: external reliability and internal reliability. Construct validation in qualitative research refers to the meaning, or construct, that a researcher applies to a particular phenomenon. The researcher's construct can be based on wide reading that will support a point of view. In this way a reader can be assured that the construct being investigated is generally similar to that which is accepted (Cohen, Manion & Morrison, 2007). In quantitative research, construct validity refers to the assessment of a data-gathering instrument, such as a survey, to ensure that it measures what it is intended to measure (Liamputtong, 2009). Criterion validation is "established when the scores obtained on one measure can be accurately compared to those obtained with a more direct or already validated measure of the same phenomenon" (Check & Schutt, 2012, p. 84). Taken together, and if demonstrated in the research design, these two terms allow some confidence for the reader that the research design has actively looked for ways to define and investigate constructs in an acceptable manner that aligns with other research.

External reliability is the extent to which independent researchers could discover the same phenomena in the same or similar situation (McMillan & Schumacker, 1989) and is achieved in qualitative research by the researcher providing explicit description of five aspects of the research study. These aspects include the role of the researcher, participant selection details, rich description of the social context, adequate data collection and analysis strategies and analytical constraints/premises. Internal reliability is the degree to which multiple observers within a single study agree. This inter-observer reliability (McMillan & Schumacher, 1989) means there is agreement on the description or composition of events between participants whose data have been collected at separate times or locations.

Approaches to support internal validity include recording interviews to ensure everything is captured, then member checking of the transcription for veracity.

Reliability of a data set can be achieved if the research design allows for multiple measures of the same phenomenon and if these measures are similar even though they have been sourced differently. Inter-observer reliability is when a researcher uses different observers to rate the same people, places or events (Check & Schutt, 2012). If observers using the same instrument to rate the same things achieve a similar result, the reader can have some degree of confidence that the ratings reflect the phenomenon being assessed and as such can be considered reliable.

Human behaviour is complex and in order to capture data that reveal this complexity, and at the same time check that there is truth in the data set, data for a phenomenon of interest must be collected using two or more different methods. The process of collecting data about the same phenomenon using two or more different methods is known as triangulation (Cohen, Manion & Morrison, 2007, p. 141). Triangulation is a powerful way to ensure validity of the data set and may give confidence to subsequently reported findings after interpretation and analysis of data, if the triangulation process reveals concurrence of reported data. Similarly, triangulation may reveal incongruence of data collected about the same phenomena in which case the research design may need to change.

### **3.1.6 Sample Size and Sampling Method**

The choice of sample size and the method by which this sample is obtained is a significant decision by a researcher that will help determine validity of any data collected. Often, the population that could potentially be included in a study is overly large and it is not possible to include the whole population in the study, due to time,

cost or managerial restraints. In this instance of an overly large population, an adequate sample size needs to be defined that would give the greatest opportunity for perspectives in the population to be captured through some sort of cross section.

First, researchers need to decide if they need a random sample that would be representative of the whole population, or if they need a purposive sample that would represent a proportion of the whole population, that is, a subset population of interest in the study (Cohen, Manion & Morrison, 2007).

The random sampling method needs to ensure a sample that is representative of the whole population is obtained (Miles & Huberman, 1994). The required sizes could be calculated mathematically, as suggested in two publications by Bartlett, Kotrlik and Higgins (2001) and Cohen, Manion and Morrison (2007). Both these sources use advanced mathematics combined with a margin of error that the researcher finds acceptable, to suggest an adequate sample size based on the original size of the whole population. The authors agree on an adequate random sample size for whole population sizes that are small. For example, Bartlett, Kotrlik and Higgins suggest a whole population size of 100 could be represented by a sample size of 74 whilst Cohen, Manion and Morrison suggest a sample size of 73 would be required. Both of these sample sizes assume that the researcher would accept a confidence interval of 0.10; that is, that there is a 90% chance that the sample in the study is representative of a random sample of the whole population. As the whole population size increases, an adequate sample size also increases.

### **3.1.7 Ethical Considerations**

It is critical for research to be conducted in an ethical manner, which includes ensuring informed consent of all research participants where “the purpose of the research, its procedures, and any potential risks or benefits to the research



participant” (Liamputtong, 2009, p. 34) are clearly articulated to potential participants, such that they can make an informed decision about whether or not to take part. It is essential that potential participants know and understand that they have the right to refuse to take part or to withdraw at any time during the process without consequence. The age and cognitive capacity of the potential participant need to be considered and if the potential participant is not able to make informed consent, perhaps because they are young, then consent must be gained on their behalf (Liamputtong, 2009, p. 35). As well, potential participants need to be assured of their confidentiality and the confidentiality or anonymity of any contributions they may make, in addition to being informed of the processes put in place that will ensure this confidentiality (Liamputtong, 2009).

When researching with children as participants, protective behaviours such as those suggested by the Australian Government Department of Health (Australian Government, n.d.) may also need to be an ethical consideration. Such protective behaviours include being aware that students need to feel physically and mentally safe at all times and as such, researchers should conduct research processes that support and sustain this feeling of safety.

### **3.1.8 Conclusion of Section 3.1**

This section has described, in general terms, considerations that need to be taken into account by any educational researcher. For the reader of any completed study to respect and value the findings of the research, and agree that the findings are reasonably accurate, the researcher needs to ensure they choose the best possible research type to ensure reliability and validity of collected data, and use triangulation where possible. The whole study needs to be based on the best possible sample size

of the population involved in the study. The next section will describe the research methods undertaken in this study.

## **3.2 Research Design and Method for this Study**

### **3.2.1 Introduction**

This section will describe details of the research design of this study. Details that would allow the research to be replicated will become apparent throughout the following sections.

### **3.2.2 Research Settings**

Any researcher who wishes to undertake research in government schools in NSW must apply not only for ethics approval through their research institution, but must also seek approval through the State Education Research and Approvals Process (SERAP) administered by the NSW Department of Education (NSW DoE). This process requires approval of a research proposal that outlines the potential benefit of the research to the NSW DoE, and the manner in which the proposed research aligns with current priorities of the NSW DoE.

The proposed research in this study aligned with several areas of priority from three different organisations and this was used as supporting evidence to seek permission from the NSW DoE to undertake the study. First the NSW Secondary Principals' Council, made up of some 500 Principals from government secondary schools, stated seven education priorities for 2011–2015. Three of these priorities were directly addressed by the virtual provision: digital education, teacher professional development and quality curriculum and assessment (NSW Secondary Principals' Council, 2011). Second, the Australian Council on Education, Employment, Training and Youth Affairs had published a declaration to clarify the goals of education for young Australians. The virtual school addressed both of those

goals closely – Goal 1: Australian schooling promotes equity and excellence; Goal 2: All young Australians become successful learners, confident and creative individuals, active and informed citizens (Australian Council on Education, Employment, Training and Youth Affairs, 2008). Specifically, the VSSSP provided equity of access to a specialised curriculum for academically gifted students yet they could remain with the family and connected to the local community. Third, the NSW Department of Education & Communities (as it was named in 2014 and now known as NSW DoE) research priorities for 2012–2017 stated that the areas of priority included using digital learning environments, closing the divide between rural, regional and metropolitan students, and using digital learning environments to enhance teacher professional learning (NSW Department of Education & Communities, 2011).

In order to complete the approval request process, the supporting statements that illuminated connections as described above with identified areas of national and state educational interest, were defined on the SERAP application form as well as a brief outline of the planned research approach. The SERAP forms were submitted in 2013 and permission to conduct the study was granted later in the year. Approval was also gained from the University of New England (both approvals can be seen in Appendix B). The full research design and methodology were planned in detail and this detail will be expanded upon in the following sections.

### **3.2.3 Research Timeline**

The survey and interview data for this study were collected in April 2014 as a single cross-sectional snapshot of the VSSSP. Quantitative data from external standardised tests was collected as historical documents from 2012, 2013 and 2014. This longitudinal approach was chosen for standardised test data as the sample size for

each of the standardised tests was very small at less than 25 students in each test iteration. A longitudinal approach allowed some sense of confidence that the data from these external standardised tests were valid and reliable, and as such could be used as part of this study.

All collected data were then analysed and conclusions drawn over the following four years. The reasons for the delay were employment responsibilities and personal factors.

### **3.2.4 Research Type and Overview**

A case study research method was used in this ethnographic study of gifted students in rural, regional and remote areas, which was conducted in a natural setting designated as a bounded system (Cohen, Manion & Morrison, 2007; Yin, 2014). The case study approach was used because it allowed exploration, explanation and rich descriptions as given by research participants (Newby, 2014). The setting was natural as participants took part whilst they were in their normal school setting, and the system was bounded in that there was only one virtual school in the study. In fact, this was the only virtual school in NSW or Australia at the time.

The case study focuses on the way involvement with the VSSSP is perceived or valued by participants, if at all. A constructivist paradigm incorporating connectivism was used as participants held their own beliefs about the value, or not, of the VSSSP. These beliefs may have been supported or challenged by comments from other stakeholders. Language was a key source of data in this research, and the participants' perspectives were central (Cooksey & McDonald, 2010).

A mixed methodology approach allowed exploration of the complex interrelationships of the VSSSP in order to distil the how and why of any sense of value as well as how this sense of value may have been constructed, if any sense of

value was reported. By including students, parents and staff, a multi-method approach allowed triangulation involving the “use of multiple and different sources, methods, and perspectives to corroborate, elaborate, or illuminate the research problem and its outcomes” (Stringer, 2003, p. 57).

### **3.2.5 Research Design**

The research design was intended to find an answer to the research question “In what ways, if any, was the VSSSP valued in terms of meeting the educational and affective needs of gifted secondary school students in rural, regional and remote areas?”. To guide this question further, three sub-questions were also posed:

1. In what ways, if any, did the VSSSP support the learning and teaching of gifted and talented students located in rural, regional and remote secondary schools in NSW?
2. In what ways, if any, did being involved with the VSSSP support the students and staff with their mainstream classes?
3. In what other ways, if any, did being involved with the VSSSP develop the student or staff member?

To find a possible answer to the question and sub-questions all students of the VSSSP and their parents, and all staff of the VSSSP, were invited to take part in the research. As well, the principal of the local government-funded bricks-and-mortar school attended by the VSSSP student or staff member, was invited to take part in the research. All students, their parents and staff of the VSSSP were offered an online survey with a number of Likert-scale response questions as well as free text questions to offer more detail if they wished. The Likert-scale method was used instead of a potentially more nuanced semantic differential instrument (Geake & Gross, 2008) in order to force responses into a limited number of categories.

A sample of VSSSP students, their parents, staff and a sample of local school principals were interviewed in a semi-structured interview process. Quantitative data from external tests of achievement in reading, numeracy and science understanding were gathered in a longitudinal manner from VSSSP Year 9 results in 2012, 2013 and 2014.

Quantitative data from external tests of achievement were extremely useful in the endorsement of information gathered through survey and interviews regarding the perception of stakeholders in the VSSSP. The decision to use qualitative (such as interview) and quantitative (such as surveys) tools enabled a more detailed exploration of the research questions by employing complementary perspectives on the questions addressed (Miller, 2008). Figure 3.1 shows a diagrammatic explanation of the research design.

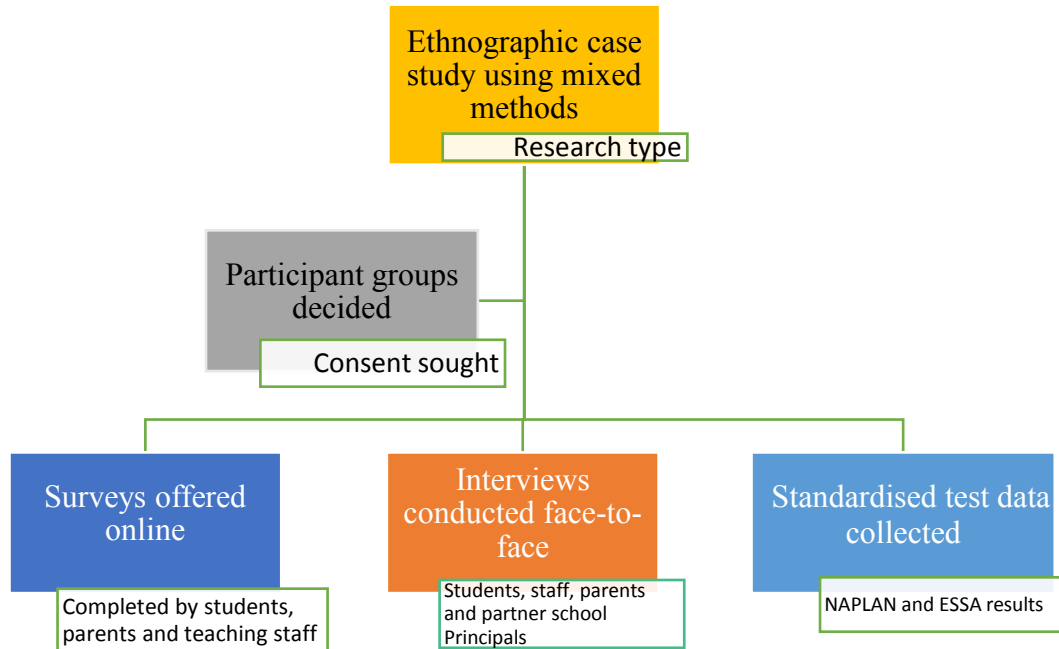


Figure 3.1 Diagrammatic representation of the research design.

### **3.2.6 Sample Size and Recruiting Research Participants**

To mitigate any potential selective observation tendencies (Check & Schutt, 2012) the sample size for this study was determined to be maximum variation (Miles & Huberman, 1994), in that all students enrolled and staff who taught in the VSSSP were invited to take part in the study. One parent from each family was also invited to take part, with the family deciding which parent this would be. The total number of students enrolled in the VSSSP at the time of data collection was 104 from 102 families (meaning there were a few siblings within the whole VSSSP cohort) and the total number of teaching staff was 28. The number of partner schools, that had either VSSSP staff, students, or both, was 28. By inviting all participants to take part in the research there was a mix of students and staff who had been with the VSSSP since inception through to those who had been with the VSSSP for a few months. There were also potential representatives from Central schools (small schools with Kindergarten to Year 12 on the one site), small high schools and larger high schools. This provided an opportunity for a variety of perspectives and local contexts to be captured. If the VSSSP were larger, this sampling method would be too cumbersome; however, the small numbers of students, teachers and parents made the sampling process manageable. The sample size allowed all survey data from all participants to be used for analysis and interpretation. In this way any perceived Insider researcher bias was mitigated and the limitations of the case study method reduced.

A control group for this study was not possible. There was not a similarly-identified group of gifted students in western NSW Region that were not involved in the VSSSP, and in Years 7—10 in western NSW Region public schools there were no other students that took part in a blended learning environment on a daily basis.

Comparison of results in standardised tests for gifted rural students in the VSSSP and not in the VSSSP could provide one aspect of a control group comparison but this aspect is not related to the purpose of the research, which is to identify the value of the VSSSP as perceived by students, teachers and other staff connected to the VSSSP.

The different participant groups were designed to allow validation of any data captured in the student responses by using a variety of perspectives to report on the same event. Each of these groups were provided with an information sheet detailing the purpose of the research and a consent or assent form which had to be signed and returned to the researcher prior to the commencement of research. As some VSSSP students were under the age of 15 years, and as such were minors and could not sign a consent form, assent and consent forms for student participation were emailed to parents. Distribution by email was chosen as the VSSSP already had in place a system of email permission notes for other educational activities and the surface post in some cases could take weeks to arrive for some potential participants. Parents were clearly advised that their reply email with a completed consent and assent form attached would be considered consent. Information about the research sent to potential participants and the consent/assent forms can be seen in Appendix C.

Interviews were not conducted with all participants due to time and cost constraints. To arrange a suitable sample, a stratified purposive sampling method (Miles & Huberman, 1994) was used. First, schools were assigned pseudonyms (School A through to School AB – 28 in total). School names were written on small, equally sized, pieces of paper, then on a separate set of the same small pieces of paper, school pseudonyms were written. One piece of paper from each set was chosen randomly and the combination recorded. This system meant confidentiality



was maintained as the schools were not listed alphabetically, nor by enrolment size. Other than the researcher, no person knows the connection between pseudonym and school name. Once pseudonyms had been assigned, the schools were divided into two sets; one set for schools with more than 500 students enrolled and the other for fewer than 500 students enrolled. The enrolment number of 500 was chosen because at the time of data collection, Principal classification had four levels of recognition based on school enrolment. An enrolment of fewer than 500 enrolled students represented two principal classification levels, and this divided the participating schools in the VSSSP into two approximately equal sets. Schools with more than 500 enrolled students numbered 15 out of 28 and schools with fewer than 500 enrolled students numbered 13 out of 28. For each participant group interview sample, the relevant school names were chosen from the two sets, kept separate, then the pieces of paper were folded so that the selection could not be made deliberately. Relevant names were defined for those schools with participants for the interview group under question, where consent had been granted by participants. For example, 28 schools were part of the study and of these 28 schools seven Principals from each set (fewer than or more than 500 enrolled students) consented to be interviewed. From these seven, three from each set were randomly chosen from the folded collections of names.

The student interview sample was chosen by first stratifying the school names into Year groups (Years 7, 8, 9 and 10), then for each Year group stratifying the school names into fewer than or more than 500 enrolled students. The school name was chosen at random from the double stratified set, and all VSSSP students enrolled at that school in that Year group were interviewed. This method was chosen to avoid any perceived personal bias by the researcher for any particular student and

to preserve anonymity. In a small school that may have had two VSSSP students enrolled, to interview one and not the other may have allowed the interviewee to be identified.

The staff participants selected for interview were chosen at random once they had been stratified into their Key Learning Area (KLA) categories first, then school size category. A purposive sample of three teachers from each KLA of English, mathematics and science who came from a mix of large and small schools were interviewed. The total number of staff at the VSSSP was 28 with 12 staff situated in small schools that had fewer than 500 enrolled students, and 16 staff in larger schools with more than 500 enrolled students. The total number of staff who agreed to be interviewed was 20, which represented 71% of all staff. Eight staff, or 40%, who consented to interview came from smaller schools; one taught English, three taught mathematics and four taught science. Twelve staff or 60% of those who consented to interview were from larger schools. Five of these staff taught English, three taught mathematics and four taught science.

An important part of ensuring anonymity is that interviewees chose their own pseudonym to be used within the report generated. They were encouraged to choose a name that they alone would recognise as their own pseudonym, and their chosen pseudonym was used within the file returned for member checking. A critical point is that using the stratified purposive sample method for each participant group resulted in 23 of the 28 partner schools being represented by either the Principal, the VSSSP staff member, the parents or a student. This means that 82% of the partner schools of the VSSSP are represented in the interview data, along with 100% of partner schools in the survey data.

### 3.2.7 Research Model

Research often has a model upon which the development of a written argument is based. Researchers will write their argument in several phases that are aligned with each of the structural parts of the model. The model in this research can best be described diagrammatically. Figure 3.2 shows the different themes that became apparent from the literature review, placed in a model. The themes identified in the literature review were combined with knowledge about apiaries, as well as reference to two other suggested models for analysing the effectiveness of technology use in gifted education and one model for investigating virtual support for early-career teachers in rural, regional and remote schools in NSW. The models for technology use and early-career teacher support have been described previously in Chapter 2.

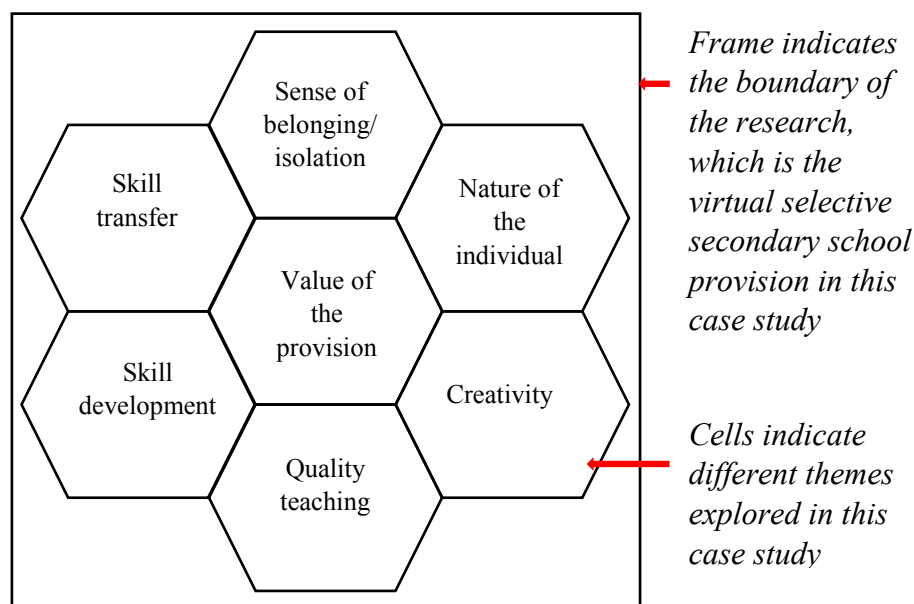


Figure 3.2 Diagrammatic representation of the research model.

The two other research models include the Five P Model suggested by Pyryt (2009) and the Enable, Enhance, Transform model suggested by Chen, Dai and Zhou (2013). Both of these models recognise the unique nature of education for gifted students using technology and the urgent need to increase research that can offer

evaluation of programs, to identify what works. The impact of virtual support for early-career teachers was conducted by Manwaring (2013) in a similar geographical area to this research.

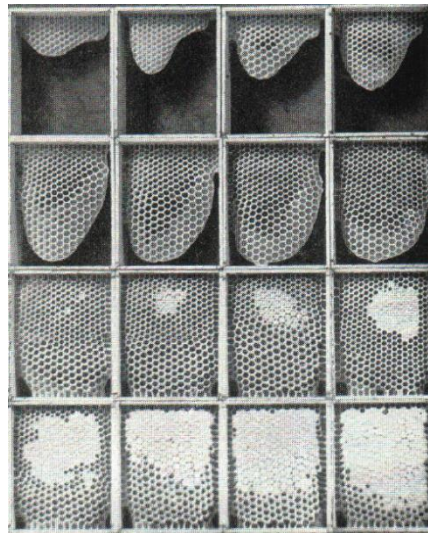
The preferred approach was to combine more contemporary research fields into the model, whilst highlighting one of the most poignant realities of gifted rural adolescents – the need to belong; to find a group of like-minded peers. To achieve this outcome, research into creativity, which is a burgeoning field in the current environment, research into learning disposition as defined by the nature of the learner, skill transfer into other environments and the development of 21st-century skills have been synthesised. Many educators find it impossible to separate students from teachers as the two are so essentially interwoven, hence the inclusion of quality teaching as an element of the model. The central cell, the value of the provision is impacted or influenced by all the surrounding cells. The model shows the belief that the value of any educational provision for gifted learners needs to be viewed through a number of lenses and is in direct response to the call “if gifted education is to improve, the research base must shift from describing the phenomena of giftedness to identifying and verifying best practices for gifted education” (Jolly & Kettler, 2008, p. 441).

Originally the cells in the model had a different focus. Each cell was for the perspective of different stakeholders; student, parent, teacher or partner school, with the central cell reserved for the value of the provision. As material from surveys and interviews was analysed, a richer more descriptive model was developed, that preferred student voice. The final themes are the names of the different cells in the model shown in Figure 3.2 with the central cell being the value of the provision (the main research question). The decision to report separately on participant group

perspectives, as seen by the various stakeholder groups in the research was made after all data were collected. This change in focus did not have any impact on the research question which remained unchanged. Rather, the manner of finding the response to the research question was altered and improved as different perspectives, and how they had been developed were able to be captured within an analysis of the themes.

The diagrammatic model chosen for this research is based on the ancient and natural craft of bees. In a beehive, there are a number of different types of bees. Each type of bee has its own role to play, but the collective effort of the bees produces a food source that can be shared among them. Alternatively, the hive can be robbed by the bee keeper, and the product used as a food source for humans (BBC, 2011). The food source is honey. Those with cultural experience of honey will know it has many uses, not only as a food source—for example, as an antiseptic dressing for cuts to the skin (Israili, 2014). In other words, once honey is taken from the hive, it can be distributed to others and they can use it as they choose in a manner that suits their purpose at the time.

To store the honey, bees first make a wax frame that is efficient in its use of space and engineered to hold quite a weight. While it is the worker bees that make the wax frame, the process starts from the top of the hive, analogous to the idea and framework of the virtual secondary school provision coming from the top (or senior management) down. Figure 3.3 shows how the container to hold the honey created by the bees (the honeycomb) takes shape, from a misshapen beginning (at the top of the image) to fill the entire space available (at the bottom).

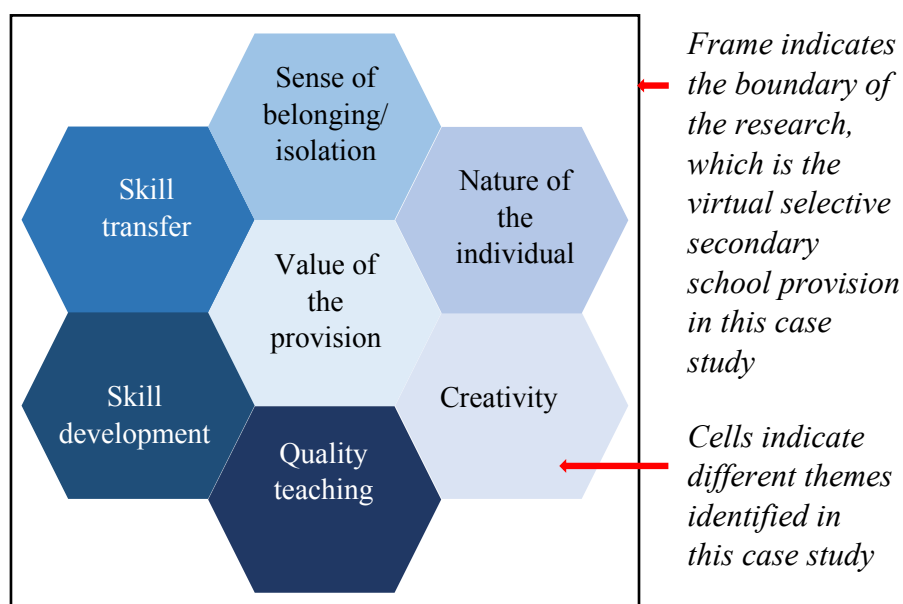


*Figure 3.3* Natural honeycomb construction by bees. Source: Wikimedia Commons contributors (2015).

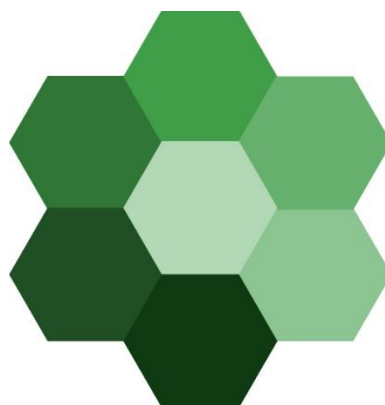
More bees actively contribute to the honeycomb-building process over time; the (wax) framework built by others is filled with valuable material (honey) by a number of bees, and it is this collaboration that makes a stable and valuable resource. The honey in this research is the conclusions drawn from processed data collected from surveys, interviews and standardised external tests. Compared with other shapes, the hexagonal shape of each wax cell uses the least amount of wax (BBC, 2011). The diagrams following use the analogy of the beehive to present a visual model of the current research. The hexagonal cells reflect the low-input nature (least amount of wax) of the virtual secondary school provision.

Each differently coloured group of cells in the honeycomb diagrams (Figures 3.4–3.6) represents the perceptions of a different group of stakeholders in the virtual secondary school provision; that is, the students in blue (Figure 3.4) with the themes and boundary of the research model overlaid for clarity, their parents in orange (Figure 3.6) and the staff in green (Figure 3.5). The different coloured cells will be used as a guide for the reader in Chapter 5, when results from different participant groups are combined for discussion. Within a coloured group of cells in the

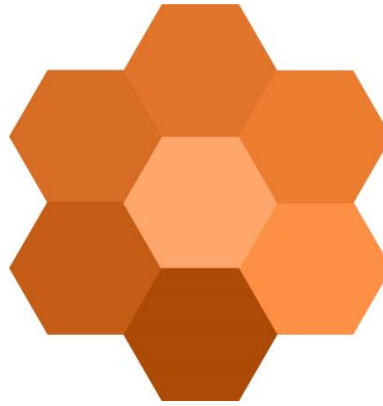
honeycomb diagram, the different themes that emerged from the survey, interview data and literature review in each stakeholder group will be described separately in the results. Each cell will be described in detail using data gathered from surveys, interviews and, where appropriate, standardised external tests.



*Figure 3.4* Diagrammatic representation of the research framework for student participants.



*Figure 3.5* Diagrammatic representation of the research framework for staff participants.



*Figure 3.6* Diagrammatic representation of the research framework for parent participants.

### **3.2.8 Data Collection Instruments**

#### **3.2.8(i) Survey instruments**

The NSW DEC intranet holds many well-constructed surveys to elicit information about schools, the students and the parent body. Topics range from quality of school life to homework practices and the quality of the learning environment (NSW DEC, 2010c). These instruments have been developed by the Australian Council for Educational Research (ACER) and rigorously tested by the NSW DEC using thousands of respondents. They are considered reliable instruments by NSW DEC and they formed the basis of the surveys offered to participants in this research.

The survey instruments were very similar for all participant groups. A complete set of survey instruments used in this study can be seen in Appendix D. There were two sections for each survey instrument. The first section had demographic questions for each participant group. The student survey had four demographic-type questions about the student's Year group, their Aboriginal and Torres Strait Islander identification status, how many years the student had been with the VSSSP, and the approximate student enrolment of the local bricks-and-mortar



secondary school attended by the participant student. The parent survey had these same four questions and a further two questions asking if there were any special education needs of their child in addition to their giftedness, and the language normally spoken at home by the student and their family. The staff survey had five questions of demographic data about the staff member including the highest level of educational qualification held, how long they had been teaching overall, how long they had been teaching in the VSSSP, which KLA they taught and the student enrolment numbers at their base high school.

The second section of each survey then asked respondents to record their level of agreement or disagreement with approximately 50 Likert-response statements incorporating the themes identified during the literature review. The survey questions were asked in a random order, not by theme. The identified themes were developed through the literature search: a sense of belonging or isolation; creativity; development of a 21st-century skill-set; any transfer of skills from the VSSSP to the local school classes; the nature of the individual; and quality teaching elements. Interspersed throughout the survey were five extended response opportunities for respondents to explain in as much detail as they wished, a particular point of view. The final question on each survey was an extended response question asking if there was anything else the respondent wished to add.

### **3.2.8(ii) Interviews**

The research design was to interview a maximum variation sample through purposive stratified sampling (Miles & Huberman, 1994) of students, parents and staff to elaborate on the findings of the surveys. This sampling method allowed principals from small and large schools, students in all Year groups, staff from each KLA, and parents from small and larger communities to have a voice during the

interview process. The interview questions for all participant groups are attached in Appendix E. The interviews allowed language to form the basis of the data collected. It is important to note that no linkage between any individual survey or interview response was intended, in order to preserve the privacy of all research participants who potentially could be identified through a process of elimination in their small population schools and rural communities. Identification and linkage may have also provided an opportunity for skewed results from unintended researcher bias from my Insider researcher status (Smales, 2002) or potential Hawthorne effect (Neuman, 2011) originating from the research participants. These two biases were a possibility at any time so the design had to account for this risk and minimise, mitigate or remove the risk at all times. If student participants thought their responses could be identified, they may not have accepted an invitation to take part in interview, particularly if their views may have been considered controversial. In the demographic questions at the beginning of the survey, the students had to respond to a question about what Year group they were in. If linkage had been in the design and students had answered the question inaccurately, further processing of the data could have exacerbated the error. In turn, findings may not have been accurate or trustworthy.

### **3.2.8(iii) Data from standardised external tests**

An independent perspective about the academic value of the VSSSP is afforded using data collected from standardised external tests conducted by the NSW DoE. Every student in Year 7 and Year 9 in Australia completes the NAPLAN literacy and numeracy test and every student in a government school in NSW completes the state-wide ESSA science test in Year 8. These external standardised academic tests can be used to check the progress of students in one school compared

with similar students in similar schools in a different geographic location.

Interpretation of standardised test data follows a published process used by the NSW DoE (see SMART data, Appendix F). This process includes recording the improvement of the student from one NAPLAN test iteration to the next in Reading, Writing, Spelling, Grammar and Punctuation as well as Numeracy, then reporting this as student growth. The NSW DoE uses statistical analysis to predict a band of expected growth of any student, based on their starting score. Student actual results are recorded as being above or below expected results, as well as in a numerical format. Results for student participants in this case study for Reading and Numeracy only were evaluated as the Writing section style changed mid-way through data collection. The writing style changed from creative writing to factual recount. A comparison of growth was therefore not available from the NSW DoE for all years included in the data set. Spelling, grammar and punctuation NAPLAN results have not been included in the research design due to not being available from the NSW DoE as separate results.

Analysis of NAPLAN and ESSA data for successive VSSSP student cohorts over a number of years, can gauge academic progress on a national and state-wide comparison basis without the potential bias of a locally designed test which may not be a fair representation of what students know and can do. The comparison can then be used to support or challenge the response by students to the question “In what ways, if any, was the VSSSP valued in terms of meeting the educational and affective needs of gifted secondary school students in rural, regional and remote areas?”. For example, if the students indicate that the provision has been of value in a survey and in interviews, and the academic data indicate the provision had been of value as measured by standardised external tests, assuming the sample size was

adequate in the first instance, then the value reported by students can be taken as being real for these students in this virtual secondary school provision.

### **3.2.9 Administration of Data Collection Instruments**

#### **3.2.9(i) Administration of survey instruments**

In the first phase, the survey, a maximum variation sample was chosen as suitable in order to capture as much information as possible in a timely and cost effective manner. More detail about the sampling method was included above in Section 3.2.6. All staff, all students and one parent from each family at the VSSSP who had consented to take part in the research, were sent a link to the survey web address (from the researcher's research institutional email address, not the incumbent position email address) and participants were invited to complete the survey online. The survey instruments are attached in Appendix D. The online method of survey distribution and completion was chosen because the school already communicated via email for a number of purposes including newsletters and school policy documents, and there was significant email traffic between teaching staff, students, and the administration office. As well, surface mail could take weeks to arrive at some participants' home address and sending surface mail back could again take weeks. The online method of communication for research purposes not only emulated virtual learning but used the existing method of communication within the virtual school which enabled a feeling of familiarity of the process for research participants.

#### **3.2.9(ii) Administration of interview instruments**

In the second phase, interviews, not all research participants were interviewed due to time and cost constraints but stratified purposive sampling (Miles & Huberman, 1994) allowed a broad cross section of participants to be included as

described in Section 3.2.6. Interviews took approximately 45 minutes each and were recorded.

Principals of three schools from each of the two school size categories were interviewed, six in total, which represented 21% of the total number of school principals and 43% of the number of principals who agreed to take part in the interview process. Partner school principal comments are reported in the same section of this thesis as VSSSP staff, but are clearly marked.

A sample of students from each Year group and from a variety of local school enrolment sizes were interviewed. The number of students who agreed to be interviewed was 50, 21 of these from larger schools and 29 from smaller schools. Student interviews numbered 21 which represented 42% of the student participants who consented to take part in interviews. Of the 21 students interviewed, 12 were from smaller schools and 9 were from larger schools. Purposive sampling of parents to match the student interviewees allowed confirmation of student perspectives. Parents were interviewed at a separate time to the students, except in one instance. One family, who identified as Aboriginal and Torres Strait Islander, asked to be interviewed as parent and child together and this request was granted as it was based on cultural preferences. Interviewing parent and child separately allowed each of the students or parents to be as frank as they wished in the interview and allowed for any conflicting perspectives from within the family to be captured. Interviewing parents and students from the same family allowed for a check of validity of data captured and allowed for any disparate views from within the same family to be explored.

Staff interviews numbered nine (three from each KLA), representing 45% of all staff participants who consented to interview. Five of the staff interviewed, or 55%, came from schools with fewer than 500 enrolled students and four of the staff,

or 45% came from schools with more than 500 enrolled students. The single available English teacher from a small school was interviewed as well as two teachers from larger schools. Two mathematics teachers interviewed were situated at smaller schools and one at a larger school and two science teachers interviewed were from smaller schools with one science KLA VSSSP staff member interviewed situated at a larger school.

Two senior executive staff at the VSSSP were interviewed as part of the staff interviews. Their comments are clearly separated from other school leaders or staff at the VSSSP, but are included in the sections where staff results are reported or discussed. One senior executive staff member had been with the VSSSP since 2011 and the other since 2012.

Recording the interviews allowed the researcher to listen to the full response and collect everything the interviewee said rather than relying on notes taken while the person was talking. Such notes may have been too brief, affecting the quality of the data collected, or have the opinions of the interviewer embedded in them, forming a bias that did not actually exist (Welsh, 2002). Rather than over the phone or by email, the interviews were conducted face-to-face, with the researcher travelling sometimes a considerable distance to the secondary school of the participant. This technique allowed social cues such as voice, intonation and body language to provide extra information to the interviewer (Opdenakker, 2006, para. 7).

### **3.2.10 Methods of Data Analysis**

First, the entire survey offered to students was analysed using the Rasch model of item response theory (Bond & Fox, 2007; Wright & Linacre, 1994) to confirm or refute the construct validity of the survey instrument as a whole. Each theme identified in the research model outer cells was analysed using the Rasch

model of item response theory to ensure construct validity still existed for that theme when viewed in isolation. As the survey questions were identical in nature with a simple change in the subject (for example “you” changed to “your child” between parent and student surveys), the Rasch analysis of the student surveys was extrapolated to include the construct validity of the other surveys used. The Rasch model of item response theory also helps to identify responses that might be spurious as the process identifies an expected response range for each question and constructs boundaries for that acceptable probability. An overfit of the data ( $<0.6$ ) would suggest that the survey was leading the respondents to answer in a particular manner, while an underfit of the data ( $>1.4$ ) would suggest that respondents were guessing answers. Guessing answers could lead to the collection of a meaningless set of random responses. If data nestle into the centre of the Rasch model infit mean-square analysis boundaries, then they can be considered acceptable as there is sufficient variation in the responses that reflect the expected variation in a normal population.

Other methods of statistical analysis were considered before being disregarded. One such consideration was Exploratory Factor Analysis (EFA), which was rejected as the required sample size was not met by the sample size available in this study. Yong and Pearce (2013) recommend a sample size of at least 300 to ensure EFA results may be considered reliable. In this case study the total available sample size was 104. Another reason to disregard EFA as a possible analytical tool was that there were six themes with only (potentially) 104 respondents, giving too many themes for the number of respondents.

Responses to open-ended questions asked in semi-structured interviews with teachers, students, parents and local school principals were recorded and transcribed and the transcriptions investigated using NVivo<sup>®</sup> software (QSR International, 2014).

Through coding of the data, it was thought that some other categories and concepts in addition to those identified in the literature search (Lichtman, 2010) might arise that could be used across all participant groups in the research. This did not occur so the themes were left as reported in the research model, which was generated using the literature review.

Data gathered from standardised tests have not been treated with any analysis tool as the sample size is so small and is considerably different from any comparable data. The closest comparable data would have been similar students in Western NSW Region schools who were not part of the VSSSP, but even this data measures in the several hundred, whilst the sample data measures approximately 25. To address this lack of analysis, data from successive years have been collated in order to offer a longitudinal view that may add to some sense of trend.

### **3.2.11 Triangulation**

This case study of the first virtual selective secondary school in Australia using mixed research methods has a triangulated design (Punch, 2009). Qualitative and quantitative data collected from surveys and interviews of students, teachers, parents and partner school principals were combined with quantitative data collected from standardised external tests such as the Australia-wide National Assessment Program for Literacy and Numeracy (NAPLAN) and the state-wide Essential Secondary Science Assessment (ESSA). As NAPLAN in secondary schools is a Year 7 and Year 9 literacy and numeracy test, and ESSA is a Year 8 science test the combination allowed a snapshot of three year groups at the same time in any one calendar year.

When the student responses to the survey and semi-structured interview questions were combined with data from standardised external tests and other



participant group surveys, there was evidence from different sources about the same question (Punch, 2009). This triangulation increased the reliability of the results by increasing the convincingness (Cooksey & McDonald, 2010) of the student responses to the survey and semi-structured interview questions.

### **3.2.12 Ethical Considerations**

As the researcher was an Insider researcher (Smales, 2002) great care needed to be taken to avoid any potential Hawthorne effect (Neuman, 2011) as the researcher's incumbent position at the beginning of the research period was as a senior officer at the VSSSP. As well, some of the research participants were minors (under the age of 15 years) and as such needed to be treated with extra care. In the first instance, research permission and email contact details of potential participants were sought from the NSW Department of Education and Communities. Participant contact information was readily available to the researcher as a senior officer of the VSSSP but this source was not used. Instead contact details of students and parents as provided by the Principal Education Officer of the VSSSP were used in this study. Further steps taken to limit any unintended influence included:

- taking extended leave (6 months) from the incumbent position at the VSSSP during the data collection and research design process phases so as to be unavailable for any VSSSP matters;
- conducting all correspondence about the research online with participants, from an email address provided by the research institution, not the work email address;
- providing a mobile phone number to participants that was different from the work mobile phone number and using this new mobile

phone number for any conversations with adult participants (such as to arrange an interview time);

- offering all participants the choice to only take part in the online phase of data collection (the survey) or to also take part in the interview process;
- communicating as a visitor would normally communicate with a school to arrange visits for the purpose of interview with students, which was via the front reception desk in administration;
- wearing a Visitor badge while at the local school to conduct interviews;
- conducting interviews at the local school of the participants in a room allocated by the local school Principal (not the VSSSP room) and ensuring that protective behaviours for children were followed such as the researcher not sitting between the access door and the student, but ensuring the student sat closest to the door during interview;
- further protective behaviours including not closing the door of the room during interview; and
- asking questions at the beginning of the interview that student participants might assume were already known by the researcher (enrolled Year, how long the student had been with the VSSSP) to indicate that no prior information or knowledge would be used by the researcher.

Further mitigation efforts included asking if students would like a support person with them during interview. Two students chose to have a support person, one of whom was the other VSSSP student to be interviewed at that school, and one student

who identified as Aboriginal and Torres Strait Islander requested their parent be present. Both requests for a support person were granted instantly.

### **3.2.13 Credibility, Rigour and Trustworthiness**

Credibility and trustworthiness have been addressed in this research method in several ways. First, all student enrolments in the VSSSP were invited to take part in the study. This gave as wide a variation of constructed worldview as was possible in this study, as the whole population was small enough to allow full participation. Without preferential treatment of any particular Year group, gender, local school size or length of time a student had been enrolled in the VSSSP, all perspectives, potentially, could be captured. Second, all staff who taught in the VSSSP and all partner school Principals were invited to take part in the research. This approach again provided the widest variation of perspectives that could potentially be captured. As with all students, one parent from all families at the VSSSP was invited to take part in the research. Families decided which parent would be the participant, which removed any potential bias from families who had two or more children at the VSSSP, or were a single-parent family unable to provide two parent responses.

Trustworthiness has been addressed by recording all interviews, then transcribing them and once transcribed, transcriptions were returned to and confirmed by the interviewee for accuracy. This member-checking process (Liamputtong, 2009) mitigated any unintended researcher bias and allowed participants to offer corrections if errors were found. As well, interviews were conducted in the natural school setting of the participant so that they felt relaxed and confident in their surroundings. Parents were also interviewed at the school except in one case where the parent requested they be interviewed in their personal office as they were unable to leave work.

Rigour has been addressed in this research by ensuring an identical Likert response scale (five levels) for each survey question and the insertion of similar questions asked in the opposite manner to check that respondents were not simply choosing the one Likert response for the entire survey. A direct check of those questions that are asked in the opposite manner will help readers to believe that responses have been made with care, and as such, have been answered truthfully by the participant. Rigour has also been addressed by using the same survey questions, with small adjustments in subject (“you” replaced with “your child” for example), for both student and parent participants. In this way, if one participant group provided responses that were the antithesis of the other, then there would be an alert that data may need to be disregarded.

Another aspect of rigour that has been addressed is the source of external data from standardised tests of achievement. The data were provided to the researcher by a senior manager to avoid any unintended bias from inclusion or exclusion of any data from any participant. Only data that can be matched in subsequent years with the same student have been included as without this matching, the data are meaningless with regard to student educational growth.

### **3.2.14 Transferability and Dependability**

As the setting for this research is unique in Australia, and potentially the world, since the provision *replaces* curriculum in the bricks-and-mortar secondary school with curriculum offered online, the need for this research to be transferable to another setting is of great importance. However, as so much depends on the particular setting that is the focus of this research, including the location, the lesson delivery methods, the management and sharing of student achievement data, the political atmosphere and school funding, as well as more broad ideas such as the role

of technology enhanced learning, this study may be the first of its kind. As such, rich detail has been provided about the day-to-day operation of the VSSSP so any future attempts to replicate this study may be aware of all facets that would need to be considered in any replication.

Measurement sensitivity has been considered by using a five-point Likert scale survey question response option in the survey instrument combined with open-ended questions where participants could expand on their Likert response. For example, if the participant chose Strongly Agree in the Likert response survey question, they had an opportunity with a free response question immediately following to offer further evidence to justify their point of view. This arrangement allowed deep investigation of the Likert responses through analysis of the text supplied by participants.

The data-collection process and methods used have been faithfully documented and reproduced in this thesis. Decisions made about method and methodology have been supported by argument. Rich description of the research setting and the participants has been provided. As well, the political climate in the broader education field at the time of data collection has been documented and shared in previous chapters.

### **3.2.15 Summary of Section 3.2**

For research to be considered acceptable, the methods used need to be described in detail. This section has described the research setting and timeline of the research, the research type (case study) and the final research design used. The sample of participants, including the sampling method, was presented followed by a diagrammatic representation of the research model, using the metaphor of bees and the production of honey. Instruments used to collect data and how these instruments

were administered were recounted, along with an overview of the analytical methods used to interrogate the data collected and the use of triangulation. The reasons for decisions have been provided. Ethical issues were discussed and arguments were provided for the credibility, rigour, trustworthiness and reliability of data collected, as well as considerations of transferability and dependability. The detail in the different sections was provided to indicate that suitable methods were used and correct procedures were followed.

### **Summary of Chapter 3**

This chapter has described both the general methodology and the specific methods used in this research. The boundaries of the study have been clearly articulated and the different participant groups defined. As well, this chapter revealed the mixed method instruments, sampling procedures and standardised tests that were used to build a picture of the VSSSP.

The next chapter, Chapter 4, will share results from the different participant groups and the results of external standardised tests of achievement.

## Chapter 4: Results

The results for this mixed method case study will be presented in several sections. First, the response rates, demographic data and analysis tools will be described in Section 4.1. Second, the results from student surveys and interviews will be described in Section 4.2. In this same section results from parent surveys and interviews will be reported. Third, staff survey and interview results will be presented in Section 4.3 and in this same section results from interviews conducted with partner school Principals will be reported. Finally, results from external standardised tests completed by the students at the VSSSP will be presented in Section 4.4.

As discussed in Chapter 2, the main question this research aims to answer is, “In what ways, if any, was the VSSSP valued in terms of meeting the educational and affective needs of gifted secondary school students in rural, regional and remote areas?”. The research also seeks to answer the following sub-questions as a way to measure the value of the VSSSP:

1. In what ways, if any, did the VSSSP support the learning and teaching of gifted and talented students located in rural, regional and remote secondary schools in NSW?
2. In what ways, if any, did being involved with the VSSSP support the students and staff with their mainstream classes?
3. In what other ways, if any, did being involved with the VSSSP develop the student or staff member?

## **4.1 Response Rates, Demographic Data and Analysis Tools**

### **4.1.1 Response Rates for Student and Parent Surveys and Interviews**

Separate student Year group categories did not receive enough responses to be considered valid as individual categories (see Table 4.1); therefore, the whole-school sampling method was used with all the student responses combined to represent student voice. The preference was to have individual Year group categories valid in their own right in addition to the whole-school method. This would then allow the most robust discussion of observed results, as it would have allowed a comparison of Year groups. However, only the whole-school method resulted in an adequate sample size for the findings to be considered valid and potentially transferable to other contexts. In comparison to similar research conducted, the response rates were large (Table 4.1). Thomson (2010) received a 7.2% response rate and Ng & Nicholas (2010) received responses from 25% and 16% of students respectively in each phase of the research reported.

At the time of data collection the entire VSSSP student population across Years 7–10 was 104 students. The returned survey sample sizes in Table 4.1 indicate some challenges in establishing validity due to the small sample size. The survey was attempted by 47 of the 52 students (90%) who agreed to be part of the research. Students who agreed to be part of the research represented 50% of all students at the VSSSP. All but three of the 47 survey attempts were completed in full; one incomplete attempt had no questions answered at all, so was disregarded. The other two incomplete attempts had the majority of questions answered. These two attempts



were included in the results of questions that were answered. Unanswered questions were extended response items only.

Table 4 .1

*Response Rates for Student Stakeholders to be Part of the Research*

Year Group	All Students N	Consenting Students N	Consenting Students % of Year Cohort
Year 7	28	12	43
Year 8	28	16	57
Year 9	21	8	38
Year 10	27	16	59
Total Students	104	52	50

Interviews were conducted with 21 students. This number was considered adequate, as it involved students from a range of different school types and a range of school years as the sample had been selected in a stratified purposive manner as described in Chapter 3. As it transpired, the interviews of students from different school types and different Year groups were very similar and the interview transcriptions were capped at five responses as the data were saturated with very little new data emerging in subsequent analysis of interviews (Liamputtong, 2009). Transcribed interviews represented each Year group and both small and large schools.

#### **4.1.2 Demographic Data for Student and Parent**

##### **Participants**

The student population for this survey can be summarised as being predominantly of non-Aboriginal or Torres Strait Islander descent, as shown in Figure 4.1; from a mix of year groups from Years 7 to 10, as shown in Table 4.2; and from a mix of small-sized and larger secondary schools, as shown in Figure 4.2.

Approximately one third had been with the VSSSP for more than two years, one third for two years and one third for less than two years, as shown in Table 4.3.

According to the Rasch analysis (which will be described in the next subsection), this sample is indicative of a representative sample from the VSSSP student population at the time of data collection.

Table 4.2

*Academic Year-Group of Student*

*Survey Respondents*

Answer Choice	Responses N	Responses %
Year 7	10	21.74
Year 8	16	34.78
Year 9	7	15.22
Year 10	13	28.26
Total	46	100.00

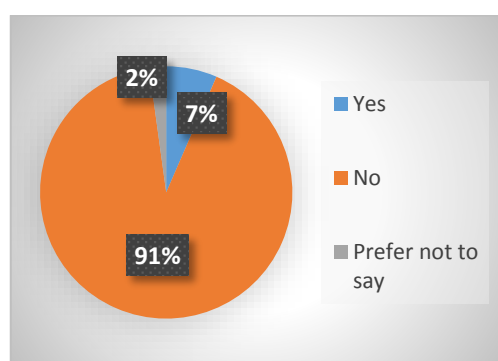
Table 4.3

*Calendar Year when Student*

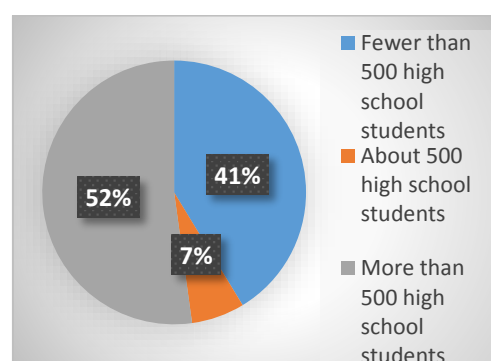
*Involvement with the VSSSP*

*Commenced*

Answer Choice	Responses N	Responses %
2011	6	13.05
2012	10	21.74
2013	17	36.96
2014	13	28.26
Total	46	100.00



*Figure 4.1* Aboriginal or Torres Strait Islander identification of students.



*Figure 4.2* Approximate size of base school attended by the student survey respondents.

At the time of data collection, there were 102 families with students enrolled in the VSSSP indicating that there were a few siblings within the whole school

cohort. The parent population (one member from each family), comprising those parents who agreed to take part in the research, numbered 50 (49%). Only one parent from each family was surveyed and they answered on behalf of both parents for their child/children. The Year group demographics of the parent respondents are shown in Table 4.4. The number of completed parent surveys was 46. Parents were asked very similar survey questions about their child, to those the student was asked in their survey about themselves, in an attempt to corroborate what the students said about themselves. The survey instrument, as seen by the parent respondents, is included in Appendix D. In summary, parents indicated they were parents of students who were of predominantly non-Aboriginal or Torres Strait Islander descent, as shown in Figure 4.3; from a mix of year groups from Years 7 to 10, as shown in Table 4.4; and from a mix of small-sized and larger secondary schools, as shown in Figure 4.4. [The results for parents and student responses to the question about school size did not match exactly which could be due to one group knowing or looking up the school enrolment and the other not.] Approximately one third of parents indicated their child/children had been with the VSSSP for more than two years, one third for two years and one third for less than two years, as shown in Table 4.5.

Table 4.4

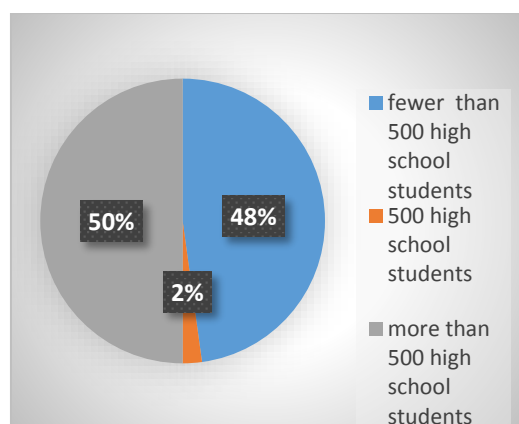
*Year-Group Distribution of Parent Survey Respondents*

Answer Choice	Responses N	Responses %
Year 7	12	26.09
Year 8	12	26.09
Year 9	9	19.57
Year 10	13	28.26
Total	46	100.00

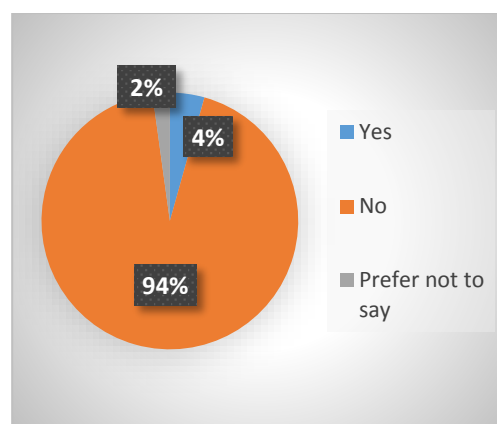
Table 4.5

*Calendar Year When Involvement with the VSSSP Commenced*

Answer Choice	Responses N	Responses %
2011	6	13.05
2012	10	21.74
2013	16	34.78
2014	14	30.43
Total	46	100.00



*Figure 4.3* Approximate size of the base school attended by the students, as reported by parents.



*Figure 4.4* Aboriginal or Torres Strait Islander identification, according to parent respondents.

In order to preserve anonymity there was no attempt to match student and parent responses together. For example it is clear that more Year 7 parents than students responded to the survey (N= 12 and N=10 respectively). In such small communities anonymity had to be preserved.

### 4.1.3 Response Rates for Staff Surveys and Interviews

The entire staff population in the VSSSP at the time of data collection comprised 28 teachers across the three key learning areas (KLAs) of English,

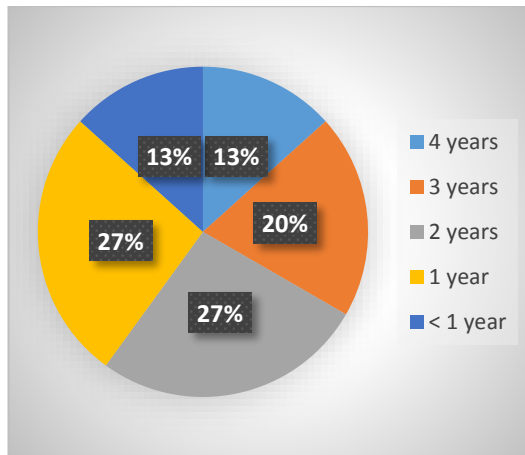
mathematics and science. Most teachers (23) worked 0.4 full-time equivalent (FTE) with the VSSSP and 0.6 FTE with their local school; however, five staff worked 0.8 FTE with the VSSSP. One of the 0.8 FTE staff members worked in both the science and mathematics KLAs in the VSSSP at 0.4 FTE in each.

The majority of staff at the VSSSP (68%) agreed to take part in the research project. The proportion of FTE was not regarded as relevant to the value of the opinion of the staff member and as such, staff members answered as individuals, irrespective of their FTE status. The online survey was completed by 79% of the 68% of all staff who agreed to take part in the research project.

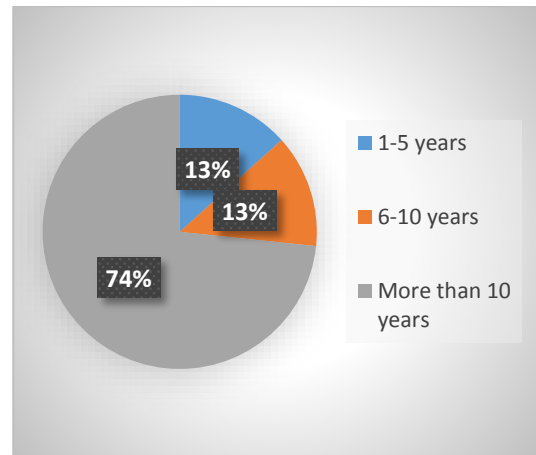
All staff participants but one agreed to be available for interview in addition to completing the survey. A sample of two staff from each subject area of English, mathematics and science were interviewed. One of these had been with the VSSSP for more than two years while the other had been at the VSSSP less than two years. This gave a maximum variation sample for KLA and time with the school. It was not possible to deliberately select staff from small or larger schools; however, all school population sizes were represented in the sample of staff selected.

#### **4.1.4 Demographic Data for Staff Participants**

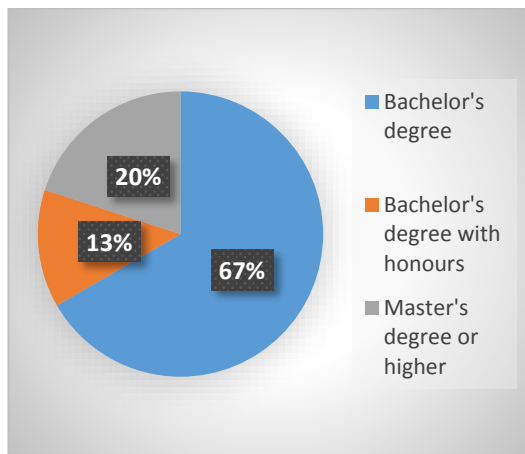
Demographic data for staff respondents are shown in Figures 4.5 to 4.8. The length of time the teachers had been working in the VSSSP is shown in Figure 4.6. Teacher education level, years of teaching experience and key learning area of teaching in the VSSSP are shown in Figures 4.7, 4.8 and 4.9 respectively.



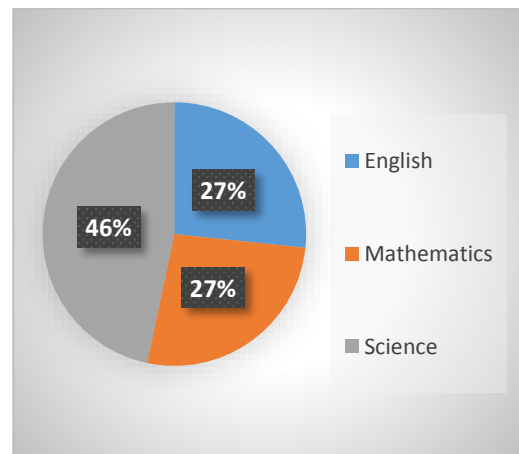
*Figure 4.5* Length of time staff had been involved with the VSSSP.



*Figure 4.7* VSSSP staff teaching experience.



*Figure 4.6* Education level of staff survey respondents.



*Figure 4.8* Distribution of respondents' Key Learning Area.

The majority of staff who participated in the research (60%) had been working at the VSSSP for more than 12 months. Staff who had been with the VSSSP from inception represented 13% of the total respondents. One third (33%) of staff had either a bachelor's degree with honours or a master's degree or higher, with the remaining 67% having a bachelor's degree. A high majority of staff (74%) had more than 10 years' teaching experience with a further 13% having 6–10 years teaching experience. Only 13% of staff participants had been in the teaching profession for less than five years. Nearly half of the staff respondents (46%) taught science in the

VSSSP, with just over one quarter (27%) each being part of the mathematics and English KLAs.

The mixed-methods research results will be presented in several sections. First, the survey results and interview findings will be presented along with the themes that were identified through the literature review and which formed the research model. These themes are the sense of belonging or isolation the staff member felt, the nature of the staff member, the staff perception of quality teaching in the VSSSP, the staff members' affinity with and use of technology, the development of 21st-century skills in the VSSSP and, finally, the transferability of the VSSSP skills into the staff members' mainstream classes at their local school. A further analysis of the perceived value of the VSSSP to the staff will be shown with regard to instructional practice, subject content knowledge and assessment practices.

#### **4.1.5 Methods Used to Analyse the Data Collected from All Surveys**

In the first instance, the entire survey offered to respondents was analysed using the Rasch Model of Item Response Theory. The results of this analysis are shown in Appendix G. The purpose of using the Rasch model was to confirm construct validity or not, of the survey instrument as a whole. The survey questions were then divided into themes and each theme was also analysed using the Rasch Model of Item Response Theory to check the construct validity of the instrument as used to gather information for that theme.

Applying the Rasch Model of Item Response Theory determined that the infit mean square for all questions in a rating-scale survey fell between the acceptable parameters of 0.6 and 1.4 (Wright & Linacre, 1994) indicating that the data have not varied from the Rasch model-derived expected range of responses. An overfit of the

data ( $<0.6$ ) would have suggested that the survey was leading the respondents to answer in a particular manner, while an underfit of the data ( $>1.4$ ) would have suggested that respondents were guessing answers. Guessing answers could lead to the collection of a meaningless set of random responses. By nestling into the centre of the Rasch model infit mean-square analysis as can be seen Appendix G, the survey responses can be considered indicative of genuine answers by the respondents; that is, there is sufficient variation in the responses that reflects the expected variation in a normal population.

## **4.2 Results from Student and Parent Participants**

The mixed-methods research results will be presented in several sections. First, the survey results and interview findings will be presented using the themes that were identified through the literature review. Student perceptions will be corroborated, or not, by parent surveys and interviews to provide further evidence that no Hawthorne effect is present.

The survey has been divided into themes for this descriptive analysis. The themes that will be described in detail are:

- 4.2.1 belonging/isolation
- 4.2.2 the nature of the student
- 4.2.3 quality teaching
- 4.2.4 creativity
- 4.2.5 21st-century skills development of the student
- 4.2.6 the perceived value of the provision.

### **4.2.1 Belonging/Isolation**

The survey questions offered to students to investigate the theme of sense of belonging or isolation are shown in Table 4.6.



Table 4.6

*Survey Questions in the Theme Sense of Belonging*


---

1.1	I feel isolated in the VSSSP.
1.2	I have found friends readily in the VSSSP.
1.3	I communicate with VSSSP students from other schools regularly outside my virtual class lesson times.
1.4	I enjoy being able to meet other talented students.
1.5	I feel that I belong in the VSSSP.
1.6	I am or have been bullied or harassed by people in the VSSSP.
1.7	Other VSSSP students are not like me.
1.8	I enjoy being part of the VSSSP.

---

The vast majority of student respondents (96%) agreed that they enjoyed being part of the VSSSP, 56% said they did not feel isolated by being in the VSSSP and 86% reported they liked to meet other talented students, with 61% agreeing they communicated with students from other schools who were also part of the VSSSP on a regular basis outside of virtual lesson times. Twenty-one per cent of students responded that other students in the VSSSP were not like them and 2% (or one student) reported they had been bullied or harassed by other students in the VSSSP. In contrast, 12% (or six students) had been bullied or harassed by students at their local school for being part of the VSSSP. Most (86%) of the students stated they had found friends readily in the VSSSP, with 82% reporting they felt as if they belonged in the provision. Student extended responses that aligned with this theme and were positive include the following.

- Being in the VSSSP has made me more confident, but when I go to a normal classroom it is harder to get along with friends there as I am away from them so often. This is good for learning, but not friendships.

- The VSSSP is an amazing concept and has been really effective with what it has aimed to achieve and I love that I am a part of it.
- The VSSSP has been the best thing that has ever happened to me as far as school is concerned. I watch my friends struggle through surds and do basic topics in English (they spent a term and a half on storyboards last year) and I know that I couldn't have handled it if I was in that position. The VSSSP has changed my life.
- Without the VSSSP I would have most definitely gone to a boarding school in Sydney and lost the incredible opportunities I have in my home town.
- The VSSSP is an excellent educational program. It has truly made an everlasting impact on my life. I attended Year 7 at my local high school, and was not as engaged because I found the work easy. The VSSSP pushed my limits and extended my boundaries. It made me work hard, which I feel is an absolutely essential practice for anyone looking to achieve highly in life. I would highly recommend it to students who enjoy challenging themselves.
- The VSSSP is a fantastic program. It remains important to me and I have retained a close relationship to many fellow VSSSP colleagues both from other towns and other year groups in my town. It has helped me greatly in establishing myself as a confident, intelligent, respectful and respected individual. It has helped my education to a large degree, but what I value most from the VSSSP is the experience.
- The VSSSP is an amazing opportunity and I am certain that I would only be half as excited about going to high school as I am now if I wasn't in the program.

- I have made so many friends over the few years I have been in the VSSSP and that makes residential camp a great place to be.
- I really enjoy the VSSSP and I think it has definitely helped me improve in my learning and extend my knowledge further. I have learnt many new skills and have consistently been challenged throughout my experience. It is also wonderful to meet new and life-long friends from all around the western region.
- The VSSSP is better than doing mainstream classes.
- I sometimes wish the residentials went for a little longer, I always enjoy those a lot.
- I enjoy the quietness of working alone or with just a few other students, I can't stand the noise and smells of normal classes as I am hypersensitive to those kinds of things, so I really enjoy the independent learning for once, without outside distractions.
- The VSSSP is an amazing program. I'm extremely glad to be a part of it because it isn't just a boring learning environment. The people in the VSSSP, teachers and students, are more supportive and helpful than most of the teachers and students at my home school. In the VSSSP, not only is our education being furthered, we are also building strong friendships with our peers and teachers. We're a small virtual high school, but we are a family.
- I have also made many new friends that are at the same, if not higher, intellectual level as me and it is good to know that there is someone else in your position.

- I believe that we should have more residential schools, or that one every semester should be a full week long, this would allow us to get to know our teachers better, as well as have fun with our peers.

One slightly negative response was recorded for this theme and is reported as follows.

- I enjoy the VSSSP, but sometimes I feel that if I wasn't a part of it that school would be far easier.

To corroborate student responses, parents were asked similar questions. Most (70%) parents reported their child had found friends readily in the VSSSP. Two per cent (or one parent responder) stated their child had been bullied or harassed by someone in the VSSSP in contrast to 13% who reported their child had been bullied or harassed by someone at their local school for being part of the VSSSP. In extended-response answers parents reported:

- [Student name] absolutely loved residential camps, and enjoyed being with children of a similar intellectual standard.
- [Student name] has loved the residential schools; frequently speaks of things they have done in virtual lessons; enjoys working with the other VSSSP students.
- My child loves being with like-minded children at the residential camps. Many great friends have been made.
- The ability to mix with a large number of like minds encourages amplification of the individual's abilities.
- To be placed in a cohort that has similar if not more needs for extended learning is fantastic. Suddenly, where they have been previously a high

achiever in a local class, they are exposed to others that are high achievers. I believe that this is a great reality check for my daughter.

- Our family is eternally grateful that this opportunity has been offered in our community. Without this exposure to other students that are extending themselves, I believe that my child would have missed out on a lot of awareness of what other talented students are capable of.

In summary, parent and student responses aligned with each other and were very positive about the sense of belonging felt by the students who were part of the VSSSP. Only one negative response was recorded about bullying in each of the parent and student surveys and no negative extended responses by parents were found in this theme. One ambivalent response from a student stated that friendship groups might be easier if they were not involved with the VSSSP.

#### **4.2.2 The Nature of the Student**

The survey aimed to elicit the nature of the student and to see if there were any commonalties between the students in the VSSSP. The survey questions relating to this theme are shown in Table 4.7

Table 4.7

*Survey Questions on the Nature of the Student*


---

2.1	My ability to manage unexpected events before I joined the VSSSP was excellent.
2.2	The virtual classroom environment suits me better than a regular classroom environment.
2.3	I really do not like the virtual classroom environment.
2.4	I am a very organised person.
2.5	I take part in many extra-curricular activities such as music, sport or debating.
2.6	I would describe myself as a motivated student.
2.7	I work well without close supervision.
2.8	It is important to have a balance between physical activity, school work and family time.

---

The majority of students (70%) stated they were able to manage unexpected events well prior to commencing study with the VSSSP. Most (76%) also felt that the virtual classroom suited them well, with 11% reporting that they “really did not like” the virtual classroom environment. Almost half (47%) of the students agreed they were organised, with 25% disagreeing with this statement. Just over one quarter (28%) neither agreed nor disagreed that they were an organised person while 74% described themselves as a motivated student and 77% agreed that they worked well without close supervision. Finally, 91% of students agreed with the statement that a balanced lifestyle was important, with 84% reporting that they took part in a wide variety of extra-curricular activities.

The majority of parents (63%) stated their child was able to manage unexpected events well prior to commencing study with the VSSSP, while 80% reported their child enjoyed the virtual classroom, with 97% of parent respondents reporting they were happy for their child to be part of the virtual secondary school

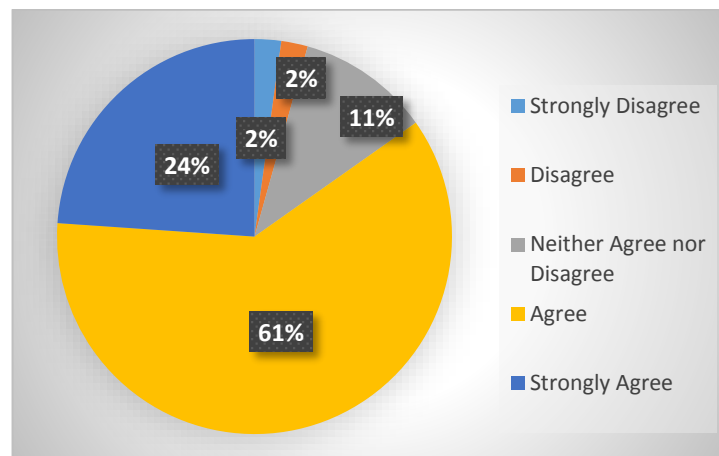
provision. Most (70%) of parents agreed their child was an organised person, with 17% disagreeing with this statement. Lastly, 87% of parents described their child as being a motivated student, and 87% agreed that their child worked well without close supervision.

As described in Chapter 1 the model for the VSSSP was a low supervision model. The inherent traits of the participating students to be motivated students, who work well without close supervision, were very important personal characteristics. Parents commented on these personal traits in their survey and the topic was further expanded by parents in the extended-response question “What advice would you give prospective parents if they were considering the VSSSP for their child?”. Parent responses include:

- The child needs to be extremely self-motivated and able to manage their time effectively and to work on their own.
- The VSSSP is not for everyone, and some children do not have the necessary maturity to cope with such an independent style of learning. These children go from Year 6 at primary school, to secondary school and learning in the VSSSP—it is a BIG change, some don’t cope.
- Their child needs to be a strong independent learner to cope successfully in this learning environment.
- Great program for the appropriate child, does not suit everyone.
- It is good thing for organised self-motivated students with high ability in all areas.
- I would recommend it to anyone whose child is keen to learn.

- The only good candidates for the VSSSP are students with an excellent work ethic and organisational skills, which is far more important than raw academic ability.
- Parents need to be very honest when considering their child's ability to learn independently. If a child is not highly motivated I believe they will not thrive in this environment.
- It is really hard especially in the first 12 months but now being in Year 10 I can see the benefits flowing through to a lot of areas in my child's life not just his school work. In my opinion it is worth persevering.

Finally, parents were asked to report on their family's affinity with technology. The aim of this question was to see if students came from families who were heavy users of technology in general. Results are shown in Figure 4.9 and indicate that 85% of parent respondents thought their family enjoyed using technology in general.



*Figure 4.9* Parent responses to the statement “Our family enjoys using technology in general”.

In summary, parent responses agreed with or supported student responses. Both participant groups agreed that inherent motivation and the capacity to work in a low supervision environment were important student characteristics in the VSSSP.



Importantly, parents expanded on the fact that the virtual environment only suits some types of students, regardless of their academic ability. The students came from families that had an overwhelming affinity with technology in their everyday lives.

### 4.2.3 Quality Teaching

The survey questions investigating the theme of quality teaching are shown in Table 4.8.

Table 4.8

#### *Survey Questions on the Theme of Quality Teaching*

---

3.1	The weekly work in the VSSSP is challenging.
3.2	The assessment tasks in the VSSSP are challenging.
3.3	In general I find the pace of work in my VSSSP classes to be the right pace for me.
3.4	I always know what is expected of me in a VSSSP assessment task.
3.5	Not being able to see the teacher physically during lessons is a limitation.
3.6	The VSSSP Moodle site is well organised.
3.7	My teachers in the VSSSP know me well as a person.
3.8	My VSSSP teachers really know their subject material.
3.9	I never get to say anything in a virtual lesson because the teacher ignores me.
3.10	The necessary timetable changes in the VSSSP interrupt my learning.
3.11	Virtual lessons should go for a longer time.
3.12	My teachers are always well prepared for virtual lessons.

---

Of the student respondents, 63% agreed that the regular weekly work in the VSSSP was challenging and 4% disagreed with this statement. The majority (85%) of students agreed with the statement that the assessment tasks offered by the VSSSP were challenging, with 0% disagreeing with this statement. Further, 76% of students found the pace of work to be right for them, with 6% disagreeing with this statement. Most (87%) of the students agreed that they understood what was expected of them

in assessment tasks and 73% of students agreed that the VSSSP digital learning management system was well organised, allowing them to find their work easily. Two per cent of the students reported that they found it difficult to find their allocated work in the digital learning management system. Most (93%) of the students disagreed with the statement that their teachers were hard to communicate with in the virtual environment, 84% of students agreed that their teachers in the VSSSP knew them well as a person, and 79% agreed that they felt comfortable talking to the VSSSP teachers about anything. Roughly, one third (33%) of the students agreed that the necessary timetable changes within the VSSSP interrupted their learning, with 30% agreeing that the virtual lessons should go for longer than they currently did. More than half (65%) of the students agreed that their teachers in the VSSSP were well prepared for their virtual synchronous lessons and 100% of students agreed that the teachers in the virtual secondary school provision knew their subject material very well. Almost all (98%) of the students disagreed with the statement that they never got to say anything because their teacher ignored them and 44% of students agreed that not having the teacher physically in the room during lessons was a limitation.

To corroborate student responses, parents were asked similar questions. Most (93%) of the parents agreed that the teachers in the VSSSP genuinely knew their child, 44% of parents stated they sat with their child to discuss materials on the digital learning management system sometimes and 17% said they discussed learning materials with their child most of the time. In addition, 93% of the parents said they found the teachers in the VSSSP approachable and 78% agreed that they could contact the teacher via email at any time. Over half (57%) of the parents agreed that they felt informed about what happened at the VSSSP on a daily basis and 97% of

parents agreed that there was a high level of challenge in the weekly work completed by the students in the VSSSP. Two per cent of the parents thought the weekly work was too difficult for their child and 93% of parents agreed they had seen their child complete challenging assessment tasks for the VSSSP. All (100%) of the parent respondents agreed that the teachers in the VSSSP knew their subject material very well. Parents were evenly split over whether the synchronous virtual lesson was too short – 20% agreed while 22% disagreed. A small proportion (13%) of the parent respondents agreed that their child sometimes seemed not to know what they were meant to be doing to complete weekly work in the VSSSP. Regarding the necessary timetable changes in the VSSSP, 20% of the parents agreed that these affected the learning of their child; 48% disagreed with this statement.

Parents were invited to provide extended responses to share any positive comments about the VSSSP their child had discussed with them. Relevant extended responses for quality teaching include:

- [Student name] has said that if she were to go back to mainstream at this stage she would be extremely bored and unchallenged.
- Does enjoy the challenges.
- My child loves the residential school and personal interaction with teachers. Work is stimulating.
- My child disliked Maths mainly, I believe, because she didn't understand it. Since being in the VSSSP, she enjoys the subject and is now very good at it as she has been taught to understand it by her VSSSP teachers.
- She enjoys the work and finds most of it interesting. She really liked making a short horror film this term (trailer for a narrative in English).

- My child has always been very appreciative of the opportunity to work at own pace and not have to sit in a classroom setting, this has definitely improved enthusiasm for learning!
- He knows the work is challenging but understands the concept behind making it this way.

Parents were also invited to provide extended responses to share any negative comments in regard to the quality teaching theme in the VSSSP their child had discussed with them. Relevant extended responses for the quality teaching theme include:

- She often gets frustrated by things that won't upload to the digital learning management system and I have had reports a few times from her teachers saying that she has not submitted work that she has actually submitted. She still sometimes feels overwhelmed by the amount of work she has to complete each week.
- During his first year in the VSSSP, [student name] was working by himself for all of Year 7. He found this very challenging. For a 13-year old to be by himself for about half of his school day was hard—he was very lonely, and tended to spend some of his VSSSP time doing things he shouldn't—computer games, daydreaming etc. Then he'd come home and do his VSSSP school work for home work, and he'd be up till all hours to catch up!!!
- High workload especially first 6 months.
- [Student name] says that the synchronous lessons are not long enough. There are lots of reasons why they might be cancelled or cut short, so she is concerned that she is not getting enough minutes per week of teaching time.

Also, the science practicals for Year 8 [school name] have been very disorganised this year so they are two prac classes behind.

- It's very hard. He dislikes residential school.

#### 4.2.4 Creativity

Creativity as it relates to innovative thinking was identified in the literature review as an area of interest. Table 4.9 shows the survey questions related to the theme of Creativity.

Table 4.9

##### *Survey Questions on the Theme of Creativity*

---

4.1	Being in the VSSSP supports my creative side.
4.2	It is hard to do anything differently in the VSSSP, things are always very rigid.
4.3	I have many ideas about new and different ways to do things.
4.4	I can express my ideas for new and different ways to do things in the VSSSP.

---

More than half of the student respondents (57%) reported that the VSSSP supported their creative side. Just over half (55%) of the student respondents disagreed with the statement that the VSSSP was a very rigid provision in which it was hard to do things differently, while 67% felt they had many ideas about new and different ways to do things and 57% felt they could express their ideas about new and different ways of doing things in the VSSSP. Students were given an opportunity to give an extended response to several of the questions. One question was an invitation to expand on any ways being involved with the VSSSP may have made one a better student at their local school. One student responded that “the VSSSP has made me better at thinking outside the box in terms of both answering questions in class and solving problems outside of class”.

Parents were asked to comment on the schoolwork they had seen their child complete as part of the VSSSP. Extended responses included statements such as:

- Some of the assessment tasks required my child to think outside the box and be more creative.
- There was a combination of high level learning and computer literacy at an innovative level.

Almost all (96%) of the parents agreed with the statement that the VSSSP provided unique learning opportunities for their child.

#### 4.2.5 21st-Century Skills Development

Questions in the student survey that were designed to uncover 21st-century skills development include the questions shown in Table 4.10. (Note: Question 5.4 is the same question as Question 1.1. The same student response data have been used here.)

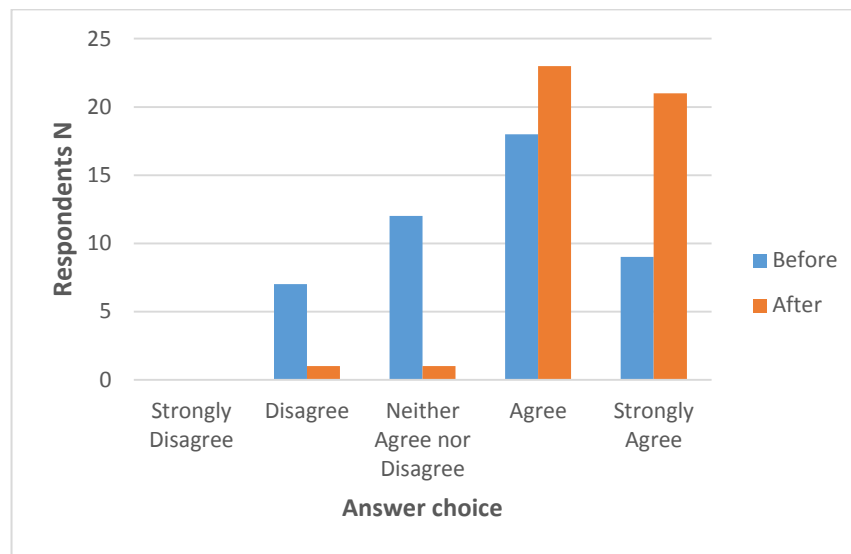
Table 4.10

##### *Survey Questions on the Theme of 21st-century Skill Development*

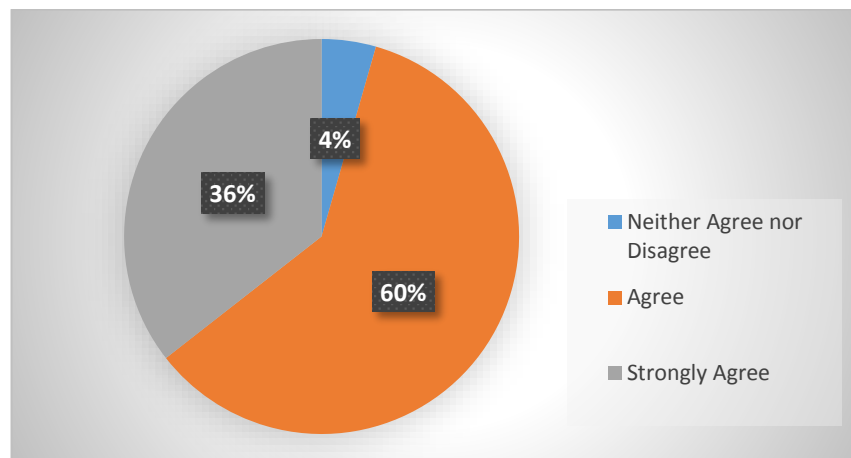
5.1	My skill level with respect to technology in general, prior to commencing the VSSSP was excellent.
5.2	My skill level with respect to technology in general now is excellent.
5.3	The VSSSP has helped develop my digital presentation skills significantly.
5.4	My ability to manage unexpected events before I joined the VSSSP was excellent.
5.5	My ability to manage unexpected events now is excellent.
5.6	Since I have been in the VSSSP my time management skills have improved

Figure 4.10 shows the development in technology skills, Figure 4.11 elucidates how students describe the growth in their digital presentation skills and Figure 4.12 displays the developing adaptability of students over time. Time-

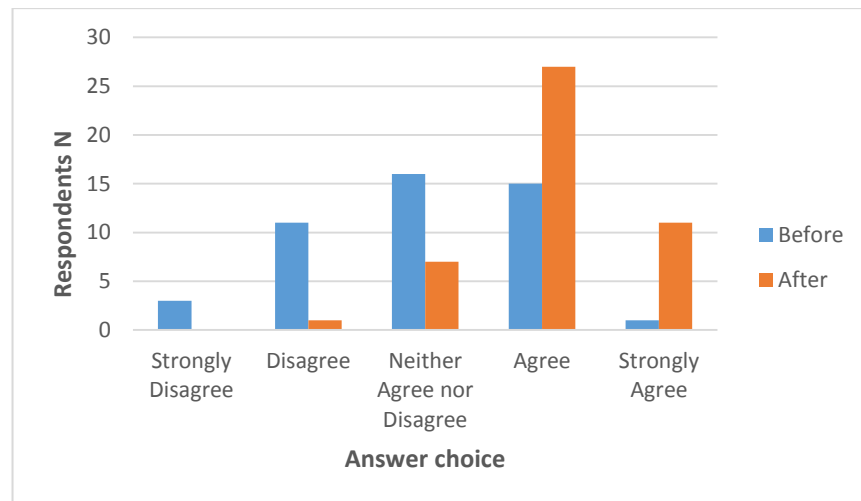
management skills address the first three 21st-century skills mentioned, and student responses can be seen in Figure 4.13.



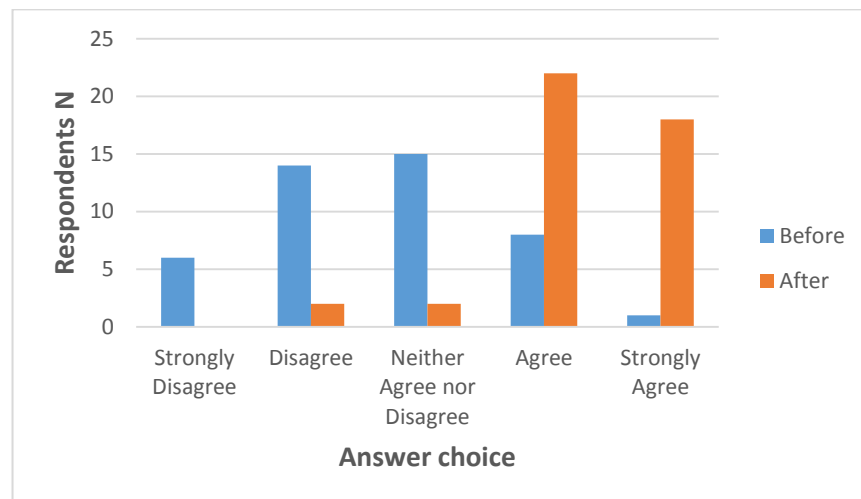
*Figure 4.10* Development in technology skills, as reported by students before and after involvement with the VSSSP.



*Figure 4.11* Student agreement results for the statement “The VSSSP has helped develop my digital presentation skills significantly”.



*Figure 4.12* Student survey responses to questions about their ability to manage unexpected events well before and after involvement with the VSSSP.

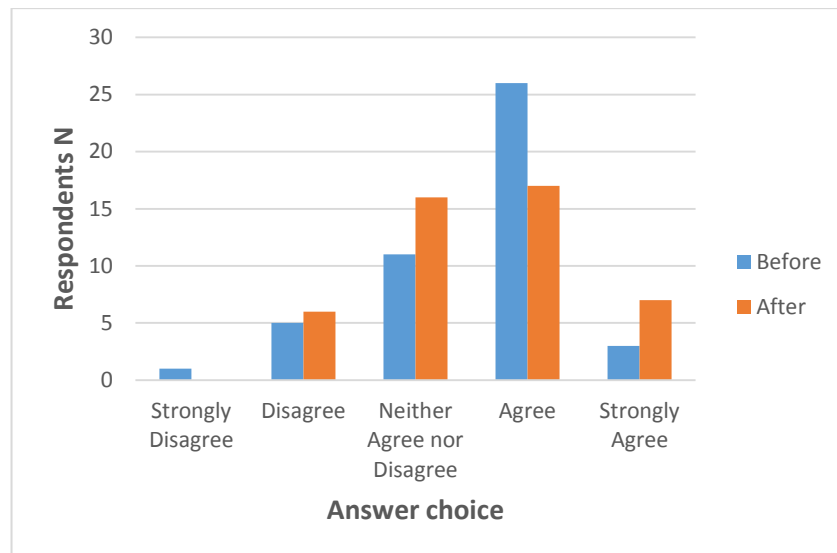


*Figure 4.13* Student survey responses to questions about their ability to manage their time effectively before and after involvement with the VSSSP.

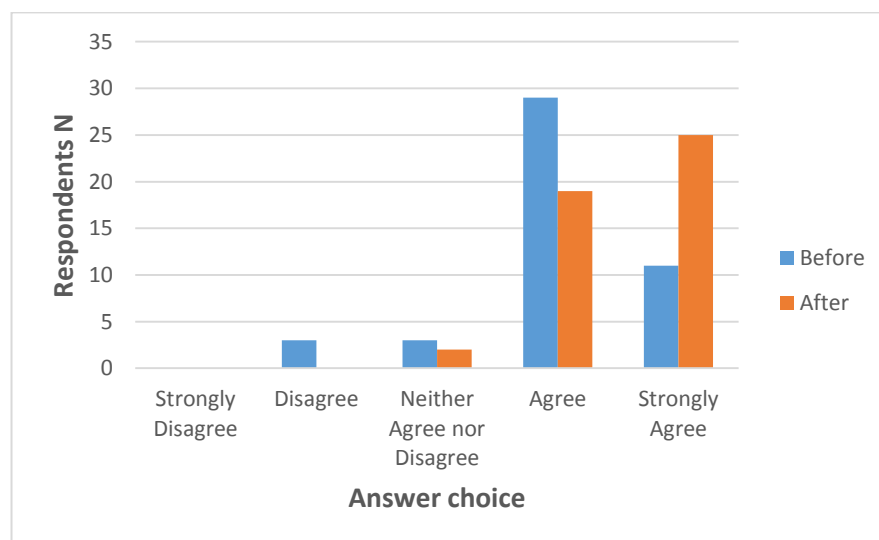
Parents were asked similar questions to corroborate the student responses.

Their answers are detailed in Figures 4.14 to 4.16.

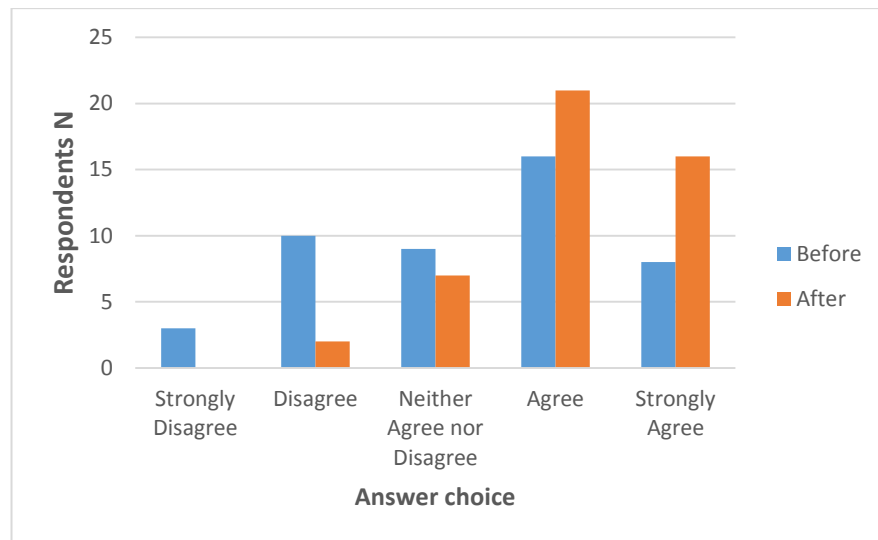




*Figure 4.14* Parent survey responses to questions about their child's ability to manage unexpected events before and after involvement with the VSSSP.



*Figure 4.15* Parent survey responses to questions about the development of technology skills by students before and after involvement with the VSSSP.



*Figure 4.16* Parent survey response to questions about their child's effective time-management skills before and after involvement with the VSSSP.

The parent survey responses corroborate the perception of the students in all areas. Positive extended responses from parents that were coded into the theme 21st-century skills are shown below with negative responses by parents referring to technology availability and reliability, not the use of technology as a teaching tool:

- She is not as tech savvy as most of the students and does not enjoy the technological side of it and has at times found this part of the VSSSP challenging (and unfortunately there is no-one in the family who can help her). She often gets frustrated by things that won't upload [to the digital learning management system].
- Technology difficulties cause problems.
- The shortfalls of technology and availability of internet connections are sometimes a problem given our remote location, in that synchronous lessons may be missed if the internet is down, not just from my child's end but the teacher's end.

- The delivery system of all the work is amazing, and enables [student name] to be so far ahead as far as IT [information technology] goes.
- Positive use of technology - e.g. not just Facebook.
- The chance to expand ICT [information communication technology] skills.
- Using technology for assessments.

#### 4.2.6 The Perceived Value of the Virtual Secondary

##### School Provision for Students

Survey questions for student responders for this theme are shown in Table 4.11. Question 6.3 was designed to ensure student responders were not simply choosing answers at random but were reading the questions; Question 6.3 is in direct opposition to Question 6.2.

Table 4.11

##### *Survey Questions on the Theme of the Value of the Provision*

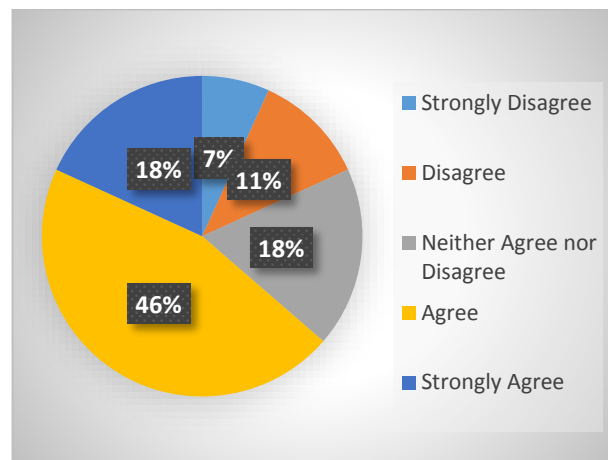
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6.1	The VSSSP is a very flexible school provision.
6.2	Residential school is an essential and integral part of the virtual secondary school environment.
6.3	Residential school is not necessary.
6.4	If I was not in the VSSSP I would not attend my local secondary school.
6.5	Technology skills will be useful in the future workplace.
6.6	I would recommend the VSSSP to other talented students.

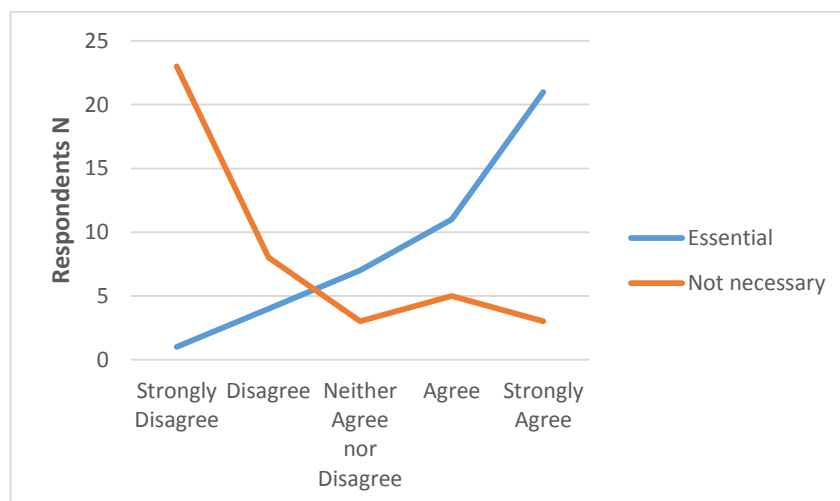
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Responses from students are shown in the following figures. Figure 4.17 shows student perception of the flexibility of the VSSSP, Figure 4.18 elucidates responses to both Questions 6.2 and 6.3 regarding residential school. These two questions were designed as a check to ensure participants were not simply choosing the same response all the way through the survey. Figure 4.19 shows future thinking by the students. Of the students, 19% agreed that if the VSSSP provision did not

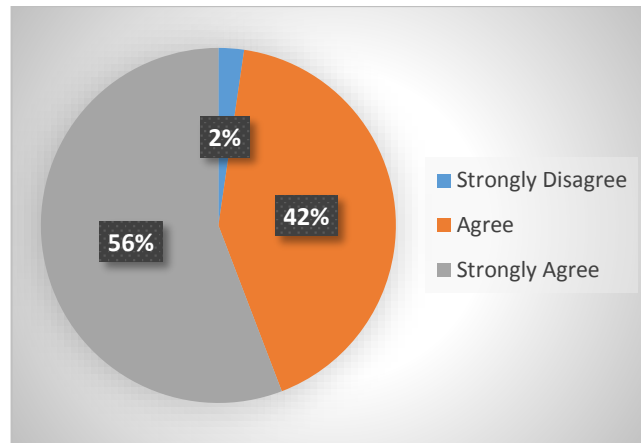
exist, they would not be attending their local secondary school and 88% of students agreed that they would recommend the VSSSP to other talented students.



*Figure 4.17* Student responses to the statement "The VSSSP is a very flexible school provision".



*Figure 4.18* Student responses to the statements "Residential school is not necessary" and "Residential school is an essential and integral part of the virtual secondary school environment".



*Figure 4.19* Student responses to the statement “Technology skills will be useful in the future workplace”.

Student responses to the survey question regarding their ongoing attendance at the local secondary school if there was no VSSSP, were mixed. The majority of students (67%) either disagreed or strongly disagreed with the statement “If there was no VSSSP I would not attend my local secondary school”, whilst 18% strongly agreed or agreed with the statement. The remaining 15% of students neither agreed nor disagreed with the statement. Parent responses differed from the student responses. All parents (100%) agreed or strongly agreed that there was a need for a dedicated educational provision for gifted and talented students in rural, regional and remote areas. In addition 95% of parents agreed or strongly agreed that the current VSSSP offered unique learning opportunities for their child. In extended responses parents reported that the “VSSSP offered a viable alternative instead of sending them away to boarding school”. Parents also commented that the VSSSP “benefitted the whole school as it retained the bright kids who may choose to go elsewhere”.

Another parent added the extended response that “we are very grateful that the virtual selective school has allowed us to give our son the opportunity to excel in his school work so he could realise his potential and to keep him with us in our town as family is very important to us and we would not have sent him away to school to

achieve this”. Almost half of parent respondents (49%) agreed or strongly agreed that they better understood their talented child after they had been with the VSSSP. The next section of results will rely on the adaptation of a method to assess value as presented by Manwaring (2013).

#### **4.2.6(i) Perceived value regarding development of academic risk-taking**

Students were given the opportunity for several extended responses. The first of these was “Please outline any way(s) that the VSSSP may have helped you to take some risks with your learning”.

Student responses included:

- It has definitely helped me take risks regarding my learning as I was not sure how I would be able to cope. I have also been taught in classes to think outside the box which therefore leads me to taking more risky approaches to my current assessment tasks and weekly work.
- The VSSSP has helped me in taking risks when doing assignments and I now use more advanced technology and programs.
- The VSSSP has helped me take risks in the sense that I take control of my own learning. I have developed skills in which I can manage when I do my work and I have to kind of teach myself too so it sticks better in my mind.
- It has helped me become a more independent learner. It has made me more organised and more time efficient.
- As the VSSSP was only in its second year when I first joined, it was a risk to become involved in it. The program was new and many things were yet to be refined.

- The VSSSP has pushed me harder than I would have liked to go at times, but now I think that it is very good.
- It has taught me through the multiple assignments that are due in one week that there is always time for something (My record is 9 due over one week).
- The VSSSP has helped me learn at my own individual pace and not have to wait for all of a class to catch up, like in mainstream classes.
- It has taught me to manage my time independently much better than I ever thought I could in primary school, which I think will help me later on with university, which is essential for my future goals. It has also allowed me to be more sociable, before the VSSSP I would never have gone to a party or slept overnight outside my own or my grandparents' home.

#### **4.2.6(ii) Perceived value regarding increased engagement at school**

Students were given an opportunity to provide an extended response to the statement "Please outline any way(s) that the VSSSP may have made you more engaged at school". Positive student responses are:

- I engage more in lessons because of the VSSSP's positive learning environment. With other people around me I am encouraged to contribute more to lessons.
- Because the VSSSP is a different environment to my mainstream classes it makes mainstream classes more interesting as all of my classes are different.
- Through its own engaging and challenging way, it has made me value challenges at school and appreciate how they are beneficial.
- The virtual provision has made me able to give more in classes and have more facts in my head.

- The virtual provision has helped me be more engaged because I like work.
- I have to be more independent in the VSSSP so I have to engage more.
- The VSSSP has detracted a little from elective subjects as the work in elective subjects is a secondary concern.
- I am more engaged at school as I am interested in more things and what I have learnt in the virtual provision ties into normal school.
- The VSSSP has helped me to stay on task, because even though it is very easy to be distracted by the internet and various things I can do on this laptop, it is used for schoolwork, or I will be behind in work.
- Virtual lessons often give me a break from social interaction for a while, meaning I am less stressed and more focused on the next class.
- It has made me more interested in learning, because in primary school nothing ever challenged me, and now that I have challenges I enjoy lessons more.
- The VSSSP has made me more engaged by actually having something to look forward to at school each day. Knowing that you have the virtual provision work to complete and synchronous lessons you need to attend, gives you the motivation to go to school. It is also good to have your own time in the VSSSP and not be in a regular classroom with so many other students.
- Communicating virtually with your teacher isn't as easy as being with them in person. Since joining the VSSSP, I have been more aware and focussed [sic] throughout my local school classes.
- I tend to find that when I receive assignments at my local school, everyone else complains and says that it will take forever and is generally impossible. Most of these people will not put in a genuine effort and don't get it



completed because they don't think they have the ability to do it, and I used to do the same thing, but now I can look at an assignment sheet, completely understand it and get it done with ease.

- I have been more engaged because now I know how much it is possible to fit into one period.
- The self-discipline required by the virtual provision has helped me engage more in local school.
- Due to key aspects in synchronous lessons, the VSSSP has made me more attentive and pay more attention.
- It has furthered my knowledge, thus increasing my confidence when answering questions or doing work. It has assisted my social skills and helped me build stronger friendships. My motivation for learning has also increased.
- My local school teachers know that I am in the virtual provision and are capable of doing more so they go out of their way to extend me in normal classes and this makes me more engaged.
- I enjoy coming to school because in the virtual provision I know that I have many things to do, I'm not always asking myself what to do next. I also really enjoy learning virtually, although sometimes there are some interruptions.
- Because the virtual provision is a different environment to my mainstream classes it makes mainstream classes more interesting as all of my classes are different.
- The VSSSP has made it possible for me to extend myself once I have completed the base school work as this is often completed very quickly.

Two negative responses were recorded by students. Both these responses stated that there was no improvement in engagement:

- I don't think the virtual provision has improved me in this aspect.
- I don't believe that the VSSSP has made me more engaged at school. I think that I am still as engaged at school as I was before I started the VSSSP.

#### **4.2.6(iii) Perceived value regarding improvement in enabling skills**

Students were given an opportunity to provide an extended response to the statement "Please outline any way(s) that the VSSSP may have helped you be a better learner". Student responses were:

- It has helped me be independent in my learning and slightly more self-taught which will help me in later life. It has also improved my time management skills.
- It has helped me to be a better learner as I have learnt to contribute more during lessons. I have learnt to be more independent when doing my work.
- The VSSSP has helped me be a better learner because it pushes me to my limits rather than just coasting along.
- The VSSSP has made me more organised and has helped me manage time more efficiently. Therefore, I no longer leave assignments until the last minute and I usually have them completed a few days before they are due. Without the VSSSP, I don't know if I could have achieved this.
- The VSSSP took me to a higher plane of thinking and skills. It taught me the value of hard work, commitment and dedication.
- I think that it has helped me learn more independently and how to work quicker, be more organised.
- It has taught me the way to multitask effectively.

- The VSSSP helps me learn because I can learn at a faster pace than mainstream.
- It has helped me learn on my own, and at my own pace.
- The VSSSP teaches excellent organisation skills. It provided a structured learning vessel which seeped into my other subjects at school. I was able to use my time effectively to complete tasks in mainstream classes. The VSSSP has especially prepared me for Year 11; it was very busy and thus I learnt to cope with it.

Parent comments that spoke to this theme include the following:

- My child is not a bookworm, not solely focused on school work and he has many interests and is good at a lot of things he does. The VSSSP has taught him better time management and organisational skills that I don't know if he would have achieved without it.
- It has taught her time management, study skills and improved her level of learning in such that she is being challenged constantly to excel in learning and adapt to new experiences. Secondary school is a time of maturation and I believe this type of learning/teaching aids in that process.
- The virtual learning environment is very unique in that it balances the independence of learning with the close connections with teachers. I believe my child had a stronger bond with teachers through the VSSSP than in a regular classroom setting but was able to combine this with time management skills and self-discipline.
- The level of independence in learning was initially very daunting but the students I believe have adapted well to this advanced demand, they know that they are not "spoon fed" and their time management has improved.

#### **4.2.6(iv) Perceived value regarding transferability of skills to the local school classroom**

Students were given an opportunity to respond in an extended manner to the way in which (if at all) being in the VSSSP may have helped them in their local school classes. Positive student responses to the question “Please outline any way(s) that being in the VSSSP may have helped you complete assessment tasks in your mainstream classes” are:

- It has helped me in completing other assessment tasks as I now have access to my own computer.
- I was very advanced in History once, because what we were studying was stuff we had done as background work for [the novel] *Animal Farm*. When it came to the assessment task for History, I knew exactly what to do because of all that information I already had, information that other students had to go and look for. It was easy for me and I ended up getting an A.
- Doing assessments is much easier because I know how to do it independently.
- Being in the VSSSP, the assignments take a long time but now for any other written assignment, I can write 800 words in about 10 minutes including research time so I’m pretty happy with that. I believe it gives you good practice and time management.
- It has helped me by educating me beyond the expectation of the other classes, and by being organized.

Negative student responses were:

- The VSSSP has had little influence on my assessment tasks in my mainstream classes. The only difference may be that I am challenged as I am more pushed

for time with my other assessment tasks because the VSSSP assessment tasks are very time consuming.

- In no way has the VSSSP helped me complete other tasks. If anything it just takes up all of my time available to do the other tasks.

Students were also given an opportunity to provide an extended response to the statement “Please outline any way(s) that the VSSSP may have made you a better student in your local school classes”. Some responses repeated what students had said previously about being a better learner. Other responses that relate to the specific question of being a better student included:

- It has taught me to be more independent which helps me top my classes and prevents me from getting behind. It has also helped me when answering questions given in class as I have been taught a new way to approach things.
- It has helped me in contributing more during my local classes.
- I am more independent. I don’t need the teacher to explain things to me because I have learned how to understand it myself.
- Leaving the teachers in peace to help the other kids that need it.
- The VSSSP has taught me that it is ok to be different, and to exceed expectations, rather than do the bare minimum.
- The VSSSP has made me better at thinking outside the box in terms of both answering questions in class and solving problems outside of class.
- It has made me a more focused and independent person, which makes me a better student in my local classes.

#### **4.2.6(v) Perceived value of the continuation of the VSSSP**

The final question in the student survey was an opportunity to provide an extended response about anything at all. At the time of data collection the VSSSP, as

it had existed for five years, was to be closed. Many students did not respond in any way, but the responses of those who did are as follows:

- It was really hard in the beginning for me because I started in Year 8 and missed some of the basics and every now and then one of my teachers will bring it up and I'll have no idea because my local school was so far behind by this stage. But all in all, the VSSSP has been the best thing that has ever happened to me as far as school is concerned. I watch my friends struggle through surds [in mathematics] and do basic topics in English (they spent a term and a half on storyboards last year) and I know that I couldn't have handled it if I was in that position. It has changed my life.
- The VSSSP is an excellent educational program. It has truly made an everlasting impact on my life. I attended Year 7 at my local secondary school, and was not as engaged because I found the work easy. The VSSSP pushed my limits and extended my boundaries. It made me work hard, which I feel is an absolutely essential practice for anyone looking to achieve highly in life. I would highly recommend to students who enjoy challenging themselves. Students who take part in extra-curricular intellectual activities, such as debating, external competitions, such as the ICAS [International Competitions and Assessments for Schools] tests, and/or students who already take part in extra study groups, such as Opportunity Classes, will benefit immensely from the VSSSP.
- As a student who will be in the first year group to graduate from the VSSSP in Year 10, I am angry at the Department of Education and Training for not doing more to continue this wonderful program. I am disappointed because all decisions in regards to the future of the VSSSP were made without

collaborating with the students. Out of all the times in my life when I have been treated as an immature, dumb kid, this has been the most significant. The VSSSP students, who were in the program because they were bright, were seen merely as interchangeable by the government. This is yet another example of bureaucracies acting without consulting with the people who the actions will affect the most.

- Current VSSSP students should have the choice to continue in the VSSSP into Year 11 and 12. Students should be continually encouraged to extend their boundaries; by stopping the VSSSP in Year 10, students' opportunities to extend themselves are being cut short. This is not what Australia prides itself on.
- One of the key concepts of justice is equality. This is what the VSSSP aims to do; provide equal education for kids in the Western region of NSW when compared to schools in metropolitan areas. City kids have access to selective secondary schools right through to Year 12, so why not country kids? Of course, the way in which this selective secondary school is delivered is naturally going to be different due to obvious geographic factors. So what? The VSSSP is an innovative program that aims to bridge the gap and deliver high quality education despite any other factors. It has an aim to deliver outstanding education no matter the circumstances, and it addresses this aim effectively. The VSSSP is an amazing program. It is innovative and engaging. It should be encouraged and supported by the full power of the DEC to help achieve equality throughout the state. The VSSSP will develop bright people, leading to a brighter future of Australia. How could anyone refuse this?

Parents were given the same opportunity to provide an extended response about anything at all in the last question on their survey. Not every parent chose to provide a response but those who did respond wrote as reported below. All comments were positive about the parent perception of value of the provision:

- The VSSSP is definitely a valuable program and I feel that my child has come a long way since joining the program. She was really miserable and hated it for most of the first year she was in it and I gave her the option of dropping out at the end of that year but she decided to stay in the program as she felt she would not get as good an education in mainstream. Her second year in the program, she got the hang of it and performed extremely well in all her subjects. Her time management and maturity have increased greatly. She is in Year 10 this year and I am concerned about her going backwards when she finishes the program at the end of this year, so much so, that I am looking to send her to a different school next year. The program has definitely benefited her greatly.
- Being part of the VSSSP was like being part of an extended and dedicated family. The Management Team and all the Teachers were always helpful and listened to our worries and concerns. To see the transformation from a wary Year 7 boy to a confident and mature Year 10 boy, was inspiring, and as a parent, I have nothing but thanks and praise for the whole VSSSP team!  
[Student name] began the VSSSP as a guinea pig, and finishes in 2014 as a young man that loved the whole experience!
- Need to generate more local support and awareness of the VSSSP and what it offers, and how the program can tangibly benefit the school (e.g. improved NAPLAN results, retention of bright kids that may otherwise go elsewhere).



- The VSSSP has offered us, as parents, a viable alternative to sending our child to boarding school, for which we are truly grateful. The staff and other students attending the VSSSP offer a fun, friendly but challenging environment within which we feel that our child is thriving. What more could a parent want for their child.
- I'm not sure if my daughter should remain in the VSSSP next year when the work becomes more difficult in Year 9, as the synchronous lessons are much too short. At the moment I give her a lot of help with maths, but I will not be able to help her in Year 9 and beyond. Also, the homework load is excessive which is impacting negatively on her preparation for her Grade 8 AMEB [Australian Music Education Board] saxophone exam this year, plus she has had to drop sporting, swimming and athletic commitments due to the workload. However, it has been an excellent experience for her and I am glad she has done it.
- Thank you for providing this amazing experience for both my children, two very different children both enjoying the challenge.
- I only hope that the opportunity to continuing studying through to Year 12 in the VSSSP will be offered in the years to come.
- We have had some stressful moments and times when both he and I felt like pulling out of the program as it has caused some tension in the household especially in the early days. It is a fine line I guess between letting your children be kids and helping them to achieve their potential and my husband and I are very grateful that the virtual selective school has allowed us to give our son the opportunity to excel in his school work so he could realise his potential and to keep him with us in our town as family is very important to

us and we would not have sent him away to school to achieve this. Even though it is difficult at times the benefits outweigh this and I am sure that now he realises that the effort has been worth the result.

Parents were also given an opportunity to provide an extended response if they agreed with the statement that the VSSSP provided learning opportunities that were unique. Parent responses to the statement “Please expand on your answer to outline what learning opportunities you consider unique” are:

- Some of the assessment tasks have required artistic or musical talent or in depth technological ability and while this appeals to some of the students, not all of them are gifted in these areas (art and technology for my child) and this added undue stress and pressure to an already challenging assignment.
- Small virtual classrooms which enable a teacher to deal more effectively with each and every student’s needs, strengths and weaknesses.
- They learn early to be independent learners and they have to manage their time efficiently to keep up. They learn to seek out answers and assistance on their own. They only have three twenty-minute sessions with each teacher and the rest is up to them.
- I believe that this is a great reality check for my daughter as she now realises there are other students out there that are more talented or as talented that work hard to get where they want to be. I feel that she tended to “rest on her laurels” a bit before arriving in this environment of learning. She has learnt that if she wants to do well, she has to put in more than just a standard effort, she has to work hard! A great life skill!

There were no negative responses to this question.

## **4.3 Results from Staff Participants**

This section will report on the results from the staff survey and extend those results with data collected during face-to-face interviews during school visits with the VSSSP staff member or one of the Support Staff who acted as the link between the VSSSP and the local school.

The survey has been divided into themes for this descriptive analysis. As a reminder, these themes that will be described in detail are:

- 4.3.1 belonging/isolation
- 4.3.2 the nature of the teacher
- 4.3.3 quality teaching
- 4.3.4 creativity
- 4.3.5 21st-century skills development of the teacher
- 4.3.6 the value of the provision.

Section 4.3.7 will provide description of the interviews with partner school principals. Interviews with principals were a source of data to confirm or refute teacher data and to investigate if there was a different perspective at the leadership level in schools that may need further research at a later time.

### **4.3.1 Sense of Belonging or Isolation**

Teachers in rural and remote locations often work with a very small number of other staff (Halsey, 2005; Manwaring, 2013), and the sense of belonging or isolation can have an impact on staff. The survey questions that were identified as relating to the theme of belonging are shown in Table 4.12.

Table 4.12

*Survey Questions on the Theme of Sense of Belonging*


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1.1	I feel professionally isolated in the VSSSP.
1.2	I enjoy being part of the VSSSP.
1.3	I have found professional friends readily in the VSSSP.
1.4	I enjoy being able to meet like-minded teachers.
1.5	I enjoy the professional collaboration in the VSSSP.
1.6	I collaborate with people from other schools regularly, outside my virtual lesson times.
1.7	I am or have been bullied or harassed by people in the VSSSP.
1.8	I am or have been bullied or harassed by people in my local school for being part of the VSSSP.
1.9	My fellow teachers in the VSSSP know me well as a professional.

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Staff responses to the first six questions in this theme are shown in Figure 4.20. These results clearly show that the staff participants felt a sense of belonging in the VSSSP, and that there was a professional connection. In extended-response items in the survey, staff frequently mentioned the benefits of having a larger number of staff with whom to discuss professional issues. One staff member commented that their staffroom was now made up of more than 50 teachers, as each of the VSSSP staff had a local school KLA staff of approximately eight people and there were approximately nine staff teaching each KLA in the VSSSP. Each teacher in the VSSSP had the capacity to share professional conversations with everyone in their local school staffroom in addition to their KLA group in the VSSSP. This extended support was reported as invaluable to less experienced and/or more isolated staff in particular.

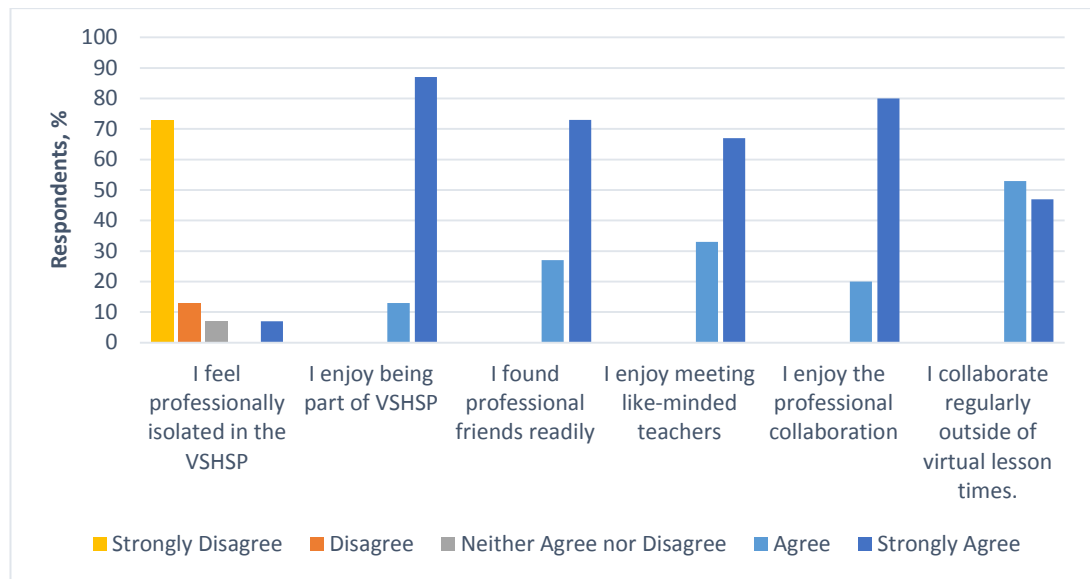


Figure 4.20 Staff responses to survey questions on the theme of sense of belonging.

Bullying of VSSSP teachers by other VSSSP or local school teachers was reported as being essentially absent. The responses to questions about bullying are shown in Figure 4.21. The vast majority of staff (93%) strongly disagreed that there was any form of bullying, with the remaining staff (7%) neither agreed nor disagreed with this statement.

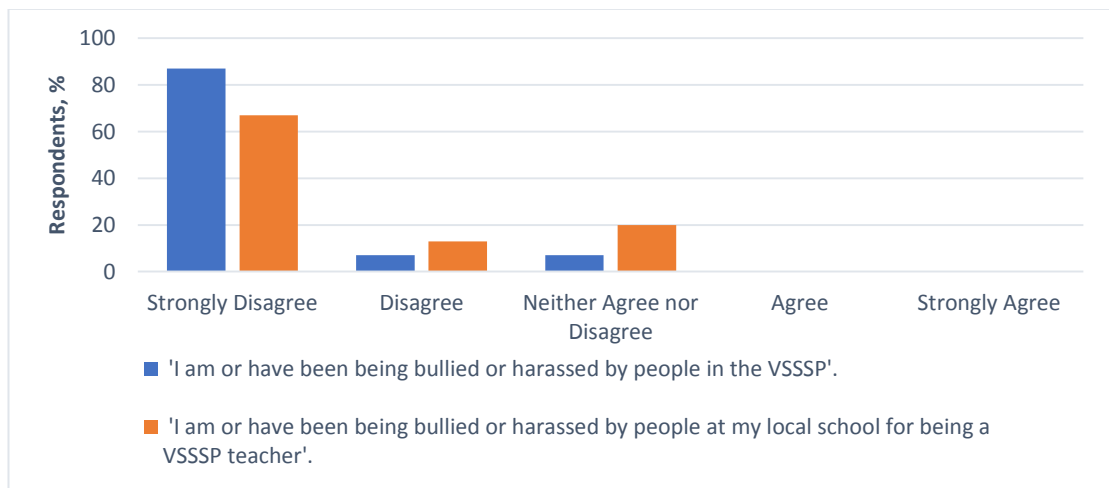


Figure 4.21 Staff responses to questions about bullying.

A large majority of staff (93%) reported that they felt the other teachers in the VSSSP knew them well as a professional. The remaining 7% of staff neither agreed nor disagreed with this statement.

### 4.3.2 The Nature of the Teacher

The survey aimed to elicit the nature of the staff member to see if there were any commonalties among the teachers in the VSSSP. Teachers of gifted students are widely described as having a large impact on the development and learning progress of gifted students (Chan, 2011). Survey questions that relate to this theme are shown in Table 4.13.

Table 4.13

*Survey Questions on the Nature of the Teacher Theme*

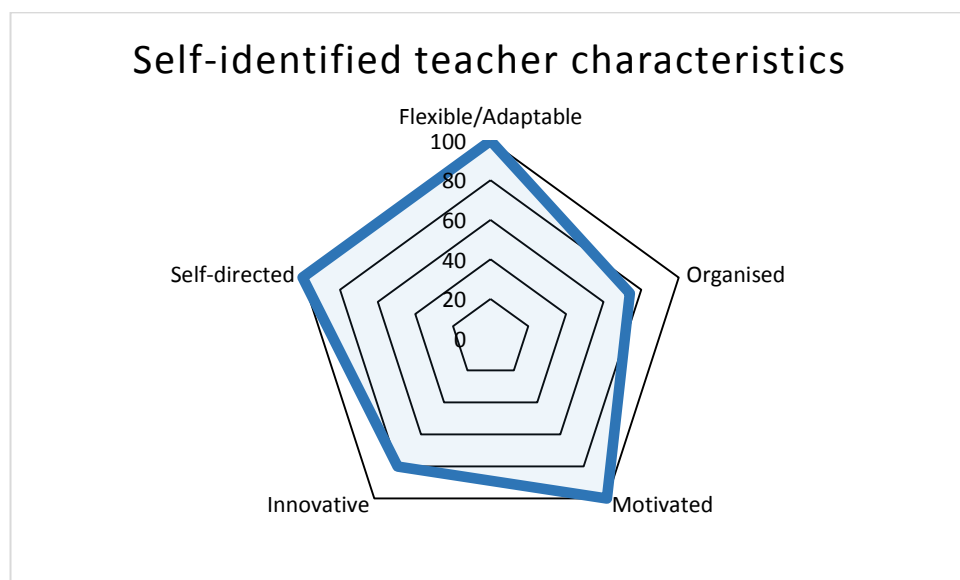
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2.1	My ability to manage unexpected teaching/learning issues before I joined the VSSSP was excellent.
2.2	I prefer teaching in the virtual classroom to the bricks and mortar classroom.
2.3	I am a very organised person.
2.4	My ability to teach talented students is about average.
2.5	I would describe myself as a motivated person.
2.6	I work well without close supervision.
2.7	It is important to have a balance between physical activity, school work and family time.

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Figure 4.22 elucidates how the nature of the individual teacher was similar across all staff respondents. A radar chart allows multivariate data to be displayed on the one set of axes, so allowing similarities across a number of variables to be compared. In Figure 4.22, the data demonstrate that the staff respondents were similar in many self-identified aspects that report on the nature of the teacher. Survey results revealed that the majority (80%) of staff agreed they were able to manage unexpected teaching and learning events well prior to commencing work with the VSSSP. This increased to 100% after they had worked with the VSSSP. These are shown in Figure 4.22 on the flexibility/adaptability axis. The majority (73%) of staff agreed they were an organised person, with only 7% disagreeing with this statement

(organisation axis). All staff described themselves as a motivated person (motivation axis) and all staff agreed that they worked well without close supervision—presented on the radar chart as the self-directed axis. A large majority (80%) of staff respondents agreed that they had innovative ideas for teaching and learning and this is shown on the innovative axis. The radar chart revealed a high degree of commonality among the staff respondents; no one variable was lower than the others by any large proportion, hence the area within the chart line is close to matching the area of the full chart. When one variable is significantly different, the area of the radar chart will look more like an ill-formed star, with one axis quite close to the centre of the graph.



*Figure 4.22* Percentage of staff who agree they have these identified personal characteristics.

The virtual classroom is a different environment to the mainstream classroom. Lessons are shorter in length, students and teachers may not be able to see each other, students and teachers are in a different physical space and the classroom dynamics are quite different in that a teacher cannot necessarily see what a student is doing or has done with their work. More than half (53%) of the staff agreed that they

preferred the virtual classroom to their mainstream classroom and 47% neither disagreed nor agreed with the statement. These responses depended on whether the teacher had other gifted and talented students at their school in their mainstream classes and this, in turn, depended on the school size. Those staff from smaller secondary schools who had little or no exposure to gifted and talented students at their local school reported that they preferred the virtual environment. Those staff who were ambivalent about classroom preference came from larger secondary schools and explained in extended responses in the survey that they had other students at their school who were gifted and talented, which, they reported, met their need to work with motivated and capable students. A majority of staff (73%) disagreed with the statement that they had average ability to teach gifted and talented students, while 20% agreed with the statement. All staff (100%) agreed with the statement that a balanced lifestyle was important.

To expand on the information provided by staff respondents, extended-response opportunities were provided in the survey. Relevant responses for this theme, the nature of the teacher, are:

- The VSSSP is any motivated teachers [sic] dream come true and the students provide a significant amount of that motivation.
- The VSSSP fulfils my need of teaching/learning to students who wish to do well and are constantly questioning and presenting new ideas.

### **4.3.3 Quality Teaching**

The survey questions relating to the theme of quality teaching, as defined in the application of the quality teaching dimensions of intellectual quality, significance and a quality learning environment (NSW DET, 2003), are shown in Table 4.14.



Table 4.14

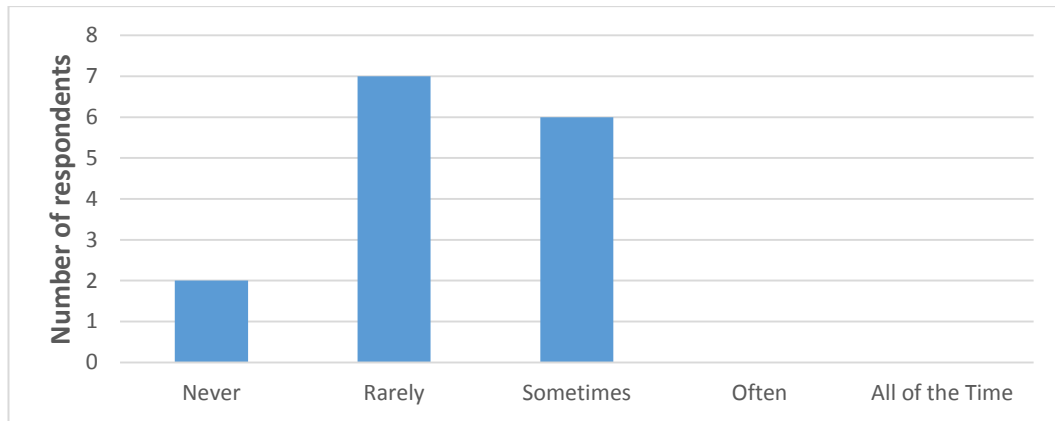
*Survey Questions on the Theme of Quality Teaching*


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3.1	I prepare a variety of challenging weekly work for my VSSSP classes.
3.2	I prepare a variety of challenging assessment tasks for my VSSSP classes.
3.3	I generate a clear marking guideline for VSSSP assessment tasks.
3.4	My VSSSP students submit most of their weekly work on time.
3.5	My VSSSP students make me feel welcome every lesson.
3.6	Virtual lessons should go for a longer time.
3.7	Virtual lessons are difficult to deliver well.
3.8	The necessary timetable changes in the VSSSP impact considerably on teaching and learning in the VSSSP.
3.9	My students are always well prepared for virtual lessons.
3.10	Not being able to see the students physically during virtual lessons is a limitation to teaching and learning.
3.11	VSSSP staff interactions are focused on teaching and learning.
3.12	My ability to manage unexpected teaching/learning-related issues before working in the VSSSP was excellent.
3.13	My ability to manage unexpected teaching/learning-related issues after working in the VSSSP is excellent.

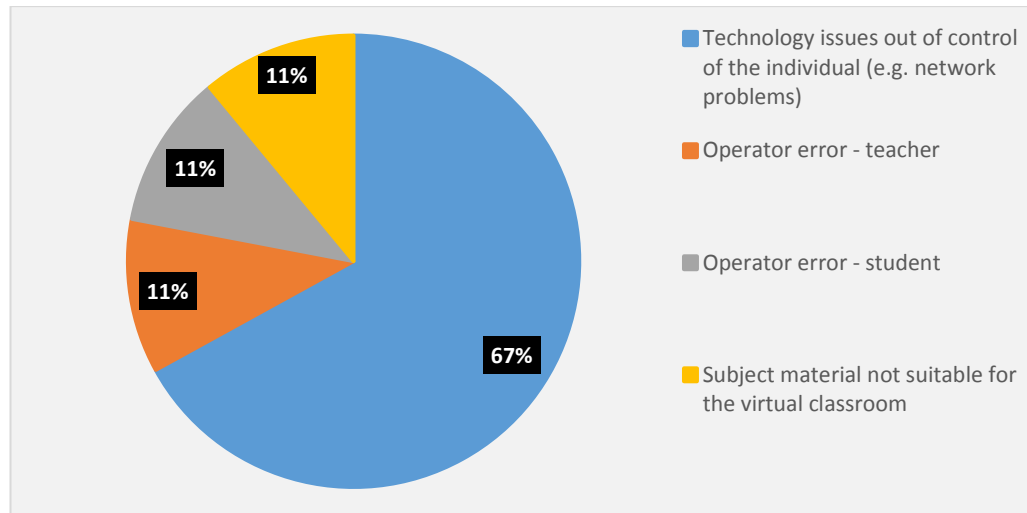
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All staff (100%) agreed they prepared a variety of challenging weekly work, assessment tasks and a clear marking guideline for their assessment tasks. A very large majority (97%) agreed that their students submitted their weekly work on time and 100% of staff agreed that their students made them feel welcome every lesson. Responses to the statement “Virtual lessons are difficult to deliver well” were mixed and the responses and a possible reason for the difficulty are shown in Figures 4.23 and 4.24, respectively. Figure 4.23 demonstrated that the majority of staff (60%) felt that virtual lessons were either never or rarely difficult to deliver well while 40% of respondents felt that virtual lessons were sometimes difficult to deliver well.



*Figure 4.23* Aggregated staff responses to the statement “Virtual lessons are difficult to deliver well”.

When offered an opportunity to expand on why virtual lessons might be difficult to deliver well, the majority (67%) of staff reported technology issues outside the control of the individual, such as network-connectivity issues, were the major source of problems. These issues included when the Internet service provider had an issue with part of the service supply chain. Equally important (11% each) were three other issues. Two of these issues were operator errors due to either the teacher or the student. The operator errors were reported to be around the familiarity and skill level of either the student or teacher with the web-conferencing software used in the VSSSP and were reportedly in the early part of the new school year as recorded in teacher interviews. The third reason why virtual lessons might have been difficult to deliver well was that the subject content was not well suited to the virtual lesson environment. Topics such as three-dimensional shapes in mathematics, dramatic performances in English and dissections in science were considered by staff as sometimes difficult to deliver well in a virtual lesson environment.



*Figure 4.24* Reasons provided for why a virtual lesson may not have been ideal.

The virtual lesson length in the VSSSP had been set at 25 minutes. A slight majority (54%) of staff identified that they neither agreed nor disagreed that virtual lessons should go for a longer time, while 20% agreed they should and 26% thought they should not. A majority of staff (60%) agreed that their students were always well prepared for their virtual lesson, with only 14% disagreeing with this statement. One third (33%) of staff agreed that not being able to see the students physically during lessons was a limitation but nearly half (47%) of staff disagreed with this statement. The regular changes to scheduled times for synchronous virtual lessons were seen as having a considerable impact on teaching and learning by 33% of staff respondents, of having little impact by 27% and of neither having an impact or not having an impact by 40% of staff respondents. Most staff (87%) agreed that staff interaction in the VSSSP was always concerned with teaching and learning and only 13% thought interaction was sometimes concerned with teaching and learning matters.

#### **4.3.4 Creativity**

Creative teachers and creativity in teachers is an expanding area of research. Chan (2011) reports that skills in creativity and problem-solving rated an average of

4.2 out of a possible 5, with a standard deviation of 0.96, for gifted-student perceptions of the desirable qualities of teachers (p. 163). This was the highest average score and the lowest standard deviation for all characteristics reported in Chan's work. Bramwell, Reilly, Lilly, Kronish and Chennabathni (2011) expand on the personal characteristics of creative teachers, and Beghetto and Kaufman (2009) expand on works from the 1950s suggesting a link between creativity and learning (p. 296). Among others, these works provided the inspiration for questioning teachers about their creativity. Survey questions identified as applying to this theme are shown in Table 4.15.

Table 4.15

*Survey Questions on the Theme of Creativity*


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4.1	I have innovative/creative ideas for teaching and learning.
4.2	It is hard to do anything differently in the VSSSP, things are always very rigid.
4.3	The VSSSP is a very flexible school provision.
4.4	The VSSSP provides the opportunity to implement innovative/creative ideas I have for teaching and learning.
4.5	I feel able to express innovative/creative ideas I have for teaching and learning in the VSSSP.

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The majority (80%) of staff members agreed they had innovative or creative ideas for teaching and learning, with only 20% of staff neither agreeing nor disagreeing with this statement. Further, a large majority (93%) of staff agreed that they felt able to express their creative or innovative ideas for teaching and learning in the VSSSP, and 100% of staff agreed that the VSSSP gave them the opportunity to implement their innovative or creative ideas for teaching and learning. As a cross-check of survey completion procedure, the question was asked again in a negative format. A large majority (87%) of staff disagreed that it was hard to do anything

differently in the VSSSP, with only 7% agreeing with this statement. A large majority (93%) of staff agreed that the VSSSP was a very flexible provision.

Evidence for creativity provided by teachers in their extended-response answers in the survey includes that they developed presentations using a variety of technology and/or media, that they had more energy and flair for lesson preparation and that they greatly expanded the range of software they used to convey knowledge. As well, teachers reported that working in the VSSSP gave them “a renewed focus” for how they “teach core concepts to students”, indicating they include “much more technology / imagery / thought provoking statements to promote independent thinking into ... lesson[s] as a consequence”.

Further, one of the staff reported:

- I was able to work collaboratively with my colleagues to extend and explore the idea that assessment tasks should be used for, of, and as, learning.

Because of the nature of the VSSSP, we were also able to step away from traditional methods of assessing students such as examinations for mathematics.

This apparent nurturing of teacher creativity and innovation as reported by the staff participants will be explored further in Chapter 5.

#### **4.3.5 21st-Century Skills Development of the Teacher**

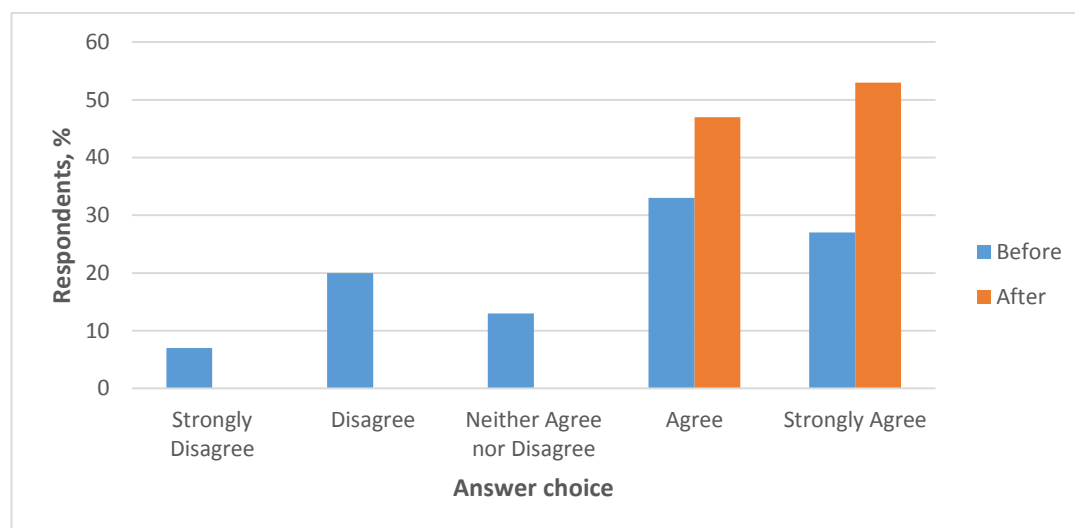
Survey questions designed to elicit information about the development of 21st-century skills by staff are shown in Table 4.16. This was an area of interest that was revealed by the literature review.

Table 4.16

*Survey Questions on the Theme of 21st-Century Skills Development in Staff*

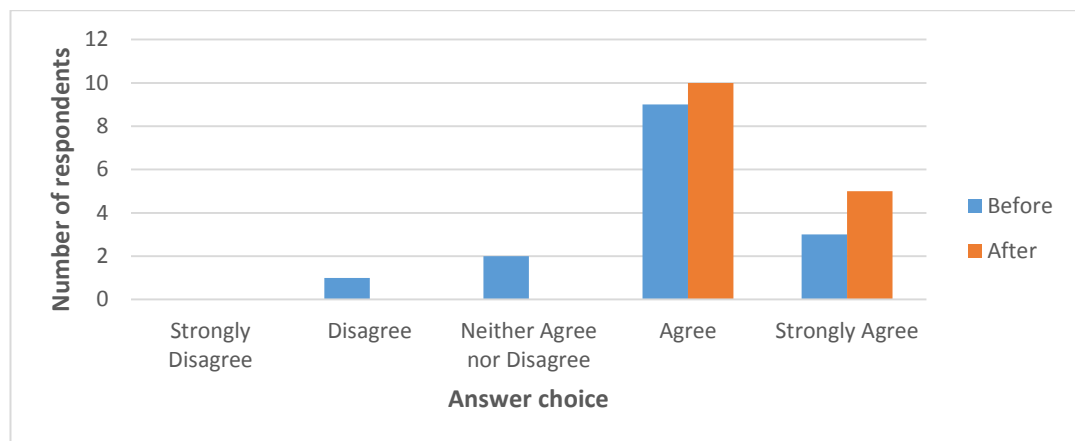
- 
- 5.1 My skill level with respect to technology in general, prior to commencing with the VSSSP was excellent.
- 5.2 My skill level with respect to technology in general now is excellent.
- 5.3 The VSSSP has helped develop my digital presentation skills significantly.
- 5.4 My ability to manage unexpected events before I joined the VSSSP was excellent.
- 5.5 My ability to manage unexpected events now is excellent.
- 5.6 Since I have been in the VSSSP my time management skills have improved.
- 

The development of staff technology skills is shown in Figure 4.25. Staff rated their ability with technology in general before and after being involved with the VSSSP. A majority of staff respondents (60%) reported that their skills with technology in general before they started working in the VSSSP were excellent. All staff respondents (100%) reported that they felt their skills with technology in general after working in the VSSSP were excellent.



*Figure 4.25* Staff-identified skill level with technology before and after being involved with the VSSSP.

A majority of staff (60%) reported their time-management skills had increased after working in the VSSSP and 73% considered their time-management skills were effective prior to commencing with the VSSSP. The staff-identified ability to manage unexpected events before and after involvement with the VSSSP is shown in Figure 4.26.



*Figure 4.26* Staff responses to the statement “I manage unexpected teaching and learning events well” before and after being involved with the VSSSP.

Finally, 87% of staff agreed that their digital presentation skills had increased considerably after being involved with the VSSSP and 100% of staff agreed that technology skills would be important in the future workplace. Digital presentation skills were essential in the VSSSP environment and could perhaps have been useful in the base school classroom of the teacher.

#### **4.3.6 The Perceived Value of the Virtual Secondary School Provision for Teachers**

This section of the results will report on the value of the VSSSP as perceived by the staff. Survey questions related to this theme included a range of extended-response and Likert-response items. The questions are shown in Table 4.17. This research theme has been further divided into a variety of sub-themes to better report on the responses from staff. Manwaring (2013) developed a comprehensive method

by which to analyse staff extended responses and that method has been followed closely in this analysis. The sub-themes identified were: (i) the perceived value regarding subject content knowledge, (ii) the perceived value regarding improved instructional practice, (iii) the perceived value regarding assessment and feedback to students, (iv) the perceived value regarding the enthusiasm and engagement of the teacher, and (v) the perceived value regarding the transfer of teaching materials and teacher skill set to the local school of the VSSSP teacher.

Table 4.17

*Survey Questions on the Theme of the Value of the Provision*

Sub-Theme i: Content Knowledge	
6.1	My syllabus knowledge after working in the VSSSP has improved.
6.2	Please outline any way(s) that teaching in the VSSSP may have extended your content knowledge of your subject area.
6.3	Please outline any way(s) in which the VSSSP may have enhanced your capacity to teach your subject.
6.4	VSSSP staff work as a team to develop the teaching and learning materials.
Sub-Theme ii: Instructional Practice	
6.5	Before I started teaching in the VSSSP, the breadth of my skill set as a classroom practitioner was limited.
6.6	After teaching in the VSSSP, the breadth of my skill set as a classroom practitioner has increased.
6.7	Please outline any way(s) that working in the VSSSP may have helped to extend your teaching experience.
6.8	Please outline any way(s) that the VSSSP may have helped you to use a wider range of teaching strategies for gifted students.
6.9	Please outline any way(s) the VSSSP may have helped you develop more effective teaching programs for gifted students.
Sub-Theme iii: Assessment and Feedback	
6.10	Please outline any way(s) that working in the VSSSP may have enhanced your ability to write assessment tasks.
6.11	Working in the VSSSP has helped me make the link between theory and practice for teaching gifted/talented students.



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Sub-Theme iv: Enthusiasm and Engagement

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- 6.12 Please outline any way(s) that teaching in the VSSSP may have enabled you to better engage your students.
- 6.13 Residential school is an essential and integral part of the VSSSP.
- 6.14 Residential school is not necessary.
- 6.15 I have grown considerably as a professional during my time with the VSSSP.
- 

Sub-Theme v: Transfer of Teaching Resources and Teacher Skill set to Local Schools

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- 6.16 I transfer teaching materials from my virtual classroom to my local school classroom.
- 6.17 I share teaching materials from the VSSSP with my local school colleagues.
- 6.18 Please outline any impact teaching in the VSSSP may have had on your ability to teach junior or senior courses at your local school.
- 6.19 Being a VSSSP teacher has helped me be a better local school teacher.
- 

#### 4.3.6(i) Perceived value regarding subject content knowledge

Staff responses to the question regarding any improvement in their syllabus knowledge after working with the VSSSP were emphatic. They are shown in Figure 4.27. A majority of staff (60%) agreed that their syllabus knowledge had improved after working with the VSSSP.

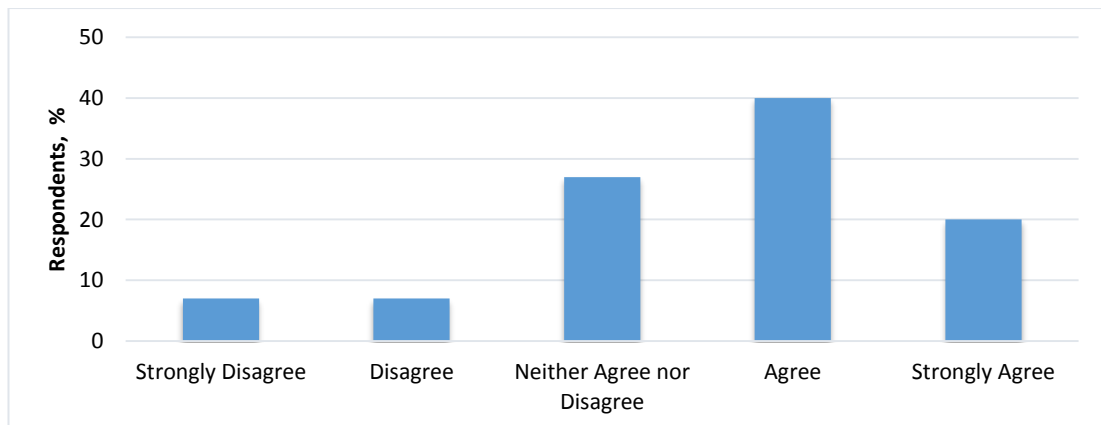


Figure 4.27 Staff responses to the statement “My syllabus knowledge has improved after working in the VSSSP”.

All staff (100%) agreed that all teaching and learning materials used in the VSSSP were developed by staff together as a team. The extended responses to other survey questions on this theme provide some supporting evidence for why the syllabus knowledge may have improved and these relate to working as a team to develop teaching materials. One teacher said:

- Due to changes in students, staff and roles in fixed intervals, I was given the opportunity to develop my own content for the course, have other teachers review it and provide feedback. I was also given the opportunity to be handed existing curriculum and resources and to further improve the teaching program. These opportunities deepened my content knowledge for my subject.

Another teacher said:

- The constant recontextualisation and differentiation of content has significantly developed my subject knowledge. Also, ready access [for students and teachers] to current developments in the subject has meant that contemporary examples of almost any area of research can be found to illustrate the significance of a particular concept.

A further comment was:

- This has enabled me to connect with teachers who are experienced in a wider number of subjects. The conversations I have within the faculty inform the decisions I make in my home school continuously. Collegial discussions make this a rich environment to share and extend subject knowledge.

A dissenting point of view was also recorded. An example of this point of view is shown in this response: “I am not sure it did. After teaching for over 25 years before starting in the VSSSP, it was very extensive anyway”. Another dissenting

point of view was: “I already had a strong level of understanding of scientific concepts across all of science and so the VSSSP has not particularly helped me here. My main benefit from the VSSSP has been my improvement in teaching technique”.

When asked to expand on any way(s) that being with the VSSSP may have enhanced the individual staff member’s capacity to teach their subject, participant responses were mostly positive. An example of a positive comment is:

- Through working with highly qualified professionals of the field, we exchanged ideas, resources and skills to develop rich programs for the subject we teach. Between the colleagues, I was also inspired and motivated to develop my teaching skills and organisation skills to improve productivity and to help students meeting the outcomes in the subject I teach.

Another positive response was:

- It focused my attention more on developing critical analysis of information with students and also posing open ended questions regarding the implication of knowledge to situations both close to home and also more globally, rather than focusing on just delivering and explaining content.

A further positive comment included:

- It has afforded me the opportunity to work with extremely talented teachers from different backgrounds. I have been able to develop my ability to contextualise the syllabus requirements in a cohesive manner. I've also been able to prepare students for Heywire [an external writing competition for students from rural, regional and remote areas conducted by the national broadcaster, ABC] which I would never have been able to do here [at the base high school].

Several teachers referred to their increased capacity and confidence with technology and how this has helped them engage a wide variety of students within their subject. This may have referred to students in both the VSSSP and their local school classrooms.

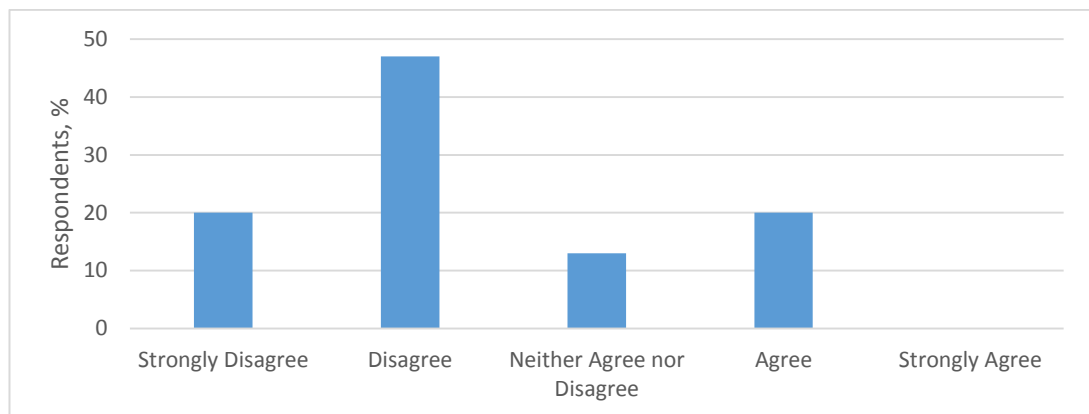
#### 4.3.6(ii) Perceived value regarding instructional practice

The survey asked questions about the classroom skill set of the individual before and after working with the VSSSP. Results for the questions about before and after working with the VSSSP are shown in Figures 4.28 and 4.29 respectively.

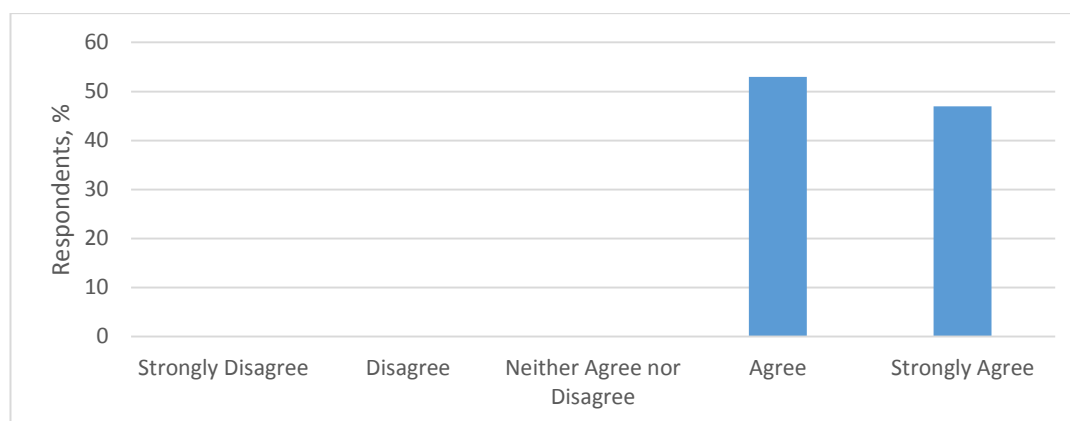
Figure 4.28 shows that only 20% of respondents agreed that their skill set as a classroom practitioner was limited—this response was given by the staff who were also relatively new to teaching; that is, who had been teaching less than five years.

The majority (65%) of staff disagreed or strongly disagreed with this statement.

Figure 4.29 shows that, after working with the VSSSP, all staff (100%) agreed or strongly agreed that their skill set as a classroom practitioner had increased.



*Figure 4.28* Staff response to the statement “Before I started teaching in the VSSSP, the breadth of my skill-set as a classroom practitioner was limited”.



*Figure 4.29* Staff response to the statement “After teaching in the VSSSP, the breadth of my skill-set as a classroom practitioner has increased”.

Other ways that staff reported improvements in their instructional practice related to teaching strategies for gifted students such as differentiation, curriculum compaction, lateral extension rather than vertical acceleration and resources that were able to engage students’ interests and had application to real-life situations. A regularly mentioned improvement was the increase in ICT tools and confidence in using them in the classroom. Strategies such as using short film clips to engage students at the start of a lesson, creating more colourful and imaginative direct-instruction presentations and more innovative ways to present subject content were also reported.

The most often mentioned improved instructional strategy was questioning techniques. Staff reported that their capacity to ask open-ended questions and higher-order-thinking questions increased significantly. Questioning for deep understanding was also mentioned regularly as an improved instructional strategy developed while working with the VSSSP. One staff member reported:

- I have attempted to show the connectedness of learning so that assessment tasks have been written across KLAs—something I have continued to pursue at my local school. I base programs very consciously around concepts (not

texts) and BIG questions. I use pre-testing more frequently to ascertain what students already know so that lessons can be pitched at a challenging (but not restrictive) level.

Another comment was:

- I had not really had to develop anything for gifted and talented students before this as I had only ever taught a few [gifted and talented students] integrated in other classes and had provided them with extension work. I now make an effort to really plan and incorporate opportunities to develop higher-order thinking skills into programs.

#### **4.3.6(iii) Perceived value regarding assessment and feedback**

A very large majority (93%) of staff agreed that they had improved their knowledge of the link between theory and practice for teaching gifted students. A very small number (7%, one respondent) disagreed that they had made any improvement in this regard. Many staff reported that this improved link related to assessment tasks for gifted students. One staff member noted:

- The collegial approach allows for a shared skill set and discussions support more refinement of tasks prior to notification being given to students. Sharing amongst faculty members has allowed the focus to be put on refining a quality product rather than continually reinventing the wheel. Cross-KLA assessments have shown the relevance of making real world connections between content.

Another staff member, in the mathematics faculty, said:

- I have used rubrics in the past for marking assessments and was able to implement that last year for the first time with a challenging new task that wasn't a pen and paper test.

While still another staff member observed:

- The VSSSP has allowed me to view the inclusion of technology in a wider range of tasks. Students' familiarity with technology has enabled them to develop a confidence that transfers into their use of technology in assessment items. Rather than reteaching technology, the daily use ensures it can be used for higher-order thinking skills.

Staff respondents also reported that there was a greater opportunity for individual feedback for students and that there was a greater opportunity for (student) self-directed extension. In addition, the fact that staff in the VSSSP worked as a team was mentioned as a benefit: "Collegially developing assessment tasks that challenge students has been a great experience". Staff also stated that they had learned how to develop a wide range of assessment tasks that would require students to utilise a range of software to complete the tasks, so adding to the repertoire of differentiation strategies for students.

A regularly mentioned issue was that of providing specific details to students about assessment tasks. Staff reported that they worked hard to develop very clear scaffolds to support students to complete the task and that a comprehensive marking guideline was also provided and well thought-out. Provision of exemplar samples for students to view before attempting a task themselves was also mentioned by staff. Outcomes-based assessment tasks, that is, tasks that specifically address outcomes as prescribed in curriculum syllabus documents, with a clear link to the A–E grading scale required by the DEC (a five-point scale with clear demonstrated proficiency standard descriptors) were frequently mentioned as an area of improved ability to write or mark assessment tasks. Extended responses included:

- The assessment tasks developed for our subject in the VSSSP have a focus on challenging students to achieve their best. The outcomes-based marking guidelines give us the capacity to objectively gauge students' level of understanding. It has given me the opportunity to work with and learn from teachers that have been recognised as being at the very top of their profession.
- It has made me better understand assessment and its purpose. The VSSSP has had a strong focus on ensuring that the task is appropriate for the outcomes being assessed. It is also been about challenging students and offering choice in the topic as well as submission style and format. This is an area that we have always struggled with at my local school.
- I was able to work collaboratively with my colleagues to extend and explore the idea that assessment tasks should be used for/of/as learning. Because of the nature of the VSSSP, we were also able to step away from traditional methods of assessing students such as examinations for mathematics.
- I was able to take an idea from the VSSSP for a cross-KLA task and expand that in my local school with other areas such as HSIE [Human Society and its Environment]. We collaboratively developed this into a whole-of-Year 10 task that was a huge success.

A dissenting point of view was recorded by one staff member, who said:

- I don't think there has been a significant impact on the assessment tasks I produce. The ones I traditionally produce are similar to the VSSSP tasks.

#### **4.3.6(iv) Perceived value regarding enthusiasm and engagement**

Staff often indicated that they enjoyed the contact with other motivated and enthusiastic teachers. The face-to-face contact possible at a residential school was



reported nearly unanimously as being of benefit to reinvigorate the staff member. Figure 4.30 shows staff responses to questions about whether or not a residential school was considered necessary. This was in response to two questions asked at separate times throughout the survey as a means of ensuring respondents were not simply choosing the same response throughout.

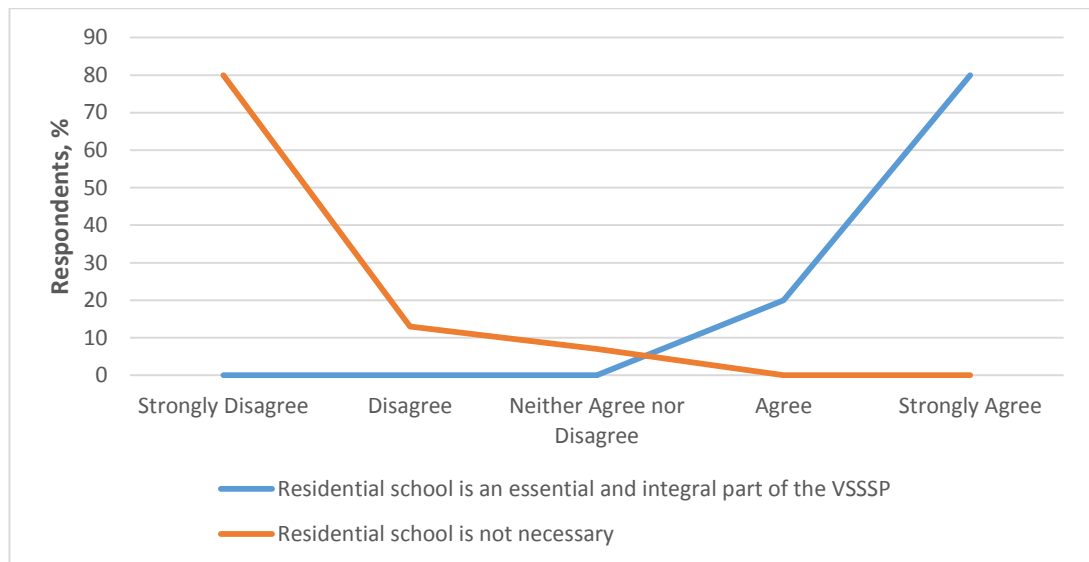


Figure 4.30 Staff responses to statements about the necessity of residential school.

Other motivating factors reported by staff included the joy of working with engaged and motivated students who were enthusiastic about learning. Greater student achievement was also seen as a motivator for staff. Another reported a “greater excitement and love for my subject area because of a creative, receptive audience”. The opportunity to work collegially with other staff was also often cited as a motivating factor. Further, one teacher said:

- It has given me a renewed focus on how I teach the core concepts to students.

I have included much more technology / imagery / and thought provoking statements to promote independent thinking into my lessons as a consequence.

While another mentioned a professional opportunity that was now available had increased their motivation as a teacher:

- Coming to a small rural school straight from university then marrying a local farmer with connections to the land meant I could not apply for a transfer to a larger school in another area. The VSSSP has given me a professional opportunity that I might otherwise never have been able to achieve.

On that same theme, a different staff member commented:

- The VSSSP fulfils my need of teaching/learning to students who wish to do well and are constantly questioning and presenting new ideas. Being from a smaller school, I would have either moved from Western NSW or have left teaching altogether.

A further comment from one staff member was:

- I was also inspired and motivated to develop my teaching skills and organisation skills to improve productivity and to help students meet the outcomes in the subject I teach.

#### **4.3.6(v) Perceived value regarding transfer of teaching resources and teacher skill set to the local school**

Teachers in the VSSSP worked in two schools, the virtual secondary school and their local public secondary school. It was common for teachers to transfer teaching materials developed in the VSSSP into their local school, either to their own mainstream classes or to their colleagues in the staffroom. A very large majority (93%) of staff reported that they transferred teaching and learning materials developed by the team in the VSSSP into their mainstream classes at their local school. As well, the same vast majority (93%) agreed that they shared their VSSSP-developed teaching and learning resources with their colleagues at their local school.

Staff made comments such as “I believe teaching the VSSSP has enhanced my teaching of even the senior years at my home school. I seem to be able to pull concepts and ideas much easier than prior to teaching in the VSSSP” and “Through working with highly qualified professionals of the field, we exchanged ideas, resources and skills to develop rich programs for the subject we teach”. The zero footprint model was mentioned by staff as a positive: “Physically, because the VSSSP fits around my local school’s timetable, it has not impacted my ability to teach specific courses or classes”.

Some staff reported negative impacts, such as time away from the local school senior classes while they were attending a residential school for three days each term, especially if the staff absence due to residential school coincided with local school examination time for senior students. Another staff member reported that the time they spent marking and preparing for their VSSSP class was resented by their local school principal who considered it took time away from the local students.

The learning management system (Moodle) used by the VSSSP to host all teaching and learning resources was mentioned as a positive tool for transfer of resources. One staff member stated:

- I think I am more able to meet the needs of students who are gifted and talented by being exposed to more gifted and talented students and their learning idiosyncrasies and also having more resources to use for extension work. I think that also having Moodle as a central learning technique has improved my use of this at my local school.

The final question of the survey, “Is there anything you would like to add?” elicited a range of responses applicable to this theme. One staff respondent said:

- The VSSSP allows teachers and students the opportunity to collaborate with their peers in a way that was previously not possible for many in regional and remote NSW. It addresses a gross inequality between regional and metropolitan areas. The VSSSP has already begun to dampen the self-perpetuating trend of GAT [gifted and talented] students leaving the public education system in regional NSW, or leaving more remote areas for larger centres, by allowing students access to a suitable curriculum in nearby public schools. The benefit to students and their small communities must be enormous.

Another respondent commented:

- The VSSSP has encouraged me to be very flexible—there is no one way that it fits all. I think quickly on my feet and can usually achieve a happy compromise. It gives opportunities to highly committed students (in terms of sport, leadership, academia) to still acquire extension in their core subjects. The VSSSP promotes a wide community of students, teachers, xSP [the liaison person at the local school], and parents all working with a common goal of engaging and educating our brightest. I have received a lot of interest in the VSSSP from other schools, teachers and even pre-term teachers who have observed my synchronous lessons or heard [about] the enjoyment lessons give.

#### **4.3.7 Results from Partner School Principals**

Several partner school Principals were interviewed to gauge their perception of the VSSSP and to add depth to the data collected about the operation of the VSSSP. The leadership perspective is sometimes slightly different from the teacher

perspective and it is included here for completeness. The semi-structured interview questions are provided in Appendix E.

#### **4.3.7(i) Initial thoughts about the VSSSP**

Principals were asked to share their initial thoughts about the VSSSP. Several of the principals had been at a meeting held prior to the VSSSP opening where the idea was mooted. The results show that a collaborative approach was the design from the outset, with Principals asked to be part of something greater than their own school. The following extracts from interview transcripts show the variety in school enrolments across the region and the manner in which the VSSSP had been received by these Principals in the first instance:

- We'd had virtual faculties before, so we already knew about getting started to work together using technology and at a distance, with the occasional face to face, to support young teachers out there. And the VSSSP was the next step with students. We'd had i.xtend, which was the regional gifted and talented program in primary schools, which worked not quite in a virtual environment, but using technology to connect the kids and using things like e-mail to exchange work and that sort of thing. But the kids stayed in their own school, they didn't go somewhere to have their lessons, they had their work provided. And teachers came out of their school to run that, or were given secondments, or period allowances or whatever to run that. The Regional Director said "I don't want it [the VSSSP] in one of the big towns, because all that will mean is only the kids from that town will get to go there". The School Education Director who was pretty much into technology and looked after that sort of area for our region, and some other really creative people, and knowing the

huge distances, they came up with the virtual selective school, and put that to the Principals, “What do you think of this?”

Now, she didn’t have to put it to anyone. It was her decision entirely. But the model required everyone on board, because there was going to be lots of give and take between every school potentially in the region being involved, and cooperating with it and making some sacrifices and getting some benefits back, both ways it could go. [Principal of School A, > 600 students]

- It’s been very positive. We were very fortunate that we’ve had some students that have gone through who really achieved very great results with it. It is something, it’s like all education though, it’s individualised but then the outcomes are individualised too, so some students have found it a great way to learn and other students prefer the mainstream approach. We work with the VSSSP to tailor it to suit the individuals. [Principal of School N,  $\approx$  400 students]
- I was completely aware of the VSSSP through E2, [another virtual collaboration that existed in western region for senior secondary school students in four schools] and so I always felt that that was a very good idea, and a logical extension of what we were doing in E2, which was video conferencing and doing shared lessons across four sites. So it didn’t come as any surprise that the virtual selective school got up. I suppose the technology behind it was very surprising as regards the laptop use and the methods of transferring the information from teacher to student. So that was a lovely surprise getting people together and everything was just so positive and so new. I think I’ve indicated also that for me, who is okay with technology but no more, the whole thing really did surprise me as how this could work. And

it surprised many people in the community as well, about how it could work and how the whole thing could be. So I'm deeply impressed with it and how it's gone. [Principal of School D, <200 students]

- The idea of the meeting, from memory, was to get an overarching support from everyone, whether you were going to have children at it [the VSSSP] or not, no one knew that. But obviously we knew we had capable children in the area and that was kind of, I think, the way Western worked on a lot of things was get us together and whilst we didn't know the fine detail, you know, the philosophy of it all was strongly supported by everyone. And we had experimented I suppose with virtual education in a number of areas, maybe on a smaller scale, so I guess it was the opportunity, and I think we had a few forward-thinking people who were able to see how it could work and make it work. [Principal of School C, ≈400 students]
- Our school is in a remote town and at the beginning there was a fair amount of learning I think for everybody, students, staff, parents, staff at the VSSSP but we've gotten through that and we've been able to really use that as a highlight in our school. It allowed our students access to something that they possibly wouldn't have had access to in terms of the higher-level thinking. I was concerned a little bit about if it would set those students apart from their peer group but that didn't appear to end up an issue. They have a map up with all the students around the region and where they've gone and often I've been in the room where they work in and they've been talking about somebody else from another school and I think well that's okay they've made that connection. [Principal of School P, ≈200 students]

#### **4.3.7(ii) Benefits and challenges for the local school**

Principals were asked to share any benefits or challenges being involved with the VSSSP had for their school. Extracts from interview transcripts are as follows:

- Probably the benefits of being in it are that we can offer the town the same kind of level of education if you like, or the same opportunity of education that you would expect in a larger town so it's a benefit. Some of the more tricky things that I think are, really keeping an eye on the students' well-being.

Many of our kids in school not just in the VSSSP, are very shy and they don't have a lot of experience outside of this town and their own family so going to something outside pushes them a bit. Being able to go two hours away is not so bad and being in an environment with lots of other kids is helpful. We've been able to get our kids to university but they don't all stay there – some have never been away from home before and it is a huge challenge for them. The VSSSP is building their confidence to manage being away from home and their home town at a much earlier age. [Principal of School P, ≈200 students]

- One of the surprises was the teaching allocation that teachers were given. The resourcing was such that the teachers were given 0.4 allocation for what was in effect a 0.2 teaching load, and it's one of the first times I've ever seen the Department come at giving a realistic resource base for something that's innovative and hugely demanding to establish and get going. And I think that 0.4 made it possible for the teachers to actually do it. If you had to teach the full load and then you had to get your head around this new platform and new ways of developing courses and new ways of interacting with kids, and in



reality doing most of the work out of your classroom teaching time, as opposed to your normal teaching where you do have study periods that you can prepare lessons and things, I think if we hadn't had that, there would be less of the very high calibre teachers apply to be part of the VSSSP staff.

Most people see the real value of kids in Western Region, no matter which school they go to, having opportunities to be challenged and developed at the level that they might be if they were in a big town or a big city, and to work with like-minded kids. They also see the opportunity for teachers, I mean, that is only limited to the subjects that it currently targets, and I think there are other teachers who would be willing to put their hands up for it if they were able to. There's music teachers for example who have the capacity to work with quite gifted kids, but this platform at the moment doesn't suit their subject area. But I can't see why it couldn't develop that way. [Principal of School A, > 600 students]

- ....it just depends upon the cohort, sometimes we have had some cohorts that have been less than completely engaged in the program and that has been a challenge because there are very high expectations on these students, both from my school, the VSSSP and their parents. When students, either because of their personality or because of their motivation or whatever else, don't engage as well as they should, the challenge confronts the school to support the virtual program, to maintain the faith of the parents in the program and to give the student the best structure in which to learn. It can be disappointing. In terms of the positives I think it's keeping the child in our school. From a school's point of view that's a number one, like having those talented kids able to contribute across other subjects and across the school socially is a

really good thing. The individual kids get such a big benefit from being extended, I think that a challenging academic workload is a really good thing for individuals. I mentioned earlier that I would love to have had some teachers teaching because then that would be beneficial for the school as well. It's been a very positive experience even for kids that haven't followed it all the way through, I can see some benefit for them. It gives them the time to examine their own approach to learning; which is a really good thing. Many students aren't ever really challenged to do that. They may go to class and get shown how to do it or they get led all the way, whereas in the VSSP from my experience, the kids have to work that out for themselves. [Principal of School N,  $\approx$  400 students]

- My concern was that perhaps the kids might be a bit left or lost when they're doing a third or a half of their lessons without their cohort. But I haven't seen any of those kids struggle at all. They all like it. They're all happy. So I think that the process of these kids, and particular sorts of kids, really do like those challenges of their learning and then fit back quite happily in class. We had a little bit of an issue trying to work out what on earth we were going to do with regards to the awards in school. We then over-awarded I think, the VSSSP students. I don't know if you can over award any student, but they seem to get a lot more awards for what they're doing than the classroom teacher of here with equivalent-minded kids at the top end. But we've worked that out. That took a little while to work that out, so it was a little bit more on parity. Even though they do get more awards than most kids it's not as excessive as it was. So award system, I think each school would have a different take on that award system. We've introduced it obviously to

presentation evenings, and that again needs to be on the radar for everybody not to miss it out. That kind of thing. So there's no real challenges, it's just another load that you consider for the benefit of kids and for good children outcomes. [Principal of School D, <200 students]

- I guess sometimes it's been a little bit up and down, but it's probably dependent on the nature of the students, and because the first, I feel that the first one [student], because it was obviously new, to some degree we were finding our way, but on the other hand because it was new, I think there was a lot more support and visibility of people on the ground because obviously there was a vested interest in making it work. One of our teachers was involved and she loved it. It came late in her career and it was something she was looking for, so it was a real boost for her in one sense to think that she could do that, and I know whilst sometimes technology or different things frustrated her she loved the challenge and loved that whole concept. No one has put their hand up since, or really enquired. And to be honest, I don't know if I've asked anyone within Maths and Science. If I give someone to the VSSSP I haven't got anyone who can replace them, and I imagine that's probably a big issue; trying to find a capable Maths casual is like trying to find a needle in a haystack, and so even if I had someone interested I'd be fairly reluctant to release them. [Principal of School C, ≈400 students]

#### **4.4 Results from External Standardised Tests**

In this section the results achieved by students in the VSSSP in external standardised tests completed by all secondary school students in NSW will be reported. The results will not be analysed with any test of significance as the sample size is too small compared to the comparison group. At best, the sample size in any

one Year group is 29 students. The smallest comparison group is made up of over 450 students and a larger comparison group comprises thousands of students. The data will be reported and analysed with reference to comparison groups however no statistical test of significance can be performed to test the confidence interval of these comparisons.

#### **4.4.1 National Assessment Program in Numeracy and Literacy**

Students sit external standardised tests in literacy and numeracy in Years 3, 5, 7 and 9. The literacy and numeracy tests are conducted by the National Assessment Program and are tests which are conducted across Australia on the same dates each year (ACARA, 2015). The tests are referred to as NAPLAN (National Assessment Program – Literacy and Numeracy) and are conducted over several consecutive days. The tests aim to measure the academic growth of students over an extended period of time in the areas of reading, writing, language conventions (spelling, grammar and punctuation) as well as numeracy. The writing phase of the test changes focus from time to time, for example the response required for several years was in narrative format, then a change to persuasive writing format was used. This change in response type determines that the writing component for one cohort of students cannot be compared accurately to their writing result from two years prior. In this instance, schools tend to use all other phases of the NAPLAN tests to examine student academic growth. Student attainment is measured against their previous result and the results of their same-age peers to establish individual academic growth. A published statistically expected growth based on the previous attainment or starting score of the student, is compared to the student's actual academic growth as determined by the external standardised tests. It is imperative that a student is

matched to their own starting score from two years prior. If a student does not sit the NAPLAN test due to absence from school, their data cannot be matched to their previous result two years earlier and as such is removed from a comparative data set. At times, students will be present at school for some phases of the NAPLAN tests and not others. In this instance, the number of matched students recorded as having a particular starting point may differ between phases of the tests. The results reported in this research are for matched student results only and are shown following.

The Year 7 NAPLAN results have been omitted from this research as they measure growth from Year 5 to Year 7. The tests are administered in mid-May each year and with the school year starting in February in Australian schools, the Year 7 data are collected after just 11 weeks at the VSSSP and 70 weeks in the primary school setting. This could potentially make the results unreliable as an indicator of student progress in the unique VSSSP learning environment as so much of the elapsed time is in the primary school setting.

Tables 4.18, 4.19 and 4.20 show the average results of students in the reading and numeracy phases of NAPLAN 2012, 2013 and 2014 respectively. Students in the VSSSP cohort have been compared to all students in the WNSW Region cohort with the same starting score in Year 7 as students in the VSSSP. The WNSWR cohort results include the VSSSP students as they are part of this wider cohort. As well, the tables show the statistically expected growth of all students attending government schools in NSW with the same starting score in Year 7 as those students in the VSSSP. The comparison between expected growth, the growth of students in a similar schooling situation and those in the VSSSP will be explored in Chapter 5.

Table 4.18

*NAPLAN Section Results 2012*

Reading Year 9 2012				Numeracy Year 9 2012			
Year 7 Starting Score	Average Growth WNSWR N=380	Expected Growth NSW N=47,463	Average Growth VSSSP N=27	Year 7 Starting Score	Average Growth WNSWR N=482	Expected Growth NSW N=47,463	Average Growth VSSSP N=27
523	30	28	61	546	24	30	56
567	25	23	66	574	34	30	-12
601	18	15	47	579	29	32	59
622	17	14	22	585	38	30	94
633	10	11	27	603	18	30	43
646	10	10	3	623	26	29	77
660	10	10	32	637	41	28	95
677	-6	10	45	644	21	31	36
697	-10	10	6	652	15	29	15
723	-36	10	-17	661	25	31	47
				669	15	30	28
				679	5	31	21
				710	52	28	47
				723	27	23	9
				737	3	23	37
				754	34	19	52
				773	-23	11	1
				798	-38	10	-37

Table 4.19

*NAPLAN Section Results 2013*

Reading Year 9 2013				Numeracy Year 9 2013			
Year 7 Starting Score	Average Growth WNSWR N=358	Expected Growth NSW N= 47, 106	Average Growth VSSSP N=29	Year 7 Starting Score	Average Growth WNSWR N=366	Expected Growth NSW N=47,106	Average Growth VSSSP N=29
493	41	44	80	537	42	31	37
569	20	31	30	542	26	31	39
584	25	28	30	548	25	32	75
593	28	25	67	559	22	30	44
610	20	24	42	582	35	34	38
620	29	21	43	587	32	33	39
631	22	20	55	599	28	34	21
643	20	20	55	612	33	32	57
657	12	20	38	625	32	37	-27
672	3	20	33	632	29	37	44
692	5	20	45	639	38	38	42
752	-29	20	-23	662	45	42	50
				670	31	41	58
				679	45	45	29
				689	29	46	57
				710	41	49	88
				689	29	46	57
				710	41	49	88
				722	44	55	83
				771	70	46	70

Table 4.20

*NAPLAN Section Results 2014*

Reading Year 9 2014				Numeracy Year 9 2014			
Year 7 starting score	Average Growth WNSWR N= 488	Expected Growth NSW N= 46, 290	Average Growth VSSSP N=23	Year 7 starting score	Average Growth WNSWR N= 488	Expected Growth NSW N= 46, 290	Average Growth VSSSP N=22
584	20	25	78	579	30	29	30
602	16	22	94	604	28	24	58
611	14	18	42	617	27	22	14
620	12	18	63	624	26	23	77
631	10	15	29	631	26	23	0
642	10	10	42	638	26	23	37
654	10	10	71	679	22	19	71
667	10	10	22	688	21	19	25
682	10	1	31	699	19	17	53
699	10	1	-5	710	18	17	-4
720	10	1	22	721	16	14	89
746	10	1	-22	749	10	13	17
				823	10	1	32

The comparative progress of students in WNSWR and the VSSSP with the same starting score in Year 7 who met or exceeded statistically expected growth, as well as those who did not meet the statistically expected growth or whose growth was negative for NAPLAN 2012, 2013 and 2014 is shown in Figures 4.31, 4.32 and 4.33 respectively. The WNSWR cohort at any particular starting score does not include students in the VSSSP. They have remained separate as the study group.



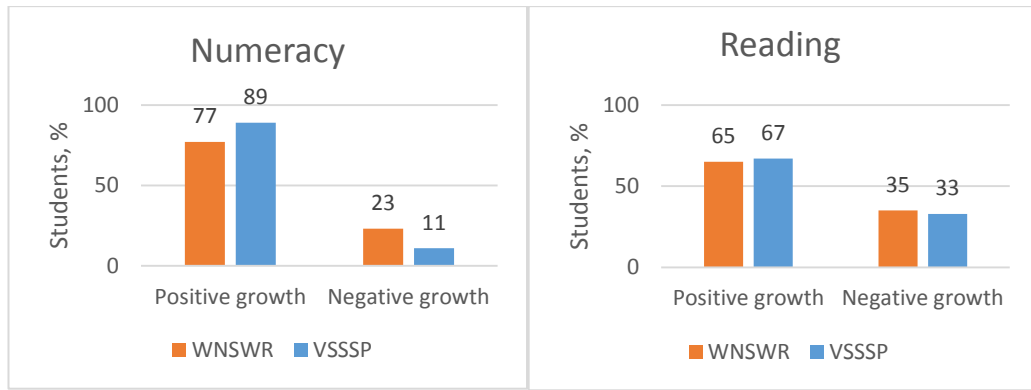


Figure 4.31 Percent of students with positive or negative growth in NAPLAN 2012.

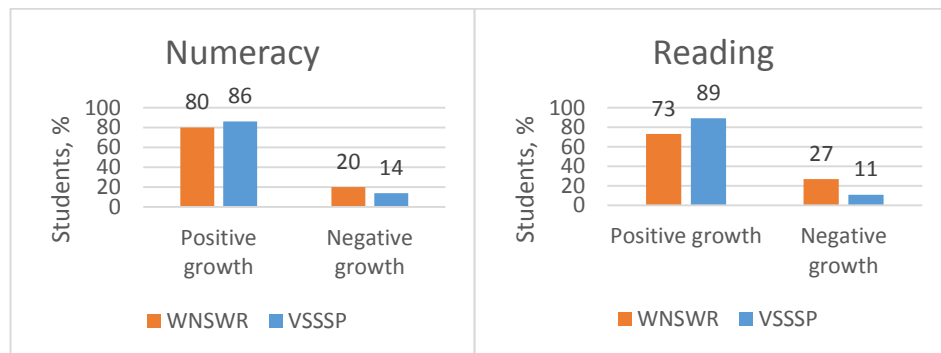


Figure 4.32 Percent of students with positive or negative growth in NAPLAN 2013.

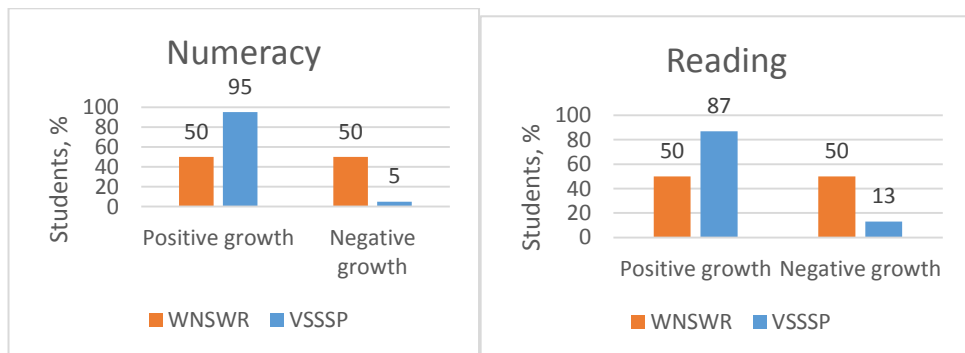


Figure 4.33 Percent of students with positive or negative growth in NAPLAN 2014.

The results for positive and negative growth show that the VSSSP had a greater percentage of positive growth and a lesser percentage of negative growth through all years in both Reading and Numeracy when compared to western region as a whole. This result will be discussed in more depth in the following chapter.

### 4.4.2 Essential Secondary Science Assessment

The second set of standardised test results for this research are VSSSP student results in the Essential Secondary Science Assessment also known as ESSA (NSW DoE, 2016). Results for three consecutive years are shown in Figures 4.34, 4.35 and 4.36 respectively. This standardised test aims to measure how students make meaning of scientific knowledge, understanding, skills, values and attitudes and is offered to all Year 8 students in government schools in NSW. Table 4.21 shows a description of the different components of the ESSA test and is an explanation of the horizontal axis in Figures 4.34, 4.35 and 4.36.

Table 4.21

*Explanation of Horizontal Axis in Figure 4.34, Figure 4.35 and Figure 4.36*

Horizontal Axis Label	Description
Overall	Average of all individual components of the ESSA test
Extended Response	A measure of deep understanding and use of appropriate scientific metalanguage to explain scientific processes which students have completed in Years 7 and 8 science
Knowing and Understanding	A measure of knowledge and understanding of scientific concepts including the nature and practice of science and the impact of science on society, technology and the environment
Communicating Scientifically	A measure of skills required to understand and respond to a range of scientific information in a variety of media
Working Scientifically	A measure of skills required to plan and conduct investigations in addition to thinking critically to solve problems

Figure 4.34 shows the ESSA results for the inaugural Year 7 cohort at the VSSSP in 2010 as at the end of Year 8 in 2011. Results are given for all students in NSW government schools, for students at government schools in Western NSW Region, for VSSSP students, and for students in other selective schools. The other

selective schools data are an average of results from 17 fully selective high schools, and thus allow a comparison of VSSSP to a similar ability cohort.

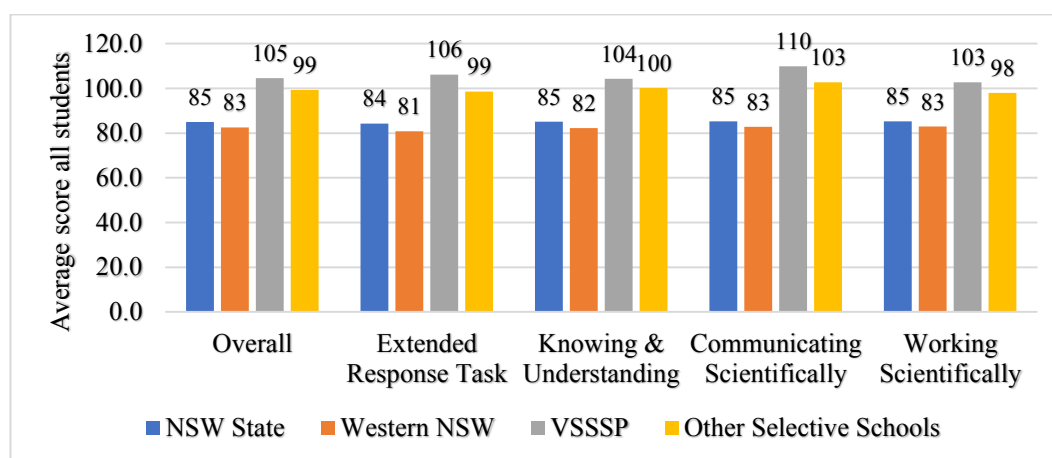


Figure 4.34 Essential Secondary School Assessment (ESSA) results 2011.

Figure 4.35 presents the ESSA results for the second cohort of VSSSP Year 7 students who began Year 7 in 2011. These students completed their ESSA test in 2012.

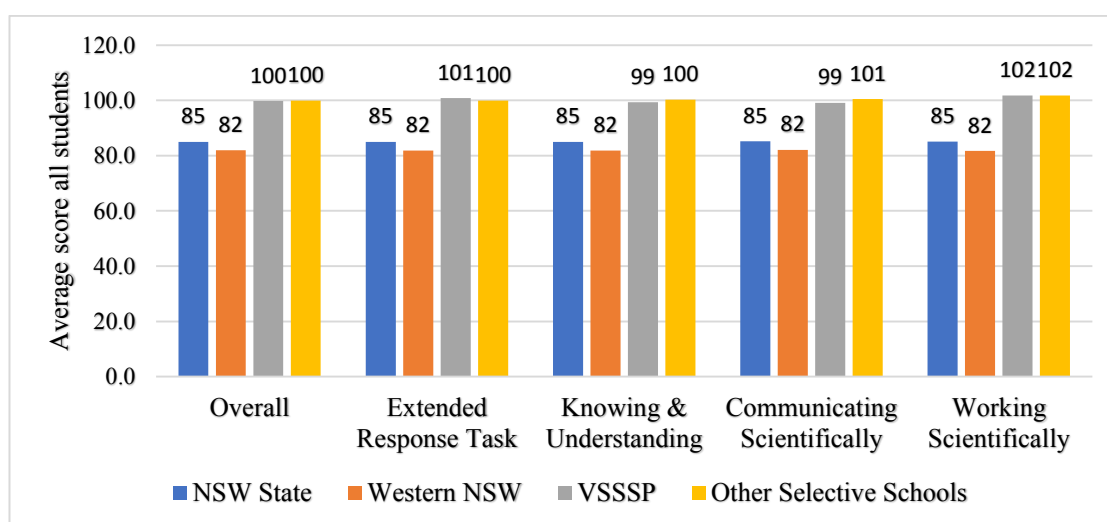


Figure 4.35 Essential Secondary School Assessment (ESSA) results 2012.

Figure 4.36 displays the results for the third cohort of students in the VSSSP. These students began in Year 7 in 2012 and completed their ESSA test at the end of Year 8 in 2013.

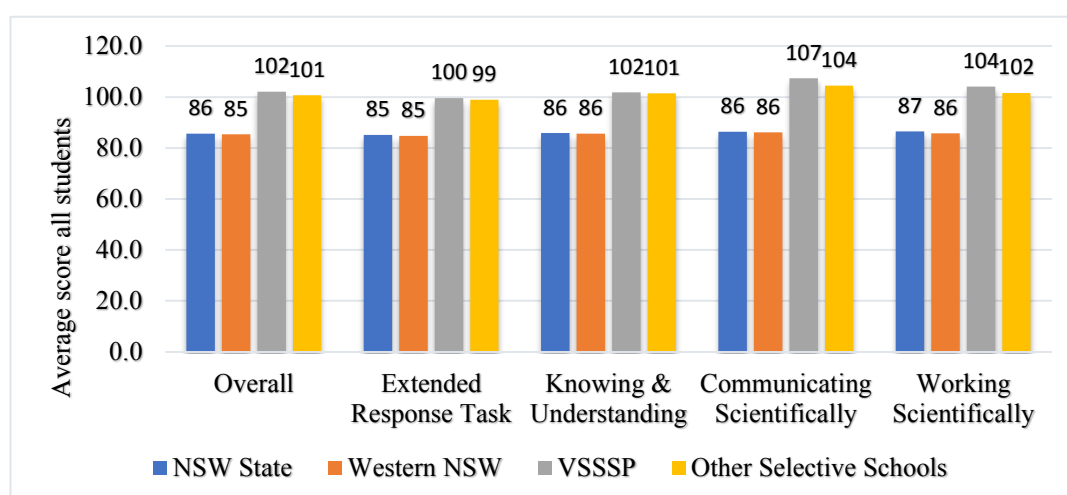


Figure 4.36 Essential Secondary School Assessment (ESSA) results 2013.

This concludes the results section for external standardised tests. The results showed the achievements of the VSSSP students for three consecutive years in the Year 8 ESSA test for science understanding. This section also showed the results in NAPLAN phases for reading and numeracy for three consecutive years of Year 9 students in the VSSSP.

## Summary of Chapter 4

Chapter 4 has been an exposition of the results of surveys given to students, staff and parents, with survey answers supported by extracts from interviews to add depth where appropriate. The final section of Chapter 4 was a display of the achievements of students in the VSSSP in standardised achievement tests for reading, numeracy and science. Chapter 5 will be a discussion of the combined results in relation to the themes of the research. These themes are sense of belonging, creativity, 21st-century skill development, transfer of skills, the nature of the individual and quality teaching, and subsequent collation of these themes to respond to the final theme of the value of the provision. This final theme will then be used to address the research question and sub-questions.

## Chapter 5: Discussion

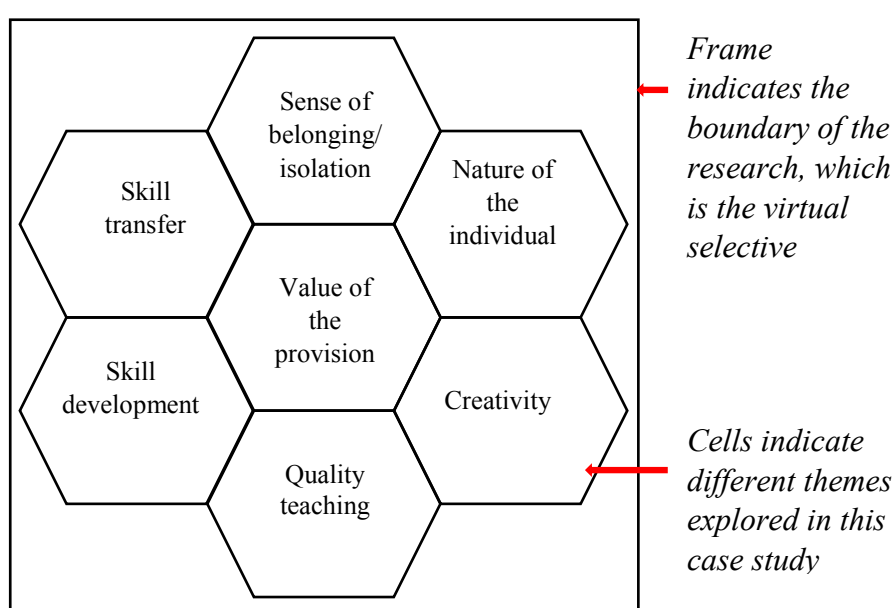
To recap, Chapter 1 described the context of this research and the unique nature of the case study Virtual Selective Secondary School Provision (VSSSP), including its location in a rural and regional setting of NSW. Chapter 1 also identified the place of the researcher in this context. Chapter 2 showed a review of relevant literature and allowed the identification of some themes applicable to the research. Chapter 3 discussed methodology in general and described the specific method used in this research. Chapter 4 gave a comprehensive account of the results from surveys and interviews with students, parents and staff participants in this research as well as the results from standardised tests of achievement that were completed by student participants in the case study, as part of their normal attendance at school.

In this chapter, Chapter 5, results from surveys, interviews and standardised tests will be drawn together to make meaning, then these meanings will be compared to literature as described in Chapter 2 in an attempt to answer the research question “In what ways, if any, did the VSSSP meet the educational and affective needs of gifted secondary school students in rural, regional and remote areas”? To assist in answering this overarching research question, three sub-questions have also been posed:

1. In what ways, if any, did the VSSSP support the learning and teaching of gifted and talented students located in rural, regional and remote secondary schools in NSW?
2. In what ways, if any, did being involved with the VSSSP support the students and staff with their mainstream classes?

3. In what other ways, if any, did being involved with the VSSSP develop the student or staff member?

Sections 5.1 through to 5.6 will discuss the results of this research and relate the results back to existing published research that has been included in the literature review. Icons to remind the reader of which participant group is included in each section will be used. These icons are a single cell from the research model with a colour to indicate if it is from students (blue), teachers (green) or parents (orange). The general, uncoloured research model from Figure 3.2 is provided again here to orientate the reader for the structure of this discussion. The themes identified in Chapter 2, around the outside of the model, describe different aspects of the central cell, the value of the provision, and so provide answers to the main research question.



Diagrammatic representation of the research model shown in Figure 3.2.

## 5.1 Sense of Belonging or Isolation



The significance of a positive sense of belonging and the potential negative impacts of isolation are clearly evident in the literature studied and the results in all

participant groups of this research (students, parents, staff and partner school principals) support extant literature on the positive effects of similar-ability grouping. Students spoke of finding friends quickly and described them as lifelong friends, communicating with them regularly outside lesson times even though they lived in other small regional towns at a considerable distance. Students also spoke of feeling more confident in themselves, making friends of equal or higher intellectual ability and how much fun it was to be part of residential schools when they occurred. Students also reported they felt more connection with their teachers at the VSSSP than their local school and how much they looked forward to going to school now that they spent part of each day online with a similar-ability cohort. These comments indicate that students felt their affective needs, in particular, were met by the VSSSP.

Parent respondents corroborated or extended the student perception with emotive phrases such as “my child loves it” and “being part of the VSSSP is just like being part of an extended family”. Parents also commented on the positive experience of residential school and how much their child enjoyed it. In interview, one parent shared their child’s beaming face and exclamation when they disembarked from the transport after residential, shouting “Mum, mum I’ve got friends!! They can read and we’ve read all the same books and everything!” The parent reported that the local Year group cohort for this student was fewer than 10 students, all with learning difficulties. Parents in general agreed that their child’s affective needs were being met through the opportunity to make like-minded friends.

Partner school principals reportedly worked hard to ensure that the students who belonged to both the local school and the VSSSP felt a sense of belonging in both places. Strategies included ensuring the awards given by the VSSSP were recognised at the end-of-year presentation assembly at the local school. Principals

reported that this small gesture seemed to engender a sense of pride within the student and encouraged conversation about the virtual program with others.

Teachers in rural and remote locations often work with a very small number of other staff (Halsey, 2005; Manwaring, 2013), and this sense of belonging or isolation can have an impact on staff. Staff reportedly felt a sense of belonging with other staff in the VSSSP, which manifested as enjoying a wider variety of professional conversations and an opportunity to be mentored by more experienced staff. These opportunities were sometimes not possible at their very small local schools, showing that the VSSSP gave staff members opportunities for development. As application for a teaching position at the VSSSP was voluntary and selection was merit-based, staff reported in interview that they felt “a kindred spirit with other staff who were up for the challenge of something new”. Overwhelmingly, staff results showed that bullying was not present in the VSSSP.

In interview with senior officers of the VSSSP, it was revealed that opportunities for non-academic communication between students were facilitated in the Learning Management System (LMS) in a deliberate attempt to build a sense of belonging. A virtual playground was in place where students could add comments to a forum to chat with their friends and make new ones. Students new to the VSSSP gained access to this forum two months prior to the beginning of lessons and were able to build rapport with one another and others already at the VSSSP. As with all schools, the conversations needed to be within respectful boundaries. Senior staff reported in interviews that throughout the five years of operation of the VSSSP only one comment was deleted by the Administrator for being borderline disrespectful. The total collection of comments numbered in the tens of thousands with often 2500 comments between students in the two months of holidays prior to joining lessons.



This level of interaction further reinforces the finding that students felt their affective needs were met through participation in the VSSSP.

There was a very small number of mentions about isolation or a negative experience in the VSSSP. One student reported in the survey that they felt bullied but did not elaborate further. A negative experience was reported by both one parent and one student when the student was the only student at their local school who was involved with the VSSSP. The student reported that they felt isolated and the parents reported that their child had been miserable as the only student at their local school involved with the VSSSP. Another negative comment by a student was that being in the VSSSP made it difficult when they went back to their local school classes as their friends were sometimes a bit distant when they returned. In interview, one student stated that their local friends did not understand why they went to a different location for English, mathematics and science and seemed a bit resentful. The student added that this resentment then made it a bit harder for them to fit back in with the crowd at the local school. When asked if they thought they should give up the VSSSP in order to connect more with their local friends the answer was an emphatic “no way!”. For these students, the “forced-choice dilemma” (Gross, 1989) was not an issue. Thus while there were isolated instances of negative effects on affect, these instances manifested outside the VSSSP, not within it, and were strongly counterbalanced by the positive effects within the VSSSP.

Senior Executive staff of the VSSSP in interview commented that in the early days there were a small number of students, between 10–20% or three to six students, who withdrew from the VSSSP after one school term (about 10 weeks). In the early stages there was no exit interview process in place but it was added over time. In exit interviews conducted by the senior executive of the VSSSP, some

parents commented that their child had never been at school with similar-ability students and they found it too challenging, exemplifying the “big fish little pond” effect noted by Seaton et al. (2010). Other parents commented that their child had been lonely as the only participant in the VSSSP at their school and other parents noted that their child did not have the skills of independence, such as time-management and organisation, which were essential in the VSSSP.

Literature reviewed previously that aligns with the findings in this study is re-presented here. Plunkett and Kronborg (2007) attest to the positive experiences reported by students and their parents when students were grouped together for academic instruction. Likewise, Gross (1989) reported the perceived mutually exclusive choice by students to either achieve academically or have friends, as a measurable phenomenon amongst gifted students in a mixed-ability setting. In this study, the need to make such a choice was removed, for most students, by the opportunity to achieve academically with like-minded peers within the VSSSP but at the same time maintain friendships in their local school. Those students who did leave the VSSSP seem to have chosen friendships over academic challenge and/or achievement. Gagné (2008) described the influence of a student’s milieu upon transformation of giftedness into talent and finally Neihart (2007) suggested that for cultural minorities who are also gifted, grouping gave them not only a sense of belonging intellectually but in a peer cohort as well when moving throughout the wider school environment.

A contrasting point of view in the research was that grouping together students of similar intellectual ability may harm academic self-concept when the student found themselves not to be the “star” pupils any more when moved from a mixed ability setting to a more homogeneous high-ability setting (Marsh & Craven,

1997). Some students in this study did demonstrate this point of view, as reported above.

This section has described the alignment between student, parents, staff and partner school principal results with regard to belonging or isolation.

Overwhelmingly, a positive sense of belonging was reported. This sense of belonging was on both an academic and social level for students and a professional and social level for staff. Some of the sense of belonging was facilitated by processes devised by senior executive staff at the VSSSP; however, much of the positive sense was intrinsic to mixing with like-minded people.

A sense of belonging is important to support the affective needs of all students but especially gifted students who may find it hard to locate others with similar interests in areas of small population (Chessman, 2007). Affective needs such as a highly developed sense of justice, a unique sense of humour and well developed sense of empathy are other affective needs that may be met when a sense of belonging is built (Gross et al., 2004). An example of the sense of justice can be seen in the extended response written by one student who was to finish at the VSSSP at the end of their final junior year, but who wished to continue into their senior years. That student was very angry at the state government for not arranging for the VSSSP to extend at that point in time into the final two years of schooling. The comment in full follows and the sense of justice, or injustice felt by the student is clear in this quote:

I am angry at the Department of Education and Training for not doing more to continue this wonderful program. I am disappointed because all decisions in regards to the future of the VSSSP were made without collaborating with the students. Out of all the times in my life when I have been treated as an

immature, dumb kid, this has been the most significant. The VSSSP students, who were in the program because they were bright, were seen merely as interchangeable by the government. This is yet another example of bureaucracies acting without consulting with the people who the actions will affect the most. [Year 10 Student survey extended response]

An interview response from a Year 8 student described how much they enjoyed the online classroom as they could “just type the answer into the chat pod without waiting to be chosen by the teacher to respond to the question”. The student elaborated that in their mainstream classroom they always put up their hand to answer every question and they always hoped the teacher would choose them. When the teacher chose another student instead and rarely them, they expressed feeling sadness as they “always knew the answer”. The online classroom afforded an area where students could “just blurt out the answer [typing] because we all know it, but we’re not being rude and talking over each other”. There was a palpable sense of relief in this student’s facial expression and voice tone during interview when describing what it felt like not to have to wait to be chosen, nor receive negative comment from their classmates because they “always knew the answer”.

Many students during interview described the positive experience of attending the residential school (“camp”) each school term. One Year 9 student described what it felt like to be able to sleep in dormitory-style accommodation with her VSSSP friends. “We share book titles and other extra-curricular experiences such as science workshops along with hair styles and music; camp is where I feel I can actually be my whole self, my actual self, and not keep back parts in case I’m judged to be uncool”. This comment corroborates the point above, that the VSSSP helped students avoid the “forced-choice” dilemma.

When the question about what happens at the residential school was asked during interview, without fail, students broke into a wide grin. Body language, facial expression and voice tone all pointed to a very positive thought process. One student described the competition that was held between staff and students at the last residential school of the year: “this year we did a couple of indoor sports then limerick writing. The teachers thought they were pretty good but we students won! It was only by a point but it was a win nonetheless”. Another student spoke of a different year when the student–staff competition involved an indoor sport, a trivia quiz and a drama improvisation session. Throughout the description, the student smiled and laughed at the memory.

It was clear through survey and interview that the vast majority of staff and students at the VSSSP felt a very positive sense of belonging. This positive sense met an essential affective human need and encouraged the individual to reveal more of their natural personality. The sense of belonging reported by participants is one aspect of the value of the provision.

## 5.2 The Nature of the Individual



Throughout the data collection phase of this research, a common theme appeared that the nature of the student was a significant factor in the value or otherwise of the virtual provision. Elements in the nature of the student that were consistently raised by students, parents and their teachers included organisation and time management capability, task orientation, intrinsic motivation by the student, and the capacity to be an independent learner. Flexibility and adaptability of the student

were also a common theme and these characteristics will be discussed in the section headed 21st-century Skill Development.

Results from the VSSSP were consistent across students, parents and staff that the intrinsic motivation of the student was central. Interview and survey question responses from students, parents and staff consistently mentioned that the VSSSP was not for everyone, that it required a student with a sense of determination to meet challenges, then persist. One student at interview described how they were “not very smart when they were in Kindergarten” [age five years] but that now they were “very smart because they had worked really hard”. This epistemic belief in an incremental theory by the student is indicative of alignment with Dweck’s (2009) research that says a growth mindset is essential to build capacity.

Results from parents and students indicated that for those gifted students who were intrinsically motivated to learn, the VSSSP was a welcome respite from their mainstream classes. Students consistently referred to off-task and at times disruptive students in their mainstream classes and welcomed the virtual academically selective environment where, according to them, everyone wanted to learn. These comments were not made in direct response to a question about the VSSSP meeting the students’ academic needs but they do indirectly provide a positive response to such a question and thereby to the main research question about the value of the provision.

Conversely, students who were not intrinsically motivated to learn struggled in the virtual environment. A large proportion (more than 80%) of parent, student and staff free text extended responses related to the need for every student to be a motivated and engaged learner. Many parents commented in the survey along the lines of “no matter how clever your child is, if they are not motivated to learn and are not a self-starter, then this [virtual] program is not for them”. One staff member in an

interview commented on a student who was, in their eyes, extraordinarily gifted. They commented that the student had been identified as having a reading age of 12 years when they entered Kindergarten at five years of age. The staff member related a conversation they had with the student where they had asked why the student had not submitted a piece of [Year 7] work in a timely manner. The student responded that they had covered that topic when in Year 4 so felt there was nothing to be gained by completing the work again. At no stage did the student reveal that they had mastered the content already despite extensive pre-testing of the class by the staff member. Further questioning of the parents of this student by the staff member revealed that the local school had done very little to address or take advantage of the student's advanced reading capacity throughout the preceding seven years of early schooling. The parents revealed they had pursued a battery of tests for potential learning difficulties such as dysgraphia, but none was found.

All stakeholder groups in this research support extant literature with regard to the need for enabling skills such as time-management and organisation. Interview comments from parents include comments such as “getting assignments in on time was a real challenge in the first term but things seem to have improved since then” and “in the beginning, it was very confusing – my child did not know what they were meant to be doing and this caused quite a bit of stress until they got themselves organised with the support of the VSSSP staff”. Experiences within the VSSSP allowed students to develop skills that would transfer to their mainstream classes, where time-management and organisation are also important.

Teachers reported in interview and in extended response sections of surveys, that assistance with organisation in the first term a student joined the VSSSP was essential. Reference was made by several staff to the manner in which a student's

time was scaffolded: “There was a need to scaffold the time students spent on each Key Learning Area (KLA) as they could spend all their VSSSP asynchronous lessons just on their favourite subject if we did not assist them to even things out”. Senior Executive staff spoke about colour coding the synchronous lesson times for each of the three KLAs delivered by the VSSSP, then balancing out the rest of the timetabled VSSSP lessons using the same colour code to ensure an equal amount of school time was spent on the three subject areas. The colour coding meant there was a visual reminder that could be displayed on a wall planner at home and at school to remind students about the need for balance and as a way to encourage effective time management. Staff also commented that an annual assessment calendar was published at the beginning of each school year that allowed students to know in advance when formative assessment tasks would become due. This scaffolded student preparation time for assessment tasks and allowed plenty of time for students to ask for assistance if they required it. Involvement in the VSSSP allowed students to develop in these essential ways, which helps to understand in what other ways the VSSSP may have helped the student or staff member to develop.

Parents also spoke in interview and in survey extended responses about the manner in which a 12-year-old student (average age for Year 7, the first year of secondary schooling in NSW schools) was asked to arrange their time in a similar manner to a Year 11 or 12 student (17–18 years of age in NSW schools). The vast majority of parents who took part in the research were pleased with the increase in skills of independence their child demonstrated after a single school term in the VSSSP where they were responsible for how they spent their school time when there were no synchronous lessons on and the students had to plan the use of their own lesson time. Parents who reported they were not pleased with the increase in their



child's skills of independent time management also reported that their child took advantage of the time to undertake off-task behaviour such as playing games on their computer. Senior Executive staff reported that this was the most common abuse of the online learning environment – students bringing computer games to school, which was an absolute breach of the Acceptable Use Policy signed by all staff and students. The reports suggested that only a very small handful of students took part in this off-task behaviour; however, it was acknowledged that the opportunity was there for any student, should they choose to do so.

Student participants reported that learning to manage their own time was the most difficult thing they did in their early days with the VSSSP. A common theme in interviews was that the need to balance time spent on each subject area did not come naturally, and that it took self-discipline to achieve it. One student commented in an interview: "I've been told how to spend every minute of every day at school since I was five years old – I love that I get to choose what to do now for part of each day". Students also commented on the opportunity to be off-task if they chose. The vast majority of students said they quickly overcame the wish to chat with their friends as the amount and level of challenge of the school work in the VSSSP mounted. Graphs of the student self-reported skills of management of time before and after exposure to the VSSSP (as shown in Figure 4.9), and management of unexpected events before and after exposure to the VSSSP (as shown in Figure 4.8), both indicate that students felt these characteristics improved over time. This is further evidence to assist with a response to research sub-question three about other ways that the VSSSP may have helped the student or staff member to develop. These results align with research by Dweck (2009) with high levels of self-accountability, the ability to recognise

strengths and weaknesses over time and the ability to think critically shown to be important for successful learning.

Motivation of the learner, specifically the gifted learner, has been well described in the work of François Gagné. This work is of critical importance to Australian schools as the Gagné Differentiating Model of Giftedness and Talent (Gagné, 2008) has been adopted by the Australian Curriculum, Assessment and Reporting Authority (ACARA, 2013) and as such, must be used by all schools to address student diversity, notwithstanding the variability in implementing this official policy (Merriotsy, 2017). Gagné's research indicates that there is a developmental process that needs to occur in order to transform potential natural ability (gifts) into competencies that can be seen and measured (talents), and within this developmental process intrapersonal catalysts such as motivation and intrinsic volition are critical. The concept of intrinsic motivation is addressed by both Dweck (2009) and Deakin Crick (2007) in addition to Gagné (2008). These authors suggest that it is necessary for a student to believe they can achieve, and at the same time recognise that achievement requires some effort.

With regard to the student described by the staff member who had a reading age of 12 in Kindergarten, research by Dweck (2009) and Deakin Crick (2007) would suggest that the lack of support for the student throughout seven years of early schooling had left the student with no capacity to develop study skills. Both authors maintain that study and learning are learned skills and without challenge this student had not had the opportunity to develop these skills.

Time management and organisation are described by Thomson (2010, p. 670) as critical to student success in an online environment. Without development of the necessary skills of prioritisation and task commitment, added to inherent volition

(Gagné, 2008), even the most gifted student cannot be expected to succeed in an online learning environment.

Teachers in the VSSSP described themselves as organised, flexible/adaptable, motivated, innovative and self-directed. These characteristics were consistently described by more than 80% of staff who took part in this case study, with one staff member referring to the effort they took to prepare lessons that would then be recorded, recognising that once the recorded lesson was uploaded to the LMS, it could be shared with an unknown audience, and the staff member wanted to ensure their work was exemplary. These self-identified characteristics align well with research by Bramwell et al. (2011) who found that successful teachers of gifted students demonstrated intrinsic motivation, hard work ethic, passion for their work, and preparedness to undertake academic risks in order to be innovative.

This section has explored the nature of the students and the teachers. Findings agree with extant research in that the virtual environment suits well organised, intrinsically motivated students and teachers. Students who are not self-disciplined or who lack intrinsic motivation struggle to succeed in the virtual learning environment regardless of their natural intellectual abilities. Students who do have intrinsic motivation were enabled by being in the VSSSP to develop time-management and organisation skills, which constitute one value of the provision.

### 5.3 Creativity



In this case study, the creativity of both teachers and students that has been considered is the little “c” variety as outlined by Merriam (2013). Teachers expressed and explored creativity in their approach to lessons and reported feeling as

though they could try new things such as new ways to assess mathematical knowledge by using different types of assessment tasks. This expression of creativity helps to understand all three of the research sub-questions about how or why being involved in the VSSSP made a difference, if indeed it did make any difference. In an interview, one teacher of mathematics reflected on a particular assessment task that required students to apply mathematics to an imaginary room makeover, another to build a board game using probability and yet another to explore methods to prove the size of a particular angle in a triangle. The teacher reflected that these practical applications of mathematics not only enthused students but them as a teacher as well. They reported feeling quite liberated once they realised they could gather data on mathematical mastery in a different manner from a pen-and-paper test, indicating one way that the VSSSP had helped them to develop as a teacher: “I actually felt the students had a much deeper understanding of the maths involved when they applied it to something they could see themselves doing”. Another way teachers spoke of applied creativity was the way they combined two subject areas of study to produce a single task for students to complete. An English teacher described the way they had worked on the literature techniques of advertising then had the students combine an advertising task to “sell the unsellable” from the Periodic Table of the Elements as defined by the science staff of the VSSSP. The student teams had to make a pitch to advertising executives (English teachers) to sell the unsellable elements. Science staff attended the pitch to check for scientific accuracy of the pitch. Laughing while reflecting during interview, the teacher spoke of enjoying the film made by a student, looking for the element Selenium in the supermarket. Some students had added a creative flair by printing their own t-shirts with a production company name made from the first two letters of each of the teacher names. The teacher in an interview

reflected that the open-ended nature of the task, coupled with the solid grounding in literary and scientific techniques, gave the students confidence to be as imaginative as possible with their response. These experiences illustrate development of both teacher and students when they incorporated creativity into their teaching and assessment.

It is arguable that without the VSSSP, the stimulus to experiment with different ways of assessing might not have occurred, as the staff themselves indicated. One staff member took the concept of a cross-KLA task back to their local school and arranged a whole-of-Year task for Year 10 that allowed collaboration between learning areas not included in the VSSSP, such as Human Society and its Environment (HSIE). This is another example of how being involved with the VSSSP encouraged growth in the student or staff member and facilitated application of skills or knowledge gained in the VSSSP in the local school environment.

In extended response questions in the survey, staff commented that they felt they were encouraged to try new things and that the VSSSP was a flexible place that encouraged them to think of new ways to meet mandatory assessment requirements. One teacher commented that they were unsure if it was because the students were so capable, they would make a reasonable attempt at anything they were asked to do, or if the combination of staff from different local schools energised them to apply some creative flair: “It could be that when one does not have to interact face-to-face on a daily basis with people, some of the mystery that we all employ when we first meet people is preserved, and this may encourage us to do things we may not feel comfortable doing at our local school”. Another teacher commented in an interview that the culture of the VSSSP was one of support for the individual and the team “...we were encouraged to try new things by senior executive and certainly I felt

valued as both a team member and an individual by senior executive”. Self-sustaining practices of flexibility, confidence, curiosity and self-motivation are cited by Tan (2015) as essential to promote creativity in individuals and to embed it in the school culture.

Parents commented that they found much of the school work completed by the students required quite a bit of creative flair and for the students to “think outside the box more”. One parent commented in the survey that their child did not enjoy having to complete an artistic task as part of their mathematics work as they just preferred numbers and science. The parent then followed that comment with another that once their child had seen what others had done, they felt inspired to apply themselves a bit more to a field that they did not normally enjoy. Modelling is an important way to show students acceptable standards and possible completion methods (NSW DEC, 2015), and modelling in the VSSSP achieved this goal.

Students reported that the VSSSP environment allowed them to showcase their creative flair and to think outside the box for solutions to problems posed. One student commented in an interview that they found the tasks in their mainstream classes very boring after being in the VSSP for a few years. When asked to expand on this remark, the student stated that perhaps that was not a fair comment as their mainstream class was of very mixed ability so tasks had to be able to be completed by everyone. This comment supports research by VanTassel-Baska (1993) that differentiation of work is essential to meet the learning needs of all students. It also supports the claim that the VSSSP, through differentiated teaching, allowed students to develop their talents, and their staff to develop their teaching skillset, which helps to understand the response to the first research sub-question about ways that the

VSSSP might have supported learning and teaching of gifted students in rural, regional and remote areas.

Creative teachers and creativity in teachers is an expanding area of research. Chan (2011, p. 163) reports that skills in creativity and problem solving rated an average of 4.2 out of a possible 5, with a standard deviation of 0.96, for gifted-student perceptions of the desirable qualities of teachers. This result was the highest average score and the lowest standard deviation for all characteristics reported in Chan's work. Bramwell et al. (2011) expanded on the personal characteristics of creative teachers, stating that the interpersonal characteristics of self-direction, universalism and stimulation were desirable characteristics displayed by creative teachers and enjoyed by gifted students. Beghetto and Kaufman (2009, p. 299) expanded on works from the 1950s suggesting a link between creativity and learning. In these works a constructivist model of learning (where students make meaning from everything they have learned and experienced in a non-linear and linear fashion) rather than an accumulative model of knowledge (where students store information that has been transmitted by a teacher then stored in their memory unchanged), was found in many gifted students. This use of imagination to make connections between seemingly disparate information to build or construct new knowledge, was a feature in the findings of Beghetto and Kaufman (2009).

This section has discussed how a culture of creativity was fostered within the VSSSP, how teachers and students embedded creativity into their daily work and how this culture of creativity empowered individuals to take more academic risks in order to be innovative. The findings align with extant research that was reviewed during the literature review and describe another aspect of the value of the provision.

## 5.4 Quality Teaching



The NSW DoE states that teachers who have high expectations of students have a better outcome in terms of their students' achieving to the best of their ability (NSW DEC, 2015). Quality teaching is mooted to include intellectual rigour of work offered to students to match their cognitive ability, a learning environment that supports all learners and demonstration of the significance of learning to the learners involved (NSW DET, 2003). Teachers in this case study reported in interviews that they pitched the work consistently one to two years above the enrolled grade of the student cohort after conducting a pre-test to ascertain understanding. In an interview, one teacher reflected on their first lesson with their Year 7 VSSSP class where states of matter were under discussion. Previously the teacher had found in their mainstream classes that students just out of primary school were familiar with three states of matter (solid, liquid and gas) but could not describe the arrangement of particles in each state very well. In their first class with Year 7 science in the VSSSP, the teacher was very surprised that not only could the students describe particle arrangement of three states of matter well, they could also comment quite freely on other particles (plasma and Higgs boson particles). This realisation prompted a complete rewrite of the intended learning journey for the remainder of the topic. The ability and willingness to adapt an intended learning journey to suit the learners whilst ensuring mandatory requirements are met is the hallmark of quality teaching as described by the NSW DEC (2015) where the use of data to inform practice is essential to a quality classroom. Other examples of high expectations were discussed by other teachers in interviews. They mentioned scaffolding essay writing in English



and supportive peer comments as part of feedback for classwork undertaken. These strategies of introducing critical thinking with regard to writing samples afforded a way to demonstrate what students needed to do to show mastery at the level required (NSW DEC 2015) and afforded an opportunity for meaningful feedback to students about ways to improve. This explicit teaching of content and positive classroom management were designed to build student wellbeing and to make learning visible (Hattie, 2009). Such explicit strategies allowed teachers to support the learning needs of the students in the VSSSP while, in addition, the focus on student wellbeing targeted their affective needs. This provides support and understanding for the main research question as well as the first research sub-question.

A quality classroom was sometimes difficult to achieve due to the unreliability of internet connection experienced in some areas. All stakeholders commented that when they could connect, lessons were well prepared, interesting and challenging. However, the connection sometimes could not carry video/voice which meant the student and teacher were limited to written chat during synchronous lessons. In an effort to ensure all students could reflect on lessons they may have missed due to connectivity issues, teachers reported in interviews that they would sometimes record their synchronous lessons for later viewing by students. This strategy was also reportedly used when a concept was found to be particularly challenging for a number of students, despite connectivity. Staff commented in interviews that when they did record lessons they felt the need to check the lesson quite carefully to ensure everything was correct. One teacher commented that once a lesson was online, it could go anywhere so they wanted to ensure their craft was solid. This behaviour aligns with research by Bramwell et al. (2011) that successful teachers of gifted students are hard working.

All participant groups in this case study spoke in interviews and survey extended responses about the strong rapport developed between students and teachers in the VSSSP. Rapport supports the quality teaching element of an inclusive classroom where all learners feel valued and their learning needs are met (NSW DET, 2003). In this case study, the rapport reported by all participant groups appeared to be a genuine influence on satisfying the affective and learning needs of gifted students, and helps to respond to the main research question about what ways, if any, the VSSSP supported the affective and educational needs of gifted students in rural, regional and remote areas. Senior Executive staff reported that part of the induction process for new staff was training in gifted education strategies. This approach is recommended by several researchers; Kronborg and Plunkett (2012), Schmitt and Goebel (2015) and the seminal work by Geake and Gross (2008) all mention the positive communication between trained teachers and gifted students that leads to a supportive learning environment.

The culture of the VSSSP appeared to have been deliberately crafted by senior executive in the early days of operation according to analysis of interviews with these senior executive staff. Measures included the deliberate creation of a virtual playground for student–student interaction to support the affective needs of students, teacher development in gifted education strategies to support teaching and learning of gifted students, and an absolute expectation that no student would be asked to “tread water intellectually”, which helps to understand and respond to all three research sub-questions. This last term [tread water intellectually] was mentioned by several staff during interviews. Its meaning, they explained, was that there was an expectation that all students would be presented with new areas of learning in each lesson and staff thus had to develop a close professional connection

with the students in order to use any particular interests or hobbies as part of extension work that might be undertaken. This personalisation or individualisation of learning appears to have been a critical management strategy deliberately implemented by senior staff from the outset of the VSSSP in order to build a school culture that supported gifted students by meeting their affective and educational needs, by supporting the learning and teaching of gifted students in these areas.

This section has discussed quality teaching as it relates to this case study and the research questions. All participant groups agreed with extant research that a supportive classroom environment, clear articulation of requirements and expectations, in addition to teacher development in gifted education strategies and the affective needs of gifted students contributed to a quality teaching environment at the VSSSP and therefore to the value of the provision.

## 5.5 Skill Development



Results from all participant groups in this case study were overwhelmingly positive that the VSSSP had helped to build skills in the use of technology, digital presentation skills and adaptability to unforeseen events, which is also described as flexibility. This is one of the ways that the VSSSP helped to develop the student or staff member. One staff member in an interview reflected on the first residential school. At this residential, students had been allocated dormitory rooms but due to a problem discovered at the last minute, rooms had to be rearranged. The staff member reflected on one student in particular who seemed to be extremely concerned, for quite a period of time, that they did not know where they would be sleeping and hence where to leave their bag. At the next residential school, that same student

happily threw their bag onto a pile of others and went off to chat with friends. The teacher commented that the student seemed to have developed quite a tolerance for ambiguity and unforeseen events that was not present at the earlier residential school. This development of flexibility, or adaptability to change, was seen by the staff member as positive 21st-century skill development that contributed to the value of the provision.

Students reported that they felt they could cope with unexpected events better after they had been with the VSSSP for a while. This outcome may have been due to the supportive culture at the school as reported in extended survey responses, or it may have been due to the manner in which the lesson schedule or timetable changed so often. As the VSSSP had a zero footprint approach to timetables, if any of the 28 partner schools changed their timetables because of a change in enrolments or a change in staffing at the local school, there was a domino effect onto the timetables [lesson schedules] and class lists in the VSSSP. Both students and staff stated they became used to the many changes over time and took them in their stride, although all staff and students stated in interview that while they would prefer more stability, they recognised that for the VSSSP to operate as it had been directed to by senior Western NSW Region management, timetable changes and class list changes were inevitable. One staff member commented in interview that the regular timetable changes made them realise that it was communication or connection that was important, and so a rapport had to be developed with the entire cohort, not just their class or “pod” as they called it, as the list of students in the pod could change. Adaptability, or the capacity to change or be flexible, are seen as essential 21st-century skills.

The necessary timetable changes may have contributed more to the flexibility and adaptability of both students and staff as they ensured that staff communicated and collaborated very regularly when there were class changes. Teaching and learning programs, assessment tasks and activities were devised collaboratively by staff in the semester preceding delivery. This practice supported regular changes as all staff had an in-depth knowledge of what was required, by when, and which class activities were essential to building student knowledge as well as opportunities to personalise the lesson delivery. As students completed common summative assessment tasks in each Year group and KLA, there was no advantage or disadvantage by being in any one class or pod. Teachers spoke in interviews of enjoying the collaborative development of resources, activities, tasks and programs as being some of the best professional learning they had undertaken, which helps to understand other ways that the VSSSP may have assisted with development of the student or staff member: “By adding our experiences together, we were able to innovate in many more ways than just by ourselves”. Agility, or the capacity to move quickly [to adapt to new circumstances] is seen as an essential 21st-century skill.

Students were set tasks that required them to collaborate with others in order to produce a result. One such task was to rewrite a scene from a well-known Shakespearean drama, then perform it at a residential school in front of the remainder of the cohort. Staff commented in interviews that this task really pushed the students to collaborate at a distance and encouraged development of skills such as delegation, accountability and problem solving. It appears that so much of the learning at the VSSSP was inherently designed to emulate future 21st-century environments that it was inevitable students and staff would build these skills even further and is additional evidence to provide understanding to research sub-question three which

refers to the other ways that the VSSSP may have helped develop the student or staff member.

Principals commented in interviews that they often could not believe what they saw the students or staff achieve. More than one principal commented that they wished they had more staff or even one staff member who was part of the VSSSP as they recognised something special happened to the professional confidence of the students and staff at their school when they became part of the VSSSP. This feedback helps to understand research sub-question two about how the VSSSP may support students or staff in their mainstream classes. This outcome was not consistent for all students, as the nature of the student defined whether they stayed in the virtual program or returned to their local cohort, but for those who did stay, principals commented that they could see the benefits in a number of intangible ways, including confidence and an appearance that the student or staff member seemed “comfortable in their own skin”.

All participant groups showed a very positive increase in time-management skills, which is more evidence to respond to research sub-question three about how the VSSSP may have developed the student or staff member. Students reported that they managed their time much better after they had been in the VSSSP and this view was strongly supported by parent respondents. Staff also reported that they managed their time better after they had been with the VSSSP. Extended responses as to why that may be the case included the short synchronous lesson time (20 minutes as compared to up to 70 minutes at a local school), and the level of challenge of the work. Students commented that they could not afford to procrastinate as they knew there would be more challenging tasks in the next lesson, so completion of activities in a timely manner was essential.

Staff commented that they sharpened their delivery skills when they knew they only had 20 minutes to impart new knowledge or directions for class activities in their synchronous lessons, which is evidence for how the VSSSP may have supported the development of the student or staff member. Many staff commented in extended responses that they encouraged follow-up emails from students if they had not understood something in a synchronous lesson. According to staff, this invitation personalised the learning even further for each student but also provided a scaffold for students to develop independence over time as they became more confident in their own problem-solving abilities.

Twenty-first-century skills are defined in the literature as a collection of related skills, work habits and character traits (Saavedra & Opfer, 2012) that may promote success in a future workplace where the nature of the work is as yet unknown to society. They include skills such as critical thinking and problem solving, collaboration and leadership, agility and adaptability, initiative and entrepreneurialism, effective oral and written communication, accessing and analysing information, and finally, curiosity and imagination.

This section has explored the development of 21st-century skills, and other skills, in staff and students at the VSSSP. The results provide evidence to respond to research sub-question three about how the VSSSP may have helped to develop the student or staff member. Overwhelmingly, both staff and students reported that they had better skills with technology in general, better digital presentation skills, could adapt to changes more quickly and manage their time better after they had been with the VSSSP. Parents and partner school principals supported this view. In summary, the VSSSP appeared to enhance the development of collaboration, flexibility,

adaptability and problem solving. Other 21st-century skills such as creativity have been discussed in other sections.

## 5.6 Transfer of Skills to the Local School

### Environment



This final discussion section of the outer cells of the research model will discuss if, or how, skills learned in the VSSSP were able to be transferred back to the local school environment and will provide evidence to respond to research sub-question two which refers to any ways that the VSSSP might have supported students or staff in their mainstream classes. Student and staff perspectives will be described.

Students responded positively in extended response survey questions. Responses referred to engagement at school as well as application/effort, multitasking and communication. Students reported that they found it easier to understand what was required in an assignment at their local school after completing some assignments in the VSSSP. The responses referred to a better level of understanding of what was required from them. One student responded that the VSSSP had taught them “the way to multitask effectively”. Another student reported that they “had learned the value of hard work, commitment and dedication”. Several students referred to the fact that they felt more empowered to undertake tasks independently as they had been taught how to do so in the VSSSP. Others commented that they now had the confidence to hand in work that was different, as they had been encouraged to think outside the box in the VSSSP. Another comment referred to having the confidence to hand in work that was above and beyond what was specifically required: “The VSSSP has taught me that it is ok to be different, and



to exceed expectations, rather than do the bare minimum”. All these comments support research by Dweck (2009) of the importance of a growth mindset and Deakin Crick (2007) about the nature of the learner. They also support Gagné’s 2008 model of giftedness and talent that expands on the impact of the milieu a student is immersed within. By finding others, like themselves, who have a passion to learn and to complete work to the best of their ability, with teachers who guide and support academic and creative growth, students appear to have been empowered to unleash their creative potential (Chandra Handa, 2015) and have taken this skill back into their mainstream classrooms.

Staff reported a transfer of many skills back to their local school after being part of the VSSSP. They mentioned an improved understanding of their subject syllabus as well as moderation of assessments to ensure consistent teacher judgement. An important skill that was transferred was the ability to design open-ended activities and tasks for their local classes that could help reveal gifted students at the local school who were not part of the VSSP but who deserved an appropriate curriculum like any other learner. Senior Executive staff of the VSSSP reported during interview that with the cap on numbers for the VSSSP set at 30 per year cohort, there was no way the VSSSP could cater for the actual number of gifted students within Western NSW Region. With a school population of over 17000 students at the time of data collection, it could be construed that there were roughly 1700 gifted students, or 10%, in the rural/regional/remote area (Gagné, 2008). With the entire VSSSP cohort set at 120 maximum, the majority of gifted students were potentially still at the local school only. These figures highlight the importance of the transfer back into the local school of skills suitable to meet the learning and affective needs of gifted students, by the VSSSP staff who also worked at their local school.

This indirect professional development and skill-set development has the potential to have the most impact to gifted students in rural, regional and remote areas and supports findings by Geake and Gross (2008) in addition to research by Troxclair (2013), which are both based on the early work of Gagné and Nadeau (1991). Teacher development in gifted education strategies has been shown time and time again to be a very effective way to meet the needs of gifted students.

Teachers also referred to changes in their instructional practice that were positive, including a self-reported improvement in questioning skills, application and implementation of critical and creative thinking skills and an ability to better differentiate teaching programs to cater for gifted learners. This development of the skill-set of teachers helps to respond to research sub-question three. As all staff were also a member of their local school faculty, they made contributions to local programs with their new skill-set adding to the capacity of the local school to cater for their own gifted and/or talented students, demonstrating how the VSSSP supported them in their mainstream classes.

Regular use of technology in the local school classroom and more confidence in using ICT were reported by the majority of staff and indicated they had developed in some way. In interview, staff expanded on this finding to say that their improved confidence had other benefits such as better classroom management as they did not feel stressed when using technology with their local school students. Staff also stated that they had learned to trouble shoot with technology a little so they felt more confident taking their local school classes through a task that required ICT use.

This section has discussed the ways that staff and students transferred skills they built and developed in the VSSSP back into their mainstream classrooms and provides some support to build a response to research sub-question two. Students

reported increased engagement in all subjects and a more developed creative and critical thinking skill-set. These challenges allowed them to apply themselves more to local classes and tasks which, as reported by students, improved their overall achievement and satisfaction at school. Staff reported being a more confident teacher in their local classrooms, resulting in improved classroom management and improved differentiation of the curriculum to meet the needs of all learners in comprehensive classrooms at their local school.

## **5.7 The Value of the Virtual Selective Secondary School Provision**



The middle hexagon in the model for this case study is the value of the VSSSP as perceived by the stakeholders and will reveal information that will help form a response to the main research question. Results and discussion so far have been reported under the theme headings as defined in the research model shown in Figure 3.2, and in the coloured versions for the different participant groups in Figures 3.4, 3.5 and 3.6. This section will report on perceptions of value in the area of academics, engagement, enabling skills and the transfer of skills or materials to the local school of the participant teacher or student, perceptions that have become apparent during analysis of the data collected and application of the research model. In this section, the response to the research questions will be elucidated in a general manner and in Chapter 6, the findings will be described clearly. As a reminder, the research question is “In what ways, if any, was the VSSSP valued in terms of meeting the educational and affective needs of gifted secondary school students in

rural, regional and remote areas?”. Sub-questions that will help describe any transferable value, or not, of the provision include:

1. In what ways, if any, did the VSSSP support the learning and teaching of gifted and talented students located in rural, regional and remote secondary schools in NSW?
2. In what ways, if any, did being involved with the VSSSP support the students and staff with their mainstream classes?
3. In what other ways, if any, did being involved with the VSSSP develop the student or staff member?

### **5.7.1 Academic Value**

Academic value was reported by all participant groups as being very positive on a number of levels. First, students and parents reported that the level of challenge in daily activities and assessment tasks was sufficient to suit the learning needs of gifted students. Second, data collected from external tests of achievement over three consecutive years showed that the students were at the same level as their metropolitan selective school counterparts in the Year 8 science test ESSA (as shown in Figures 4.34, 4.35 and 4.36) and had progressed at more than twice the expected level for many starting scores in Reading and Numeracy as measured by NAPLAN (as shown in Figures 4.31, 4.32 and 4.33). These external tests provide some independent validation of reported academic value as they are undertaken by all students in NSW schools.

Other value reported was the increased academic risk-taking for students to attempt something without fear of being harassed or bullied for “always knowing the answer” or for fear of not giving a correct answer. The culture of the VSSSP appears

to have been central in creating a supportive academic environment where students could postulate a response without fear of ridicule (NSW DET, 2003).

Students also reported becoming more independent learners the longer they stayed with the VSSSP, which was seen by parents as positive academic progress. In interviews and surveys, parents commented that the student-centred approach at the VSSSP appeared to meet the learning needs of their child as they could make connections themselves which resulted in deeper understanding. This result aligns with research that advocates a student-centred approach as better for gifted learners (Chandra Handa, 2009).

Teachers also reported academic value including deeper understanding of the syllabus content they taught, greater innovation in teaching resources they created and pleasure at seeing the independent study skills of the students improve over time. Teachers also reported that they felt the assessment task variety, level of challenge and open-endedness improved their “teacher toolbox”. In particular, teachers reported that without the VSSSP they may never have had an opportunity to teach a cohort of gifted students due to their inability to move from their rural location and the small population of students at their local school.

In interviews, teachers expanded on comments such as how working in a team enhanced their subject content knowledge, teaching practice and development of resources. This development in turn led to academic achievement by students as shown by external tests of achievement. Teachers commented often on the manner in which they had been able to craft differentiated lessons and resources, have them critiqued by their colleagues and attempted by students whom they may not have seen in as many numbers at their local school. From the teachers’ view, these professional opportunities added to their instructional practice capability. Teachers

also commented positively on the opportunity to prepare a class to take part in external competitions such as the annual rural and regional competition “Heywire” run by the national broadcaster ABC [[www.abc.net.au/heywire/](http://www.abc.net.au/heywire/)]. This competition aims to give students in rural and regional areas an opportunity to tell their stories about living in a rural area. [The national competition for young people aged 16–22 has one winner from each region in the state, who then attends an all-expenses-paid youth leadership summit in Canberra, the national capital, with all other regional winners from across Australia]. At the winners’ summit, students prepare a brief for members of parliament and government departments with suggestions for how to improve the lives of young people in rural and regional areas of Australia. Students at the VSSSP won in their region of NSW and attended the youth summit, on at least three occasions during the period of data collection for this case study.

This section has discussed the academic value of the VSSSP as perceived by the research participants in this case study. Perceptions aligned with each other, namely, that the VSSSP afforded unique academic opportunities for both teachers and gifted students in rural, regional and remote parts of NSW. The exception was when students chose to be off-task and to abuse their access to technology by spending time playing computer games during school time. The number of students involved in this activity was low, but the impact was mentioned by all participant groups as being of concern.

These findings align with extant research in several areas. These areas include the need to have teachers trained in gifted education strategies (Geake & Gross, 2008; Kronborg & Plunkett, 2012); the importance of grouping gifted students together with similar-ability students for at least some part of each day (Rogers, 2007); and the need for gifted students to complete a differentiated curriculum that

has been deliberately designed to meet their level of curiosity, complex problem solving and ability to make connections (VanTassel-Baska, 2005).

### **5.7.2 Engagement Value**

The vast majority of comments were positive with regard to increased engagement due to enjoying interactions with like-minded people. This perception was true for both staff and students. Students spoke of looking forward to their virtual lessons where they could “blurt out the answers by typing in the chat pod” or showcase their knowledge if there was a topic of particular interest to them. Parents confirmed this engagement by referring to the manner in which the student looked forward to going to school each day at their local school and to the residential school for the VSSSP.

Students commented regularly on the way they enjoyed the challenging nature of the work they were given in the VSSSP, with many students comparing the VSSSP classes to their local school classes unfavourably. Many students commented on how they really enjoyed being with a group of students who all wanted to learn and be challenged in their thinking, in contrast to their local school classes where some under-engaged students chose to be disruptive to all learners in the classroom. Students also commented regularly on the pace of the work, particularly when a teacher chose to cover subject content quickly to allow time for more in-depth studies at a higher level or a level that was not included in the syllabus at all. A senior officer of the VSSSP commented in an interview that if all knowledge was this [they then made a semi-circle shape in front of themselves by sweeping their right arm from full left to full right across the front of their body] the syllabus content for any subject area is just a thin slice of the potential half pie. The senior officer went on to say that there was a vast array of great knowledge to be offered to

students to facilitate deep learning and deep understanding (NSW DEC, 2003) that did not fall within syllabus guidelines. This approach seems to have been strongly adopted by teachers as they covered syllabus requirements quickly and then went on to more challenging or current areas of their particular KLA. This pattern seems to have been appreciated by students at the VSSSP who commented on the interesting work that they enjoyed so much.

Staff responses in surveys and interviews referred to how much they enjoyed preparing work and activities for students who were so engaged in learning. Teachers responded that they felt enthused to make the extra effort to find or create resources that were highly nuanced as the students appreciated and identified the nuances, often raising deep conversation topics in the synchronous lesson or in asynchronous discussion forums that were available in the Learning Management System after a synchronous lesson. Partner-school Principals supported the view that teachers were very engaged after spending time with the VSSSP and they encouraged their staff to speak about their experiences at regular staff meetings in an effort to share knowledge.

Parents responded that their child was keen to go to school when they were part of the VSSSP, which in some cases was a complete turnaround for their child. A small number of parents [2] reported that their child had been quite unhappy in their local school until they had joined the VSSSP as their child had not necessarily been able to find friends easily at the school. This issue is supported by Gross (1989) who reported the forced-choice dilemma faced by some gifted students between intimacy of friendship and academic achievement, a choice not needed in the VSSSP. Parents also responded that being with other capable students showed their child that they needed to apply effort to do well: “this was the wakeup-call my daughter needed to



not rest on her laurels – there are plenty of clever people out there, just maybe not at her school in large numbers”.

Staff at the VSSSP spoke of a practice to praise and reward effort as well as personal best achievement in an attempt to show that “your best, not *the* best” was the most anyone could hope to achieve. Documents for parents that were supplied on enrolment at the VSSSP spoke of “personal best” as the aim of the VSSSP for each student. Senior executive staff explained in interviews that this tactic was a deliberate attempt to mitigate perfectionist tendencies that are sometimes quite prevalent within populations of gifted students (Silverman, 2007) and that may have a positive or negative impact (Friedman-Nimz & Skyba, 2009).

Students and parents spoke in interviews and survey responses of the ability to submit drafts of work for feedback before final submission. This practice was encouraged by teachers at the VSSSP and appreciated by many students. The chance to refine work, particularly essays required for English, was taken up by many students, so much so that staff reported that in order to manage expectations, they had to put a limit on the number of drafts submitted and the time before the final version was due. Senior executive reported in interviews that they instructed staff to form and communicate a personal boundary of availability of their expertise online. They had suggested no online communication with students after 4.30 pm on weekdays and limited or no availability over the weekend as they had noticed that if allowed, students would send emails nearly 24 hours, seven days per week asking questions about their school work. Staff commented that they initially found the engagement by students in their subject area intriguing and rewarding, but quickly realised they, as the adult, had to set boundaries for acceptable contact times which supported a work–life balance for both the student and the teacher.

This section has expanded on the engagement of staff and students at the VSSSP. All participant groups aligned with each other and reported that students and staff felt more engaged at school once they were within the VSSSP as well as with their local school. For students, this engagement was reportedly due to an appropriate level of challenge and pace of work offered. For teachers, it was reportedly due to having learners who really wanted to learn. Both groups appreciated the feeling of a close connection online regarding school work. This engagement may also have been due to an environment of personal best, rather than the best (Martin & Elliot, 2016).

### **5.7.3 Enabling Skills**

Throughout survey extended responses and interviews, enabling skills such as organisation and time management were mentioned regularly by all participant groups. Many staff commented that the “Stage 6 (Year 11 and 12) approach to assessment” had never been used with Stage 4 (Year 7 and 8) and Stage 5 (Year 9 and 10) in their experience before and they were pleased with the manner in which it built accountability within students. The VSSSP published an annual assessment calendar so the students could see well in advance when major tasks were due. Staff commented that this calendar was to facilitate student involvement in a wide variety of pursuits. Gagné (2008) refers to students having the potential to be gifted in more than one area of human endeavour. Staff stated that students in the VSSSP were operating at state level competition or higher in pursuits such as music (orchestra/ensemble/band), sport (football/ bull riding/ equestrian/ basketball/ netball/ dance), debating, creative writing, robotics and chess to name a few areas. The VSSSP chose to acknowledge achievement of students in their extra-curricular pursuits even though they were completed as a member of their local school or as an individual in the community. The intention, according to staff, was to celebrate effort

in its many forms. At times, students negotiated different due dates for major assessment tasks if they also had a major extra-curricular event on at the same time, generally choosing to submit at an earlier date. Staff stated that they felt this approach encouraged students to be accountable in meeting all their responsibilities and to plan ahead.

Another enabling skill was that of time management. By treating the students as learners, rather than as young children, staff reported that they were able to conduct conversations with younger students about due dates for assessment tasks and weekly work activities as if they were speaking with a Year 11 or Year 12 student. Parents commented that the organisation and time management required of their VSSSP student was similar to that of older siblings who were completing senior years of schooling. Some parents reported that their child struggled in the early days of the VSSSP but that with perseverance, their child eventually got into an acceptable rhythm. Scaffolds such as the colour-coded lesson schedule to allocate equal time to each of the VSSSP subjects also assisted students to manage their time in an equitable manner. An extended response from one Year 9 student sums up the sentiment:

The VSSSP has made me more organised and has helped me manage time more efficiently. Therefore, I no longer leave assignments until the last minute and I usually have them completed a few days before they are due. Without the VSSSP, I don't know if I could have achieved this. [Year 9 extended response in survey]

Technology skills were considered by all participant groups to be essential to the VSSSP and to a future workplace. Students reported that their skills with technology increased considerably in the VSSSP and parents supported this point of

view. This perception aligns with research by Chen et al. (2013) about the manner in which technology can support education of gifted students. A contrary point of view was expressed by participants in a small number of negative comments about technology as an enabling skill, where limited access to technology, or failure of technology to work at all in some circumstances, was very frustrating. Technology issues were due to outages by Internet providers or problems at a local school level. This finding aligns with experiences reported by Vu and Fadde (2013).

This section has discussed the development of enabling skills such as time management and organisation by students in the VSSSP as well as the enabling potential of technology. Overall results were that skills of organisation and time management improved over time in the VSSSP through a combination of effort applied and scaffolding offered by staff at the VSSSP. This development was seen as a positive attribute by parents, staff and students. Adept use of technology was also acknowledged and reliable technology was seen as essential and critical to success.

## **Summary of Chapter 5**

Chapter 5 has been a discussion of the results of this case study with mention of how these results align with extant research. Broad discussion that responds to the research questions has been provided. Chapter 6 will offer conclusions to the research questions, limitations, and suggestions for further research. It will also offer ways that this case study may be used to assist practice in schools.

## **Chapter 6: Summary and Conclusion**

The aims of this research were to find in what ways, if any, the virtual selective secondary school provision in the case study was valued, in terms of meeting the educational and affective needs of gifted secondary school students in rural, regional and remote areas. To reiterate, prior to this final chapter, Chapter 1 presented the context and background for the Virtual Selective Secondary School Provision (VSSSP) that formed the case study in this research. In order to support undertaking the case study of the VSSSP, Chapter 2 then analysed the literature to form broad themes for the research. These themes were around gifted education, technology in education, the nature of the learner, 21st-century skills, creativity, and education in rural, regional and remote areas. A clear gap in the literature was identified when there was no research available that described or reported on virtual selective school options for secondary school students where curriculum was replaced and offered in an online environment. The research questions that were developed through identifying gaps in the literature were presented. Chapter 3 provided information on general approaches to methodology and the specific method used in this mixed-methods case study, while Chapter 4 provided results of standardised external tests of achievement, survey responses and descriptive analysis of semi-structured interviews conducted with a range of research participants. Results from the different research participant groups of students, parents, teachers and local school Principals were compared, analysed and discussed in Chapter 5 with links to the research questions. In this final chapter, Chapter 6, the findings from this case study of the VSSSP will be summarised and presented in relation to the research questions. In addition, limitations of the research will be discussed and possible future research directions suggested. An important part of this final chapter will be

the discourse on possible implications of the research findings for practice in the classroom and of critical importance, the significance of this study will be explored.

## 6.1 Findings for Research Sub-Question 1

In what ways, if any, did the VSSSP support the learning and teaching of gifted and talented students located in rural, regional and remote secondary schools in NSW?

Learning and teaching of gifted students was supported in a number of ways. First, a strong sense of belonging was developed by the majority of students who were comforted by finding other people who were just like them. In some cases students had never had a like-minded friend in their local area due to the low population numbers in rural, regional and remote areas. Students in the VSSSP shared a sense of humour, a keen, almost urgent, need to learn and a sense of calm that they could be themselves without fear of being judged as “not cool” or “a nerd” for showing curiosity and a thirst for knowledge. Students were empowered to take more academic risks when they knew that their classmates and teacher would be supportive of their achievement, whatever the result. This attitude is summed up succinctly in the email signature of one of the VSSSP students that said “Shoot for the moon, if you miss at least you will land among the stars” [Year 10 student email signature]. The feeling of pleasure and pride at displaying work that was of a highly advanced level to classmates and staff who appreciated the effort, skill and nuances of this work, added to the positive self-concept reported by many students in the VSSSP.

Second, staff and students were able to apply creativity and innovation to their teaching and learning, which was not only encouraged but celebrated. In an academic environment where achieving personal best was spoken of freely and often, both students and staff felt empowered to challenge themselves whilst still meeting

mandated education requirements. Students learned at an appropriate pace for their cognitive ability and were encouraged to share other knowledge they had in a particular area of interest. Students were challenged appropriately in their daily work and assessment tasks, and were encouraged to work collaboratively at a distance. The potential geographic barriers were embraced by students as something to be mastered in a problem-solving approach. The students, facilitated by teachers, met in online spaces that were only just emerging for use in secondary schools at the time.

Third, appropriate challenge and pace in curriculum helped to address underachievement of some of the gifted students in the VSSSP. The strong focus on learning assisted to focus those students who had not been applying their full effort to their academic studies, but were coasting along without ever stretching themselves to learn more or do more than was absolutely necessary. Conversely, students who had a high academic self-concept were at times faced with the challenge of other learners who were academically equal to, or more able than themselves. Some of these students left the VSSSP and returned to their mainstream classes at their local school within one school term (10 weeks) of joining the VSSSP, apparently unable to cope with not being at the top of the class but somewhere in the middle. This sharp decline in academic self-concept in these students appears to be linked to resilience of the individual; however, as this case study did not have the scope to investigate resilience in any more than a cursory manner, such an investigation is an opportunity that could be the focus of further research.

Teaching gifted students was assisted by immersion of staff in an academically selective school environment. Due to low population numbers in rural, regional and remote areas, many staff had never had the opportunity to teach a whole class of highly academically able students. For female staff particularly, who may

have been appointed to a rural, regional or remote school straight from university, then married a local land owner/ farmer, the VSSSP meant a career opportunity that would not have been possible due to their inability to relocate the family to a metropolitan area that may have a bricks-and-mortar selective high school.

Teachers received development in gifted education strategies as part of their induction into the VSSSP then worked collaboratively to develop teaching resources both within and across Key Learning Area (KLA) groups. These resources were shared with every government high school in Western NSW Region allowing staff who were not part of the VSSSP to extend the manner in which they catered for the needs of gifted students in the local school, if they chose to use these resources in addition to materials they had created themselves.

Teachers also developed a strong sense of belonging with a group of like-minded people who were open to the challenge of teaching online using emerging technologies. They also appreciated being with other teachers who were keen to cater for the “best and brightest in the bush” by preparing appropriately challenging materials that were then delivered at an appropriate pace. The collegiality developed between staff was a notable phenomenon, along with the application of gifted education strategies to all their classes, not just those in the VSSSP.

In summary, learning and teaching for gifted students in rural, regional and remote areas of western New South Wales (NSW) was supported by the VSSSP by providing professional growth for teachers, facilitation of collaborative resource development, then delivery of curriculum that was appropriately challenging and fast-paced. Learning and teaching were also supported by catering for the affective needs of gifted students by facilitating the development of friendships despite vast geographical distances between students.



## 6.2 Findings for Research Sub-Question 2

In what ways, if any, did being involved with the VSSSP support the students and staff with their mainstream classes?

Students and staff both transferred a number of skills they developed in the VSSSP back into their local school or mainstream classes. Both used their increased skill development with technology to assist learning or teaching. Students developed more advanced time-management skills and the skill to decipher what was actually required to submit a quality response to an assessment task. Students also found that they were more engaged in their mainstream classes as they were actively looking for ways in which to extend their own learning. A certain amount of self-regulation of their learning was visible in the VSSSP students over time.

Some students found being part of the VSSSP did not support them in their mainstream classes at all and in fact in one or two cases it was detrimental. These cases were to do with local students being angry or confused at the VSSSP students not being present in all local classes. One VSSSP student reported feeling a bit left out when they returned later in the day to local classes as they had missed events that had occurred in their local friendship group. Other VSSSP students felt they had so much challenging work to complete for the VSSSP that they did not have enough time to devote to their local class work.

Teachers reported being invigorated to apply skills and knowledge to their local classes that they had learned as part of the VSSSP including planning the learning in such a way that unidentified gifted students in their mainstream classes might reveal themselves through completion of appropriately challenging activities. Teachers felt confident that they could cater for the academic needs of gifted students wherever they found them. In addition, teachers looked at the resources they had

developed for their local classes with new appreciation for what a quality task looked like. The VSSSP staff received intensive professional development as part of every residential school and this regular development was able to be applied in a different environment. Many VSSSP staff tried to replicate this collaborative resource development with local staff, with success in most instances. Many VSSSP staff found that their staffroom now contained a large number of people as the staff at the VSSSP all brought materials, processes and procedures from their local school to the VSSSP. These materials, processes and procedures were then synthesised into a new way of doing things that suited the VSSSP, but along the way teachers also added to their teacher toolbox with ideas from other schools. These ideas were shared back at the local school adding to the richness of resources and ideas for staff who were not part of the VSSSP.

VSSSP staff became better at critiquing their own work as they had developed these skills in order to teach successfully at a distance. This improvement appeared to assist low-literacy students in their mainstream classes as the VSSSP staff member was better able to differentiate work to an appropriate level. A huge area for transfer of knowledge and skills was in questioning technique, with VSSSP staff stating they were much better at asking open-ended questions that had many correct answers. VSSSP teachers also reported they had developed better feedback protocols and processes which allowed them to give specific feedback to students in order to support their further learning in future tasks.

In summary, both students and teachers at the VSSSP learned skills that they applied in their local classes in order to benefit themselves and others. These skills were in organisation, time management, working collaboratively and in a more open-

ended fashion. Explicit quality criteria strategies were also transferred or the skills in which to seek clarification if explicit quality criteria were absent.

### 6.3 Findings for Research Sub-Question 3

In what other ways, if any, did being involved with the VSSSP develop the student or staff member?

Some students reported feeling more engaged at school and looked forward to going to school when they were part of the VSSSP. This engagement was described as being due to an appropriate pace and level of challenge for work completed as part of the VSSSP. Most students felt they had an excellent rapport with their VSSSP teachers despite only seeing them in person four times per year for about 48 hours each time. This rapport appears to have been developed in sustained email communication where a student could ask deep questions that were commensurate with their cognitive ability without fear of taking up too much class time. Confidence and academic self-concept appear for the most part to have improved in both students and teachers who were part of the VSSSP. The reasons for this improvement were varied, from simple acceptance of who they were as a person, to more complex reasons such as a recognition that they were capable of very high level work when challenged appropriately and supported to achieve a difficult goal.

In a related area, parents in some rural, regional and remote towns referred to their choice to stay in that area for a few more years because they felt their child was receiving an appropriate education. For at least two families, these were parents who contributed to the social fabric of the small community through employment in the health and caring professions. This “staying put” in turn contributed to the economic fabric of the small community when a two-salary family, whose income would not be impacted by drought or other adverse weather events, chose to stay. The presence

of these VSSSP families, who had a choice to leave their small communities as their employment was transferrable to a number of areas, also added to the social fabric for people not associated with the VSSSP. This contribution included examples such as local sporting clubs who were always looking for enough members to field a team or local volunteer organisations who needed more people in order to carry out their work.

There were some negative impacts of the VSSSP reported. Some students found the expected autonomy of the VSSSP learning space at their local school the ideal place to demonstrate off-task behaviour through gaming on their computer. This behaviour was seen in only a few individuals, but is central to the tenet of the nature of the individual. The school environment had internet filters in place but the students in question found ways to work around them. Parents, students and teachers all spoke of the need for an individual to have intrinsic motivation in order to succeed in the virtual learning environment. Those students without a high capacity for self-regulation did not succeed in the virtual learning environment. It is important to separate poor choices made by some students in the VSSSP from the choices made by the vast majority of students who were able to conduct themselves in an appropriate manner. This allowed students to achieve learning success as measured by the intersection of their regard for their own skill development and academic success as described by results achieved in external standardised tests.

In summary, students and staff of the VSSSP developed in ways that were somewhat intangible such as increased school engagement and job satisfaction. An unexpected outcome was the contribution to the social and economic fabric of small communities who benefitted from families staying in the area when they felt their child was receiving an appropriate education. These families may otherwise have left

the community for a larger metropolitan centre. A contradictory development took place in a few individuals who chose to undertake off-task behaviour in the low supervision model of the VSSSP within the physical surrounds of the local school.

## 6.4 Findings for the Main Research Question

In what ways, if any, was the VSSSP valued in terms of meeting the educational and affective needs of gifted secondary school students in rural, regional and remote areas?

To answer this question, reference to the research model described in Figure 3.2 in Chapter 3, shown again at the beginning of Chapter 5, is required. The model of closely linked hexagonal cell shapes like a honeycomb, indicated that all the factors in the model may have an impact on the central cell which carried the label “The value of the provision”.

The VSSSP provided a place for gifted students to belong to a group of like-minded individuals despite geographical isolation. It also provided a similar experience for teachers of the VSSSP who found themselves in a virtual staff of extremely engaged teachers.

The VSSSP facilitated skill development in a number of areas and these skills were transferred back into the local school environment by both students and teachers. There was a beneficial effect for more people than were enrolled in the VSSSP, making good use of scarce government resources. The skill areas included effective time management, proficiency with technology, quality assurance skills and problem solving.

Creativity was supported, encouraged and was able to flourish in the VSSSP. This creativity included the development of new ways for working at a distance with students and collaborating at a distance for staff. Cross-KLA tasks allowed gifted students to demonstrate their ability to synthesise information and add another

element such as artistic or engineering flair to an open-ended task. The support and celebration of creativity was a very important part of the VSSSP school culture.

Quality teaching was supported and encouraged within the VSSSP by a detailed induction process that included gifted education training and technology training, then a school culture that valued all opinions and experiences. Often staff helped each other with skill development such as writing teaching programs and development of resources to support these programs. The skill-set mix of the staff allowed every person to add something to the learning of other staff.

The nature of the individual was critical to the success or otherwise of students or staff in the VSSSP. Students who did not succeed in the VSSSP environment had a very high academic self-concept but little resilience to not being able to do tasks quickly and/or place at the top of the class as they had in their local school. Others displayed off-task behaviour for much of the day and spent the time gaming on their computers despite it being expressly forbidden. The lack of ability to self-regulate in the low supervision model of the VSSSP meant some learners, regardless of their potential academic abilities, did not succeed in the environment. Students with a strong academic self-concept and who displayed resilience along with task commitment and self-regulation also reported feeling a strong sense of belonging that added to their engagement and enjoyment at school. These developments facilitated a positive academic self-concept and an approach of “personal best” achievement. Staff were, on the whole, organised individuals with an open mind to pedagogy and a willingness to innovate. They described themselves as hard-working, committed teachers who appreciated the opportunity to work with gifted students in a virtual learning environment whilst maintaining their roots and links to rural, regional and remote communities.

This case study has confirmed that for the majority of students, the VSSSP provided support for their affective and academic needs without the need for them to leave their home and family to attend boarding school. The VSSSP was successful in keeping the best and brightest in the bush by providing an appropriately challenging, fast-paced curriculum that was enriched by a deep sense of belonging in a group of like minds. This conclusion was supported by personal points of view from the range of participant groups as well as by achievement in standardised external tests such as ESSA and NAPLAN.

## **6.5 Significance of the Study**

The literature review revealed that no other virtual provision of this type has been investigated before. There has been considerable research into virtual programs that offer enrichment and/or extension for a few weeks or perhaps one semester, but no virtual provisions for gifted secondary school students where curriculum has been replaced in several of their core areas of study in an academically selective environment. There is no research about online provisions where some of the students had been in the virtual provision over a sustained period of years. That makes this case study unique globally and affords new knowledge in the area of education of gifted students in an increasingly digital world.

### **6.5.1 Construct Validity**

Construct validity can be demonstrated in a number of ways; for example, statistically through a factor or regression analysis, empirically through comparison of groups whom one might expect to offer differing points of view, or logically by adopting a measure that has been validated by another researcher (Cooksey & McDonald, 2010). In this research, the small sample size prevented any statistical tests of significance. However, the Rasch Analysis of Item Response Theory applied

to the survey instrument demonstrated construct validity of the instrument and construct validity of each theme once the whole survey had been separated into themes for investigation. This confirmation coupled with triangulation of results from a variety of participant groups in addition to results from external tests of achievement over a period of years, has provided evidence for measurement reliability.

The mixed-methods approach used in this research allowed the quantitative data from external tests of achievement to add veracity and support to the data collected through qualitative means. For example, students reported that they were doing well academically, their parents agreed, teachers reported that students were doing well academically and their Principal agreed. These qualitative data were then compared with data from external tests of achievement that provided an independent means to verify the statements of the participant groups. The quantitative data supported the notion that students were doing well academically as “quantitative data can generally help to support conclusions from the qualitative analyses” (Cooksey & McDonald, 2010, p. 201).

Statistical limitations of this research were mitigated by assessing a wide variety of points of view, to check for similarity of understanding and belief. Student and parent points of view aligned closely with each other as did teacher and Principal points of view. Importantly student and teacher points of view from students and staff directly involved with the VSSSP aligned closely. When the subjective points of view were compared to objective results from external standardised tests of achievement, the alignment of all points of view was confirmed and is further support for measurement reliability.



Measurement sensitivity has been considered by using a five-point Likert scale survey question response option in the survey instrument combined with open-ended questions where participants could expand on their Likert response. This arrangement allowed deep investigation of the Likert responses through analysis of the text supplied by participants.

Careful consideration and investigation of construct validity, measurement reliability and sensitivity demonstrate that the findings of this research have credibility.

## **6.6 Limitations of this Research**

The biggest limitation in this case study was the lack of capacity to conduct many meaningful statistical analyses due to the large difference in sample size of the study group and any comparison groups. This lack of statistical analysis means the data in the standardised external tests that were used as a possible measure of academic success in the VSSSP cannot be expressed with any level of statistical certainty, though the results are certainly suggestive of very positive comparisons. This lack was mitigated by presenting the results from successive cohorts of students who attended the VSSSP in successive years. The pattern of results showed commonality but there was no way to support these findings in a statistical manner.

Another limitation to statistical analysis is the absence of any data from a similar virtual selective secondary school provision anywhere in the world which could offer a comparison group. Over time it may be that other similar provisions will be implemented but at the moment this case study appears to stand alone in offering any data from a virtual selective secondary provision for rural, regional and remote gifted students for core areas of study (English, mathematics and science). Somewhat paradoxically, this limitation may also be a great strength as the

contribution of this research will add to our global understandings in relation to a particular cohort (rural, regional and remote gifted secondary school students). The new replacement version of the VSSSP, for example, is not restricted to the same rural, regional and remote areas, which further emphasises the uniqueness of this study, at least in Australia.

A limitation may also be that students who had chosen to exit the VSSSP soon after they started, to return to their mainstream classes in the local bricks-and-mortar school, were not interviewed first hand in this research. Had this research included surveying and interviewing students who had left the program, rather than relying on recounts of these events from staff members, greater insights into why the students left may have been revealed which would add further credibility to any findings.

A compressed time frame for data collection provided another statistical limitation. In the small window that was available to collect data before the VSSSP was closed to make way for the new gazetted virtual school, some decisions were limited. For example, fewer questions in the surveys offered to participant groups may have allowed factor analysis to be conducted to analyse survey responses. However with the imminent closure of the virtual provision, data had to be collected at the time they were available and the decision was made to collect as much data as possible. Whilst this is not a limitation in itself, the decisions made in a short time frame may have been different. The VSSSP in this research was closed by the NSW Department of Education at the end of the year the data for this research were collected (2014) and a new virtual selective secondary school was gazetted and opened in 2015. To reiterate the opening chapter, this case study in no way refers to the current gazetted virtual selective secondary school in NSW operated by the NSW

Department of Education; however, it is worth noting that the VSSSP in this case study was the five-year pilot for the current gazetted school.

## **6.7 Recommendations for Further Research**

There are a number of recommendations for further research possibilities. First, the number of questions in the survey instrument needs to be decreased in order to allow some factor analysis of the data collected. Doing so would potentially give further opportunities to look more closely at relationships and relate them to the findings of any future research in this setting. As well, removing any possible Hawthorne effect (Neuman, 2011) by enlisting the support of an independent researcher, rather than a member of the Senior Executive of the school at the time, may add further confidence to findings.

Direct questioning of students and staff at other virtual provisions for gifted students may offer credibility to the findings in this case study and may offer insight into whether or not this case study is representative. An increase in sample size through greater participation in a similar case study would also add to the credibility of findings. With a single school sample, findings need to be considered carefully before making any absolute statements about their meaning. That being said, the survey response rate of 50% of students and 67% of staff, and interviews with 82% of participating partner schools is well above many research response rates in education.

Future studies could collect much more data from parents about their reasons for deciding to send their child to the VSSSP. This information could allow greater insight into the other benefits that might accrue to the rural, regional or remote community as a result of having students stay in town for their education. It may also allow longitudinal studies into whether or not these students return to their small

communities after tertiary study, if they decide to go away for tertiary study at all, and it may allow a contrary point of view from the students to be uncovered.

There is considerable opportunity to look more closely at resilience of students, particularly gifted students who have been in a comprehensive school environment prior to joining an academically selective school environment, to better understand how resilience develops or why it may not develop in some gifted students. In particular, personally interviewing or surveying students who leave the VSSSP may provide some further insights into the reasons why they left.

It is highly recommended to conduct further investigation with graduates of the original VSSSP in this case study to investigate if there were any advantages or disadvantages they experienced once leaving the virtual provision. As some of the original VSSSP attendees are now at university, their reflections may provide valuable insight into the impact of keeping the best and brightest in the bush for their secondary school years.

## **6.8 Reporting to Stakeholders**

Participant groups in this research deserve to know the findings. Furthermore, the findings may be of interest to the NSW Department of Education for consideration in the newly gazetted virtual selective secondary school. As part of the State Education Research Applications Process (SERAP) approval, findings are required to be presented to the NSW Department of Education.

During the journey to write this thesis, several presentations at international conferences in gifted education have been made, to small audiences. The presentations at these international conferences were more about the day-to-day operation of the VSSSP than the research findings of this case study. As such, these findings are yet to be shared within the gifted education research community. A

paper presented at the 30<sup>th</sup> Annual conference of the Society for the Provision of Research in Rural Australia in 2015 (Bannister, Bannister-Tyrrell, Cornish & Gregory, 2015) also shared operational details of the VSSSP and some longitudinal data from external tests of achievement. Presentations at global gifted education conferences, or conferences that share research to support education in rural, regional and remote areas will allow dissemination of the completed findings to offer relevant insights to any countries considering a virtual provision for gifted students in rural, regional and remote areas.

## **6.9 Implications for Classroom Practice**

In any research the implications for practice are of prime importance. Classroom practice for gifted students in rural, regional and remote areas has been supported in this research by indicating that collaboration at a distance for both students and staff can be very successful provided the nature of the learner is considered. Successful learners in a virtual environment that groups gifted students together are those learners with intrinsic motivation and resilience to persist when challenged. These learners are also capable of working in an autonomous setting requiring little or no direction to remain on task. The same applies for staff who wish to work in the virtual selective school setting. They need to be collaborative by nature, organised and willing to be innovative and creative to solve problems. For both students and staff, willingness to take academic risks is an important feature of the individual.

Investment in technologies that allow collaboration, such as web-conferencing software and digital learning management systems, in addition to IT infrastructure and personal devices, afforded a valuable opportunity for gifted students in rural, regional and remote areas that could be replicated. In particular, the

strength of the collaborative approach to teaching indicates teacher professional growth that may benefit many more students than those in the VSSSP in this case study. The VSSSP also afforded career opportunities for people who could not move due to their connection to local farms or workplace.

The importance of teacher learning of gifted education strategies in order to understand the affective needs of gifted students appears to have been central to the development of rapport between teachers and students. Earlier extant research reported on the impact of negative teacher attitudes towards gifted students when teachers had not been given any training in the nature of gifted students and their unique educational needs. The induction process for new staff to the VSSSP gave equal attention to technology training and gifted education training signalling the relative importance of each skill-set in teachers at the VSSSP.

Grouping gifted students together, at least for part of each day, was strongly supported by this research. Grouping gifted students together allowed a fast paced, appropriately challenging curriculum to be undertaken in three core areas of study, which facilitated efficient time-management and organisational skills in students that they were then able to transfer to other areas of their life and schooling. It also afforded the development of skills of resilience when a challenge arrived, by encouraging problem solving before reaching out for assistance.

The most important part of disseminating these research findings is in how the findings might be used to assist other gifted students and their teachers in rural, regional and remote areas, if a virtual delivery method is being considered. The implications for classroom practice include the need to investigate the nature of the learner if a similar low-supervision model is to be employed. The need to implement resilience strategies and limit opportunities for off-task behaviour, if low self-

regulation is the nature or experience of the individual, cannot be stressed enough.

The students who succeeded in this model of virtual delivery had high self-regulation tendencies and high intrinsic motivation to achieve their personal best. Existing skills in using technology, differing levels of prior knowledge and differing previous results in external tests of achievement are meaningless if the individual student has little or low self-regulatory behaviours.

A further implication for classroom practice is the importance of reliable technology infrastructure when a virtual or other technology-driven environment is considered. The most common complaints and negative comments about the VSSSP in this case study related to the reliability and availability of the internet in order for learning and teaching to occur efficiently. The frustration experienced by students and staff when the infrastructure failed to provide an adequate service, interrupted learning and made for difficult conversations around assessment tasks or critical pieces of information to assist independent learning by students. Certainly those schools that were only able to offer a wireless connection for students to undertake web-conferencing had the most regular interruption to learning. Those schools who were able to offer an environment where student devices were connected via an ethernet cable for web-conferencing to occur had far fewer occasions of connections failing or service slowing down to an unusable level.

## **6.10 Implications for Classroom Practice in Other Settings**

The opportunities for this method of teaching and learning in other settings could be huge. For example, provided the internet connection is stable with a large enough data allowance, this method could be used in remote locations anywhere in the world assuming sustainable electricity production and internet connectivity can

be attained at the location. Perhaps it could be used in refugee camps (assuming of course safety, shelter, food and hygiene are adequate first) to ensure schooling can continue for some of the most vulnerable students. The method could be used to ensure indigenous languages are preserved through connection and dissemination from a few who may know the languages now, to more people in order for the language to be documented and retained. It could be used to support students with a long-term medical condition which prevents them from attending school regularly. It could also be used to support students anywhere in the world who experience isolation from a bricks-and-mortar school due to weather extremes. It could be used to support teachers who are isolated as well which may then retain them in the profession and facilitate professional development through contact with others.

## **6.11 Implications for System and Operational Policy**

As stated in the literature review, Section 2.1.5, there is no current Australia-wide policy to support the education of gifted and talented students. States and territories use a range of research to underpin the policy documentation they currently use to support these students, and much of this research has been superseded for some years now. As well, there is currently no policy in any state or territory to support and guide the education of students in rural, regional and remote areas as an identified group with the special circumstance of distance that affects the services and opportunities they receive. Furthermore, there is no current state or federal government policy to address the variability of internet connectivity experienced by all people living in rural, regional and remote areas, not just those at school. This original research provides information and evidence on the lived experience for a group of gifted secondary school students in rural, regional and



remote areas of NSW along with their teachers, where both students and staff attend or work at their local government secondary school. As such, it could be beneficial as a starting point for governments, both state and federal, to build policy that supports government attention to system-wide and operational-level policy for resourcing that will facilitate equity of access to connectivity, connectivity speeds and data allowance to allow the full contribution of these students and their teachers to the broader fabric of their locations and beyond. A second, coherent, system-wide and operational-level policy on the education of gifted students, which is based on current research including the findings of this study, is also urgently needed in order to allow these students and their teachers to flourish.

In summary, keeping the best and brightest students and teachers in the bush is essential to mitigating the loss of young people and families from rural communities, where they are free to leave if they wish. This outcome can be achieved by creating a sustained positive social fabric at the local bricks-and-mortar school and in the wider community, preventing the desolation and destruction of rural, regional and remote communities. Keeping the best and brightest students and teachers in the bush is essential to ensuring dynamic and vibrant rural, regional and remote communities.

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## **Appendices**

Appendix A Gagné Differentiating Model of Giftedness and Talent 2.0

Appendix B Approvals to Conduct the Research

Appendix C Forms Sent to Research Participants

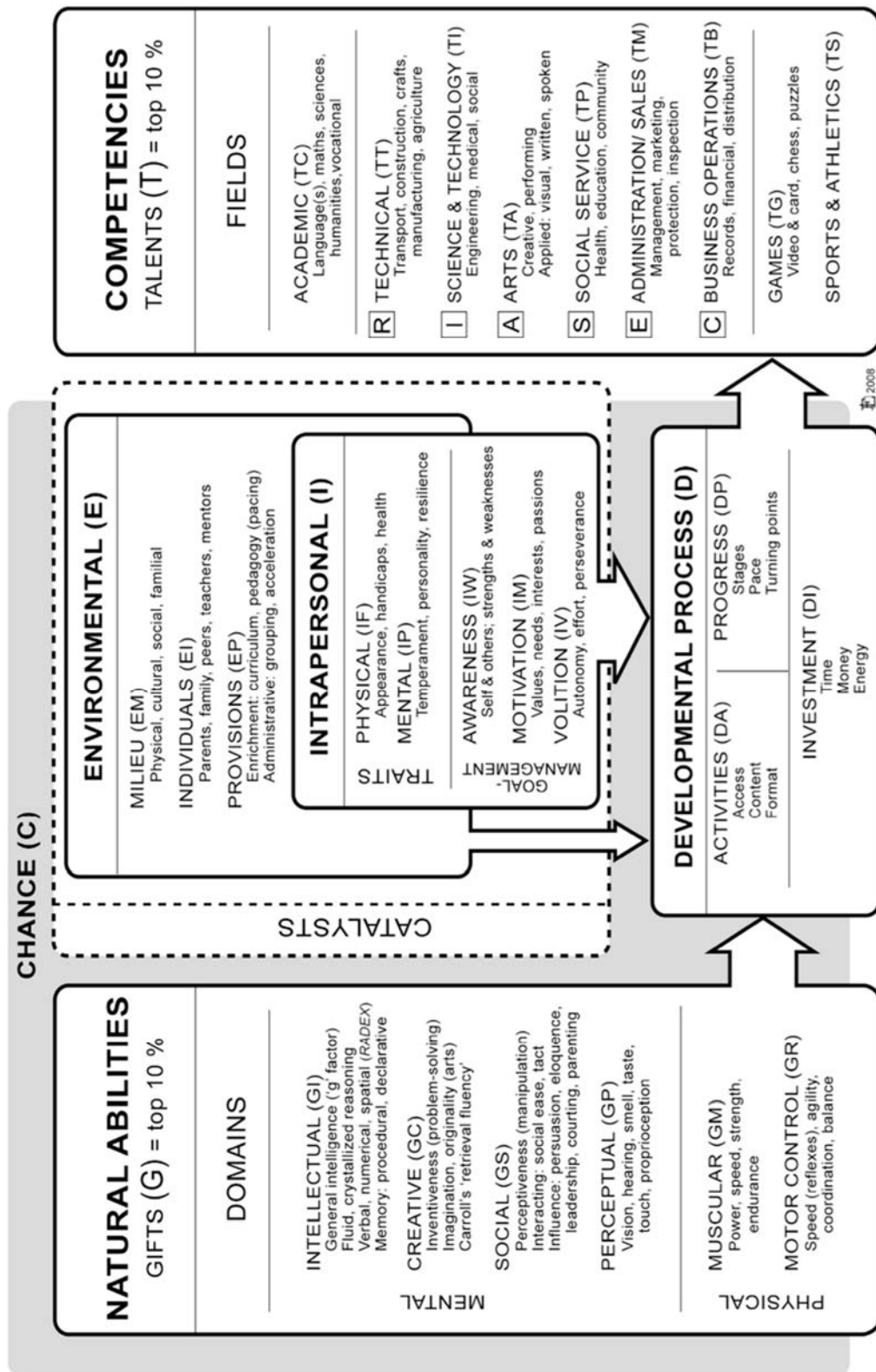
Appendix D Survey Instruments

Appendix E Interview Questions

Appendix F SMART Data Interpretation

Appendix G Results from Rasch Analysis

## Appendix A Gagné Differentiating Model of Giftedness and Talent 2.0 (Gagné, 2008)





## **Appendix B Approvals to Conduct the Research**

Approval letters to conduct the research follow on the next two pages.

# INFORMATION SHEET

## for

# PARTICIPANTS

I wish to invite you to participate in my research project, described below.

My name is Barbara Bannister and I am conducting this research as part of my Ed. D. in the School of Education at the University of New England. My supervisors are Dr Linley Cornish, Dr Sue Gregory and Dr Michelle Bannister-Tyrrell.

Research Project	"Virtual provision for talented rural and remote secondary students: Keeping the best and brightest in the bush."
Aim of the research	The research aims to explore the perceptions of students, staff, partner school Principals and parents who are part of the virtual high school provision.
Survey	I would like to invite all participants to take part in an online survey.
Interview	I would also like to conduct a face-to-face interview with a sample of students, staff and parents of the virtual high school provision at your local high school in addition to a sample of local school principals. The interview will take approximately 45 minutes to 1 hour. With your permission, I will make an audio recording of the interview to ensure that I accurately recall the information provided. Following the interview, a transcript will be provided to the participant for checking. They may add anything they may have forgotten to say in the interview.
Confidentiality	Any information or personal details gathered in the course of the study will remain confidential. No individual will be identified by name in any publication of the results. All names will be replaced by pseudonyms; this will ensure that you are not identifiable.
Participation is Voluntary	Please understand that your involvement in this study is voluntary and I respect your right to withdraw from the study at any time. You may discontinue the interview at any time without consequence and you do not need to provide any explanation if you decide not to participate or withdraw at any time.
Questions	The interview questions will not be of a sensitive nature: rather they are general, aiming to enable you to enhance my knowledge of the challenges and opportunities for talented students in rural and remote areas of NSW.

Use of information	I will use information from the interview as part of my doctoral thesis, which I expect to complete in December 2014. Information from the interview may also be used in journal articles and conference presentations before and after this date. At all times, I will safeguard your identity by presenting the information in way that will not allow you to be identified.
Upsetting issues	It is unlikely that this research will raise any personal or upsetting issues but if it does you may wish to contact your local Community Health Centre.
Storage of information	I will keep hardcopy recordings and notes of the interview in a locked cabinet at my home office. Any electronic data will be kept on a password protected computer in the same place. Only the research team will have access to the data.
Disposal of information	All the data collected in this research will be kept for a minimum of five years after successful submission of my thesis, after which it will be disposed of by deleting relevant computer files, and destroying or shredding hardcopy materials.
Approval	This project has been approved by the Human Research Ethics Committee of the University of New England (Approval No. HE13-257, Valid to 09/12/2014). The project has also been approved by SERAP (Approval No.2013210, Valid to 09/12/2014). A copy of the approval letters is attached.
Contact details	<p>Feel free to contact me with any questions about this research by email at <a href="mailto:bbannis2@une.edu.au">bbannis2@une.edu.au</a> or by phone on 0467 229 020.</p> <p>You may also contact my supervisors. My Principal supervisors name is Dr Linley Cornish and she can be contacted at <a href="mailto:lcornis2@une.edu.au">lcornis2@une.edu.au</a> or 02 6773 3458 and my Co-supervisors names are Dr Sue Gregory who can be contacted on <a href="mailto:sgregor4@une.edu.au">sgregor4@une.edu.au</a> , 6773 5054 and Dr Michelle Bannister-Tyrrell who can be at <a href="mailto:mbannist@une.edu.au">mbannist@une.edu.au</a> or 02 6773 3840 .</p>
Complaints	<p>Should you have any complaints concerning the manner in which this research is conducted, please contact the Research Ethics Officer at:</p> <p>Research Services University of New England Armidale, NSW 2351 Tel: (02) 6773 3449 Fax: (02) 6773 3543 Email: <a href="mailto:ethics@une.edu.au">ethics@une.edu.au</a></p>



**School of Education**  
**University of New England**  
Armidale NSW 2351  
Australia  
**Phone** 02 6773 3333

**INFORMATION SHEET**  
**for**  
**PARTICIPANTS**

Thank you for considering this request and I look forward to further contact with you.

regards,

Barbara Bannister

## INFORMATION SHEET FOR CHILDREN AND YOUNG PEOPLE (aged 12-16)

*“Virtual provision for talented rural and remote secondary students: Keeping the best and brightest in the bush.”*

Dear Students,

We wish to invite you to participate in my research on the above topic. Dr Linley Cornish, Dr Sue Gregory and Dr Michelle Bannister-Tyrrell are my supervisors at university. They teach pre-service teachers at the University of New England. We are currently doing a research study that is trying to find out more about the perceptions of students, staff and parents who take part in the virtual high school provision.

We are hoping that young people, who are part of the virtual provision, will help us by taking part in this study.

This Information Sheet has the answers to many of the questions that you and your parent(s) may have about the study.

### **1) What is the study for and why is it being done?**

We hope that by doing this study, we will learn more about what students, parents and staff think about the virtual provision. There is a lot of research about gifted and talented education and a little bit about online or virtual education, but not very much about the combination of talented students and online education. This information will help us understand what people really think about the virtual provision. This will be one of the first studies in Australia and the world to do this for talented rural and remote students.

### **2) What would I be asked to do if I took part in the study?**

We want you to take part in a couple of surveys where you answer questions about your experience in the virtual provision. We would then like to interview a sample of students, staff and parents to delve a little deeper into what their perceptions are.

What will be different is that we want to record your voice as you answer the questions, if your name appears in our interview sample list. Recording your answers is very important for this study, as it will help us listen carefully to what you say at the time and not lose track of what you are saying when we write notes.

These audio recordings will NOT be heard by anyone except Mrs Bannister. They will only be kept for a short time to allow us to gather all the information we need and then will be destroyed. Until they are destroyed they will be kept in a locked program on a private computer. This is something we will be very careful about, as we must follow special rules set down by the university to protect you.

### **3) Interview**

A sample of students, parents and staff will be interviewed. It is impossible to interview everyone so we take a sample. We need everyone to either agree or disagree to an interview so we can prepare a sample from as wide a range of people as possible. This interview will also be recorded so we don't miss any important information you have.

It will be very relaxed and informal and you don't have to talk about anything that you don't want to.

### **4) Will my parents have to do anything?**

Apart from making sure you are happy to participate in this research project, your parents will be asked to complete a questionnaire of their perceptions and to take part in an interview if their name appears in the sample for interviews, should they agree to take part. Their interviews will also be recorded but NOT their names.

### **5) When and where would the surveys and interview take place?**

Interviews will be either anonymous online interviews or anonymous paper interviews. The interviews will take place during term time later this term or throughout Term 1 2014.

### **6) What information will the researchers want me to tell them?**

We want you to tell us all about your thoughts and feelings about the virtual high school provision. We want you to tell us about things that YOU think are important. We want you to tell us what you think other people should know about a virtual high school provision for talented high school students in rural and remote locations.

### **7) Why do you need to record what I tell you?**

We record these sessions because when we listen and try to write what you say, we may miss recording some important points. By listening only and making just a couple of notes, we can get a better sense of your perceptions. Once the transcript has been done it will be sent back to you for checking. You can add information that you have thought about since doing the interview, and then return it Mrs Bannister.

## **8) What will be done with this information that I give?**

First, Mrs Bannister will take the recordings to her home office and will type out every word that is on the recording so that we know we haven't missed anything. This is called the 'transcript'.

When this is being done, Mrs Bannister makes sure that no-one's real names are used in the 'transcript' of the interview that is printed out. This makes sure that nobody reading it can tell who has said what, and so what you say stays confidential.

Then, the researchers read through these typed-out 'transcripts' very carefully, making notes and trying to pick out all of the most interesting and important things that the participants have been telling us. We are looking for things that will help us and other people understand more about the perceptions of students, staff and parents who are part of the virtual high school provision.

The researchers will write a report at the end of the study so that we can share the information from this study with other researchers and teachers who are interested and involved in children and young people's education.

We also try to write articles about the study and publish these and also talk about the study at meetings and conferences so that what we have found out actually gets to people who might be able to use the information to help others. If we didn't do this, then the children and young people who helped us might feel that they had done this for nothing.

Remember again though, that in any of the articles or reports, your name will not appear as what you tell us is confidential and private. What we would do is perhaps say that "A Year 7 student thought that"...." or write that "John (not his real name), thinks that....."

## **9) Who will be told about any information that I give?**

Each of the surveys and the interview are strictly confidential. What you tell us will stay within the research team, apart from when we report the study as we explained above in point (8). None of what you tell us will become part of any school records or notes. All information remains confidential.

## **10) Do I have to take part in this study?**

Not at all. You should only take part if you want to and are happy to be recorded as you do it.

## **11) What will happen if I don't want to take part?**

Nothing at all. You have every right to say that you would rather not take part.

## **12) Can I change my mind if I decide to participate?**

Yes. You can choose to leave the study at any time and nothing at all will be said, apart from 'Thank you very much for thinking about taking part'. You can also choose to discuss or not discuss any aspect of your experience - whatever you feel most comfortable with.

## **13) Will the study benefit me in any way?**

We can't promise that you will get any benefit from taking part. However, you might feel that by describing your perceptions of the virtual high school provision you may help other teachers, talented students and their parents to understand what happens in your virtual school provision.

## **14) Have you got permission to do this study?**

Yes. We have permission from the Ethics Committee at the Human Research Ethics Committee of the University of New England. They have looked carefully at this study and have 'passed' it.

## **15) What if I have other questions about the study?**

Please contact the Principal Researcher, Mrs Barbara Bannister at any time. Her mobile phone number is 0429 368 402 and her email is [bbannis2@une.edu.au](mailto:bbannis2@une.edu.au). You can also call Dr Linley Cornish at the University of New England on 02 6773 3458

If you have any complaints about the way this research is conducted, please contact the Research Ethics Officer at the following address:

Research Services  
University of New England  
Armidale, NSW 2351.  
Telephone: (02) 6773 3449 Facsimile (02) 6773 3543  
Email: [ethics@une.edu.au](mailto:ethics@une.edu.au)

## **16) What if I feel that I would like to talk to someone after the interview about any thoughts, feelings or problems that I have?**

You may contact any member of the research team, or you may prefer to speak with your xsel Support Person or parents.



## **17) The formal 'stuff':**

This project has been approved by the Human Research Ethics Committee of the University of New England (Approval No. HE??/???, valid to ??/??/????).

Please keep this information sheet as you might want to discuss it with friends, family or relatives.

Thanks a lot for taking the time to read this and for any help that you are able to give us with this study.

***Barbara Bannister, Linley Cornish, Sue Gregory,  
Michelle Bannister-Tyrrell***

## **ASSENT FORM for STUDENTS**

**“Virtual provision for talented rural and remote secondary students: Keeping the best and brightest in the bush.”**

*Please write your name after ‘I,’ and circle the yes/no answer you want.*

I, ....., have read the Information Sheet for Students and any questions I asked have been answered and I understand them. Yes/No

I agree to take part in this work Yes/No

I know that I can change my mind at any time. Yes/No

I agree that anything we talk about will be written about using an invented name. Yes/No

I agree that the interview can be recorded and transcribed. Yes/No

.....  
Student

.....  
Date

.....  
Researcher

.....  
Date

## CONSENT FORM for PARTICIPANTS

*Research Project: "Virtual provision for talented rural and remote secondary students: Keeping the best and brightest in the bush."*

- 
- I, ....., have read the information contained in the Information Sheet for Participants and any questions I have asked have been answered to my satisfaction. Yes/No
- I agree to participate in this activity, realising that I may withdraw at any time. Yes/No
- I agree that research data gathered for the study may be published using a pseudonym Yes/No
- I agree that I may be quoted using a pseudonym Yes/No
- I agree to the interview having my audio recorded and transcribed. Yes/No
- I would like to receive a copy of the transcription of the interview. Yes/No
- I am older than 18 years of age. Yes/No

.....  
Participant Date

.....  
Researcher Date

## **Appendix C Survey Instruments**

Survey instruments follow on the next three pages

## **Student Survey - blank copy**

Q1 This survey is designed to capture your opinion about a range of matters regarding the virtual selective high school provision. There are no right and wrong answers - it is your opinion that matters. The last question is a free text question where you can add anything else you would like to say. There is no limit to the topics you can cover here. Again it is your opinion that counts. If you do not wish to answer a question simply leave it blank, however please try to answer as many questions as you can. Where it says I, me, mine, or my, it refers to you. This survey should take you around 20 minutes to complete. Thank you for taking the time to complete this survey.

Q2 What Year are you currently enrolled in at school?

- ☐ Year 7
- ☐ Year 8
- ☐ Year 9
- ☐ Year 10
- ☐ Year 11

Q3 What year did you become involved with xsel?

- ☐ 2010
- ☐ 2011
- ☐ 2012
- ☐ 2013
- ☐ 2014

Q4 Approximately how many high school students does your base school have?

- ☐ Fewer than 500 high school students
- ☐ About 500 high school students
- ☐ More than 500 high school students

Q5 Do you identify as being of Aboriginal or Torres Strait Islander descent?

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

Q6 I enjoy being part of xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q7 My skill level with respect to technology in general, prior to commencing xsel was excellent.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q8 My skill level with respect to technology in general now is excellent.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q9 xsel has helped develop my digital presentation skills significantly.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q10 My ability to manage unexpected events before I joined xsel was excellent.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q11 My ability to manage unexpected events now is excellent.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q12 Other students in xsel are far more talented than me.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q13 The weekly work in xsel is challenging.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q14 The assessment tasks in xsel are challenging

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q15 In general I find the pace of work in my xsel classes to be the right pace for me.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q16 Being in xsel supports my creative side.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q17 I always know what is expected of me in an xsel assessment task

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q18 Not being able to see the teacher physically during lessons is a limitation.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q19 My xsel teachers make me feel welcome in every lesson

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q20 With regard to your academic abilities how do you regard yourself?

- ☐ One of the Worst
- ☐ Below Average
- ☐ About average
- ☐ Above Average
- ☐ One of the Best

Q21 Please outline any way(s) that xsel may have helped you take some risks with regard to your learning

Q22 The virtual classroom environment suits me better than a regular classroom environment.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q23 I feel isolated in xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q24 The assessment tasks in xsel are hard to understand

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q25 It takes far too long to find my work on Moodle.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree



Q26 I have found friends readily in xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q27 I communicate with xsel students from other schools regularly outside my virtual class lesson times.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q28 I enjoy being able to meet other talented students.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q29 I really do not like the virtual classroom environment.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q30 My xsel teachers are hard to communicate with.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q31 xsel Moodle is well organised.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q32 Please outline any way(s) that being in xsel may have helped you complete assessment tasks in your mainstream classes.

Q33 Before I started in xsel my time management skills were effective.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q34 Since I have been in xsel my time management skills have improved

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q35 I feel that I belong in xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q36 I am a very organised person.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q37 I take part in many extra-curricular activities such as music, sport or debating.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q38 xsel is a very flexible school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q39 Residential school is an essential and integral part of the virtual school environment.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q40 The lessons at residential school are always boring.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q41 Please outline any way(s) that xsel may have helped you be a better learner

Q42 My teachers in xsel know me well as a person.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q43 I feel comfortable talking to my xsel teachers about anything.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q44 I am or have been bullied or harassed by people in xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q45 Please outline any way(s) that xsel may have made you a better student in your local school classes

Q46 I am or have been bullied or harassed by people at my local school for being an xsel student.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q47 Other xsel students are not like me.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q48 My xsel teachers really know their subject material.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q49 It is hard to do anything differently in xsel, things are always very rigid.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q50 I never get to say anything in a virtual lesson because the teacher ignores me.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q51 I would describe myself as a motivated student.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q52 I work well without close supervision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q53 The necessary timetable changes in xsel interrupt my learning.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q54 Virtual lessons (synopps) should go for a longer time.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q55 My teachers are always well prepared for virtual lessons.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q56 Residential school is not necessary.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q57 If I was not in xsel I would not attend my local high school.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q58 It is important to have a balance between physical activity, school work and family time.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q59 Technology skills will be useful in the future workplace.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q60 I would recommend xsel to other talented students.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q61 Please outline any way(s) that xsel may have made you more engaged at school

Q62 I have many ideas about new and different ways to do things

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q63 I can express my ideas for new and different ways to do things in xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q64 Is there anything else you would like to add?

## Parent Survey – blank copy

Q1 The following survey questions/statements are aimed at gathering your opinion about a range of matters regarding the virtual selective high school provision. There are no right or wrong answers - your opinion is what matters. The last question is a free text question to write anything else you would like to. There is no limit to what topics you can cover here - again it is your opinion that matters. If you do not wish to answer a question simply leave it blank, however please answer as many questions as you can. Only demographic questions (such as what Year your child is in) are compulsory. This survey should take you around 20-25 mins to complete. Thank you for taking the time to complete this survey.

Q2 My child is currently enrolled in

- ☐ Year 7
- ☐ Year 8
- ☐ Year 9
- ☐ Year 10
- ☐ Year 11

Q3 My child has been with the virtual provision since

- ☐ 2010
- ☐ 2011
- ☐ 2012
- ☐ 2013
- ☐ 2014

Q4 The local high school attended by my child has enrolments of approximately

- ☐ fewer than 500 high school students
- ☐ 500 high school students
- ☐ more than 500 high school students

Q5 My child identifies as being of Aboriginal or Torres Strait Islander descent

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

Q6 My child's first language is English

- ☐ Yes
- ☐ No

Q7 My child has a special need in addition to his or her giftedness.

- ☐ Yes
- ☐ No

Q8 My child enjoys being part of the virtual provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q9 I would describe my child as an organised person.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q10 I am happy for my child to be part of the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q11 Before entering the virtual selective high school provision, my child managed unexpected events easily.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q12 After being in the virtual selective high school provision for a while, my child's ability to manage unexpected events improved

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q13 There is a need for a dedicated provision for talented students in rural, regional and remote areas.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree



Q14 My child works well without close supervision.

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Most of the Time
- ☐ Always

Q15 Before entering the virtual selective high school provision, my child's time management skills were effective

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q16 Before entering the virtual selective high school provision, my child's skills with technology in general were effective

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q17 Since joining the virtual selective high school provision, my child's technology skills in general have improved

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q18 Since joining the virtual selective high school provision, my child's time management skills have improved

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q19 My child enjoys their virtual classes.

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Most of the Time
- ☐ Always

Q20 My child enjoys attending residential school.

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Most of the Time
- ☐ Always

Q21 I find the teachers in the virtual provision approachable.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q22 I contact my child's virtual provision teachers at any time by email.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q23 I feel informed about what happens in the virtual selective high school provision on a daily basis.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q24 My child enjoys the school work in the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q25 My child has found friends readily in the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q26 My child has been or is being bullied or harassed by people in the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q27 My child has been or is being bullied or harassed by people at the local school for being involved with the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q28 Residential school is an essential and integral part of the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q29 There is a high level of challenge in the weekly work my child completes for the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q30 I sit with my child to look at the virtual selective high school provision Moodle to discuss what school work they are doing.

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Most of the Time
- ☐ Always

Q31 Our family enjoys using technology in general.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q32 There is too much homework in the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q33 The school work in the virtual selective high school provision is often too difficult for my child.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q34 Please outline any positive comments your child has made to you about their experiences in the virtual selective high school provision.

Q35 It is important to have a balance between physical activity, school work and family time.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q36 My child has a strong and positive sense of why s/he is in the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q37 As a family we better understand our talented child/ren after being part of the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q38 Residential school is not necessary.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q39 Teachers in the virtual selective high school provision genuinely know my child.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q40 My child's learning needs are met well in the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q41 I have always known my child was talented.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q42 I regularly make contact with other parents in the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q43 Please outline any negative comments your child has made to you about their experiences in the virtual selective high school provision.

Q44 I read the virtual selective high school provision newsletter.

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Most of the Time
- ☐ Always

Q45 I understand how the virtual lesson space works.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q46 I have seen my child complete some challenging assessment tasks for the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q47 The virtual selective high school provision offers my child unique learning opportunities.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q48 If you answered Agree or Strongly Agree to the question above, please expand on your answer to outline what learning opportunities you consider unique.

Q49 The virtual selective high school provision teachers know their subject area well.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q50 The synchronous virtual lesson (synopps) length is too short.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q51 My child often seems confused about what work s/he is meant to be doing in the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q52 The necessary timetable changes in the virtual selective high school provision impact on my child's learning considerably.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q53 I have found parents with similar interests and approaches to parenting their talented child, since my child joined the virtual selective high school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q54 Technology skills will be useful in the future workplace.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q55 Please outline any comments or advice you would offer to other parents considering the virtual selective high school provision for their child.

Q56 I would describe my child as being a naturally motivated student.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q57 The virtual selective high school provision is very flexible.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q58 Is there anything you would like to add?



## Teacher Survey - blank copy

Q1 The following questions/statements are designed to capture your opinion about a range of matters regarding the virtual selective high school provision. There are no right or wrong answers - your opinion is what matters. Questions or statements that have me, my, I or mine refer to you. If you do not wish to answer a question simply leave it blank, however please answer as many questions as you can. Only the demographic questions at the start are compulsory. The last question is a free text question where you can add anything you would like to. This survey should take you approximately 20 - 30 minutes to complete. Thank you for taking the time to complete this survey,

Q2 How long have you been teaching?

- ☐ 1-5 Years
- ☐ 6-10 Years
- ☐ More than 10 Years

Q3 When did you first teach in xsel?

- ☐ 2010
- ☐ 2011
- ☐ 2012
- ☐ 2013
- ☐ 2014

Q4 In which KLA do you work in xsel ?

- ☐ English
- ☐ Mathematics
- ☐ Science

Q5 The base school from which you teach has enrolments of

- ☐ fewer than 500 high school students
- ☐ around 500 high school students
- ☐ more than 500 high school students

Q6 Please indicate your tertiary education level.

- ☐ Bachelor's degree
- ☐ Bachelor's degree with honours
- ☐ Master's degree or higher

Q7 I enjoy being part of xsel

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q8 My skill level with respect to technology in general, prior to commencing with xsel was excellent.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q9 My skill level with respect to technology in general after teaching in xsel has improved.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q10 xsel has helped develop my digital presentation skills significantly.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q11 My ability to manage unexpected teaching/ learning related issues before I joined xsel was excellent.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q12 Please outline any way(s) that xsel may have helped you to use a wider range of teaching strategies for gifted students.

Q13 My ability to manage unexpected teaching & learning issues after working in xsel is excellent.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q14 I prepare a variety of challenging weekly work for my xsel classes.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q15 I prepare a variety of challenging assessment tasks for my xsel students.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q16 Please outline any way(s) in which xsel may have enhanced your capacity to teach your subject.

Q17 I generate a clear marking guideline for xsel assessment tasks.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q18 Please outline any way(s) that working in xsel may have enhanced your ability to write assessment tasks.

Q19 Please outline any way(s) that working in xsel may have helped to extend your teaching experience.

Q20 My students submit most of their weekly work in xsel on time.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q21 It is hard to do anything differently in xsel, things are always very rigid.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q22 My students make me feel welcome in every lesson

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q23 Before I started teaching in xsel, the breadth of my skill set as a classroom practitioner was limited

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q24 My ability to teach talented students is about average.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q25 I prefer teaching in the virtual classroom to the bricks and mortar classroom.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q26 I feel professionally isolated in xsel

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q27 I have found professional friends readily in xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q28 I collaborate with people from other schools regularly, outside my virtual lesson times.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q29 Please outline any way(s) that teaching in xsel may have extended your content knowledge of your subject.

Q30 I enjoy being able to meet like-minded teachers.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q31 My fellow xsel teachers are hard to communicate with.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q32 My time management skills before I started teaching with xsel were effective.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q33 Teaching in xsel has helped me improve my time management skills.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q34 xsel staff interactions are focused on teaching and learning

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Often
- ☐ All of the Time

Q35 After teaching in xsel, the breadth of my skill set as a classroom practitioner has increased.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q36 I am a very organised person.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q37 xsel is a very flexible school provision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q38 Residential school is an essential and integral part of xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q39 My fellow teachers in xsel know me well as a professional.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q40 I enjoy the professional collaboration with other staff in xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q41 I have been or am being bullied or harassed by people in xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q42 I have been or am being bullied or harassed by people at my local school for being an xsel teacher.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q43 Virtual lessons are difficult to deliver well.

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Often
- ☐ All of the Time

Q44 If you answered "sometimes, often or all of the time" above, please choose the most common reason(s) for lesson delivery difficulties.

- ☐ Technology issues out of control of the individual (e.g. network problems)
- ☐ Timetable issues
- ☐ Operator error - teacher
- ☐ Operator error - student
- ☐ Lesson length too short
- ☐ Lesson length too long
- ☐ Subject material not suitable to the virtual classroom
- ☐ Other

Q45 I would describe myself as a motivated person.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q46 Residential school is not necessary.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q47 Please outline any way(s) that teaching in xsel may have enabled you to better engage your students

Q48 I work well without close supervision.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q49 The necessary timetable changes impact considerably on teaching and learning in xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q50 Please outline any impact teaching in xsel may have had on your ability to teach junior or senior courses at your base school

Q51 Virtual lessons (synopps) should go for a longer time.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q52 Communication across the whole of xsel is adequate.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree



Q53 My students are always well prepared for virtual lessons.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q54 I have grown considerably as a professional during my time with xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q55 My fellow xsel teachers share the workload evenly with me.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q56 I transfer teaching materials from my virtual classroom to my local school classroom.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q57 I share teaching materials from xsel with my local school colleagues.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q58 Being an xsel teacher has helped me be a better local school teacher.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q59 Not being able to see the students physically during lessons is a limitation to teaching & learning.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q60 My syllabus knowledge after working in xsel has improved

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q61 xsel staff work as a team to develop the teaching and learning materials

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q62 Working in xsel has helped me make the link between theory and practice for teaching gifted/talented students.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q63 Please outline any way(s) xsel may have helped you develop more effective teaching programs for gifted students.

Q64 It is important to have a balance between physical activity, school work and family time.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q65 Technology skills will be useful in the future workplace.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q66 I have innovative/creative ideas for teaching & learning.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q67 I feel able to express innovative/creative ideas I have for teaching & learning in xsel.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q68 xsel provides the opportunity to implement innovative/creative ideas I have for teaching & learning

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

Q69 Is there anything you would like to add?

## **Appendix D Interview Questions**

Interview questions follow on the next three pages

## **Interview Questions**

**Virtual provision for talented students in rural and remote secondary students: Keeping the best and brightest in the bush.**

### **Students**

#### **Demographic data**

- I am in Year 7/8/9/10
- I am Male/Female
- I have been in xsel for 1/2/3/4 years.
- My local high school has less than 500 students/about 500 students/more than 500 students

#### **Interview questions**

1. Tell us a little about yourself and how you came to be part of xsel.
2. Have you ever taken an online course before you started in xsel?
3. What were some of your initial thoughts/expectations about what it would be like?
4. Were there any “surprises” when you first began in xsel or did it pretty much fit with what you expected?
5. How is an xsel class different to a regular class in school?
6. What do you like most about online learning?
7. Are there things about online learning that are more challenging than in a regular classroom?
8. What are you proudest of with respect to your work in xsel?
9. What happens at residential school?
10. Do you think you have grown as a learner through xsel or through online learning in general, and if so, how?
11. Is there anything that one of your xsel teachers has done that has particularly inspired you? And/or, is there something that you think they *could* do that would really inspire you to do your best as a learner?
12. What do you think are the most important attributes of an xsel teacher?
13. Do you enjoy communicating with other students in xsel?
14. Any final thoughts/impressions about online learning or xsel in general?

## Teachers

### Demographic data

- I teach English/Mathematics/Science
- I have been in xsel for 1/2/3/4 years.
- My local high school has less than 500 students/about 500 students/more than 500 students

### Interview questions

1. Tell us a little about yourself and how you came to begin teaching in xsel.
2. Briefly describe some initial thoughts about your experiences teaching online.
3. Were there any “surprises” (pleasant or otherwise) when you first began teaching online?
4. What are the pros/cons of teaching or learning online versus in a regular classroom?
5. Do you think the online environment is a good match for gifted learners? Please explain.
6. How do you structure your course and why? Do you structure it differently online than you would in a bricks and mortar classroom?
7. How do you communicate with your students? What do you find most effective in this regard? How would you characterize these communications?
8. Do you encourage interaction and/or collaboration among the students? If so, how? Do you think student - student interaction is important?
9. How has online learning changed in xsel over the last few years? (*for those that have been with xsel for 2 or more years only*)
10. What are the benefits and challenges of the various technologies xsel uses (for you and/or for your students)?
11. What technologies are most effective for given purposes and why?
12. What are you proudest of in your courses or as an online teacher in general? Do you have any success stories to share? Challenging moments?
13. Can you tell me about the development of your subject knowledge and professional learning since you joined xsel?
14. Do you have any ideas for improving the online learning experience or directions you would like to see it go in?
15. Any final thoughts/impressions?

## **Parents**

### **Demographic data**

- I have a child in Year 7/8/9/10
- They have been in xsel for 1/2/3/4 years.
- My local high school has less than 500 students/about 500 students/more than 500 students

### **Interview questions**

1. Tell us a little about yourself and how your child came to be in xsel.
2. Briefly describe some initial thoughts about your experiences in xsel.
3. Were there any “surprises” (pleasant or otherwise) when your child first began in xsel?
4. What do you see as the pros/cons of learning online versus in a regular classroom?
5. Do you think the online environment is a good match for gifted learners? Please explain.
6. How do you communicate with your child’s teachers? What do you find most effective in this regard? How would you characterize these communications?
7. Do you think student - student interaction between talented students is important?
8. What are the benefits and challenges of xsel for your child?
9. What are you proudest of in your child’s progress in xsel? Do you have any success stories to share? Challenging moments?
10. Do you have any ideas for improving the online learning experience or directions you would like to see xsel go in?
11. Any final thoughts/impressions?

## **Partner school Principals**

### **Demographic data**

- My school has xsel students in Year 7/8/9/10
- We have a total of ?? xsel students at this school
- My school has ?? xsel teachers
- These xsel staff teach English/ Mathematics/Science in xsel and ?? here at this school.
- This school has less than 500 students/about 500 students/more than 500 students

### **Interview questions**

1. Tell us a little about your school and how it came to be involved in xsel.
2. Briefly describe some initial thoughts about your school experiences in xsel.
3. Were there any “surprises” (pleasant or otherwise) when your connection first began with xsel?
4. What do you see as the pros/cons of learning online versus in a regular classroom?
5. Do you think the online environment is a good match for gifted learners? Please explain.
6. How do you communicate with xsel about the staff and/or students that you share? What do you find most effective in this regard? How would you characterize these communications?
7. Do you think student - student interaction between talented students is important?
8. What are the benefits and challenges of xsel for your school?
9. What are you proudest of in your school’s connection with xsel? Do you have any success stories to share? Challenging moments?
10. Do you have any ideas for improving the online learning experience or directions you would like to see xsel go in?
11. Any final thoughts/impressions?

## **Appendix E SMART Data Interpretation**

SMART data interpretation follows on the next page



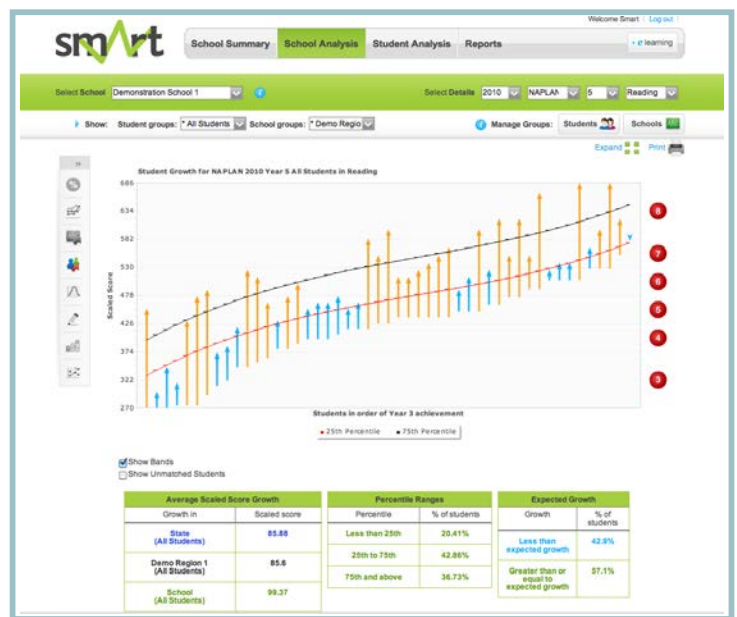
# Student Growth 2010

## Student Growth – Additional Information SMART 2010

Student growth in SMART has been refined to enable the calculation of an expected growth for every starting score point.

The starting score point is the score achieved by students in the test aspect two years previously.

An **orange arrow** indicates student growth that is greater than or equal to the expected growth for that starting point.  
A **blue arrow** indicates student growth that is less than the expected growth for that starting point.



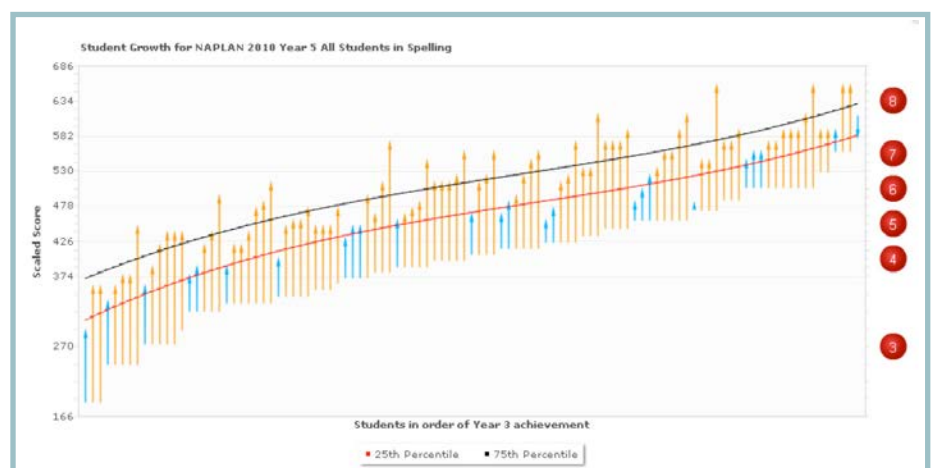
SMART will report the percentage of students whose growth has been:

- greater than or equal to expected growth
- less than the expected growth across all starting points for matched students.



Expected Growth	
Growth	% of students
Less than expected growth	42.9%
Greater than or equal to expected growth	57.1%

Generally, there will be higher expected growth values at the lower starting point and lower expected growth values for the higher starting point plotted on the graph.



## **Appendix F Results from Rasch Analysis**

Rasch analysis results follow on the next three pages.

# All Questions Scale Item Fit

all on all (N = 46 L = 57 Probability Level= .50)

INFIT MNSQ

	.63	.71	.83	1.00	1.20	1.40	1.60
1 item 1	.	.	.	*	.	.	.
2 item 2	.	.	.	.	*	.	.
3 item 3	.	.	.	*	.	.	.
4 item 4	.	.	.	*	.	.	.
5 item 5	.	.	*	.	.	.	.
6 item 6	.	.	*	.	.	.	.
7 item 7	.	.	*	.	.	.	.
8 item 8	.	.	.	*	.	.	.
9 item 9	.	.	*	.	.	.	.
10 item 10	.	.	*	.	.	.	.
11 item 11	.	.	.	*	.	.	.
12 item 12	.	.	*	.	.	.	.
13 item 13	.	.	*	.	.	.	.
14 item 14	.	.	*	.	.	.	.
15 item 15	.	.	*	.	.	.	.
16 item 16	.	.	*	.	.	.	.
17 item 17	.	.	.	.	*	.	.
18 item 18	.	.	*	.	.	.	.
19 item 19	.	.	.	*	.	.	.
20 item 20	.	.	*	.	.	.	.
21 item 21	.	.	.	.	*	.	.
22 item 22	.	.	.	.	*	.	.
23 item 23	.	.	.	.	*	.	.
24 item 24	.	.	*	.	.	.	.
25 item 25	.	.	.	*	.	.	.
26 item 26	.	.	*	.	.	.	.
27 item 27	.	.	.	.	*	.	.
28 item 28	.	.	.	.	*	.	.
29 item 29	.	.	.	*	.	.	.
30 item 30	.	.	*	.	.	.	.
31 item 31	.	.	*	.	.	.	.
32 item 32	.	.	*	.	.	.	.
33 item 33	.	*	.	.	.	.	.
34 item 34	.	.	*	.	.	.	.
35 item 35	.	.	*	.	.	.	.
36 item 36	.	.	.	*	.	.	.
37 item 37	.	.	.	.	*	.	.
38 item 38	.	.	*	.	.	.	.
39 item 39	.	.	*	.	.	.	.
40 item 40	.	.	.	.	*	.	.
41 item 41	.	.	*	.	.	.	.
42 item 42	.	.	.	.	.	*	.
43 item 43	.	.	*	.	.	.	.
44 item 44	.	.	.	.	*	.	.
45 item 45	.	.	.	.	*	.	.
46 item 46	.	.	*	.	.	.	.
47 item 47	.	.	*	.	.	.	.
48 item 48	.	.	.	.	*	.	.
49 item 49	.	.	.	*	.	.	.
50 item 50	.	.	*	.	.	.	.
51 item 51	.	.	.	.	*	.	.
52 item 52	.	.	.	.	*	.	.
53 item 53	.	.	.	*	.	.	.
54 item 54	.	.	.	*	.	.	.
55 item 55	.	.	*	.	.	.	.
56 item 56	.	.	.	*	.	.	.
57 item 57	.	*	.	.	.	.	.

Item Number	Item text
Item 1	What Year are you currently enrolled in at school?
Item 2	What year did you become involved with VSSSP?
Item 3	Approximately how many high school students does your base school have?
Item 4	Do you identify as being of Aboriginal or Torres Strait Islander descent?
Item 5	I enjoy being part of VSSSP.
Item 6	My skill level with respect to technology in general, prior to commencing VSSSP was excellent.
Item 7	My skill level with respect to technology in general now is excellent.
Item 8	VSSSP has helped develop my digital presentation skills significantly.
Item 9	My ability to manage unexpected events before I joined VSSSP was excellent.
Item 10	My ability to manage unexpected events now is excellent.
Item 11	Other students in VSSSP are far more talented than me.
Item 12	The weekly work in VSSSP is challenging.
Item 13	The assessment tasks in VSSSP are challenging
Item 14	In general I find the pace of work in my VSSSP classes to be the right pace for me.
Item 15	Being in VSSSP supports my creative side.
Item 16	I always know what is expected of me in an VSSSP assessment task
Item 17	Not being able to see the teacher physically during lessons is a limitation.
Item 18	My VSSSP teachers make me feel welcome in every lesson
Item 19	With regard to your academic abilities how do you regard yourself?
Item 20	The virtual classroom environment suits me better than a regular classroom environment.
Item 21	I feel isolated in VSSSP.
Item 22	The assessment tasks in VSSSP are hard to understand
Item 23	It takes far too long to find my work on Moodle.
Item 24	I have found friends readily in VSSSP.
Item 25	I communicate with VSSSP students from other schools regularly outside my virtual class lesson times.
Item 26	I enjoy being able to meet other talented students.
Item 27	I really do not like the virtual classroom environment.
Item 28	My VSSSP teachers are hard to communicate with.
Item 29	VSSSP Moodle is well organised.
Item 30	Before I started in VSSSP my time management skills were effective.

Item Number	Item text
Item 31	Since I have been in VSSSP my time management skills have improved
Item 32	I feel that I belong in VSSSP.
Item 33	I am a very organised person.
Item 34	I take part in many extra-curricular activities such as music, sport or debating.
Item 35	VSSSP is a very flexible school provision.
Item 36	Residential school is an essential and integral part of the virtual school environment.
Item 37	The lessons at residential school are always boring.
Item 38	My teachers in VSSSP know me well as a person.
Item 39	I feel comfortable talking to my VSSSP teachers about anything.
Item 40	I am or have been bullied or harassed by people in VSSSP.
Item 41	I am or have been bullied or harassed by people at my local school for being an VSSSP student.
Item 42	Other VSSSP students are not like me.
Item 43	My VSSSP teachers really know their subject material.
Item 44	It is hard to do anything differently in VSSSP, things are always very rigid.
Item 45	I never get to say anything in a virtual lesson because the teacher ignores me.
Item 46	I would describe myself as a motivated student.
Item 47	I work well without close supervision.
Item 48	The necessary timetable changes in VSSSP interrupt my learning.
Item 49	Virtual lessons (synopps) should go for a longer time.
Item 50	My teachers are always well prepared for virtual lessons.
Item 51	Residential school is not necessary.
Item 52	If I was not in VSSSP I would not attend my local high school.
Item 53	It is important to have a balance between physical activity, school work and family time.
Item 54	Technology skills will be useful in the future workplace.
Item 55	I would recommend VSSSP to other talented students.
Item 56	I have many ideas about new and different ways to do things
Item 57	I can express my ideas for new and different ways to do things in VSSSP.