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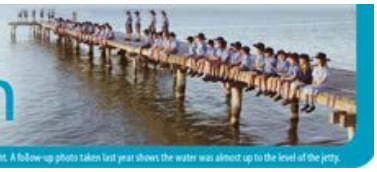

CREATIVE USE OF DIGITAL TECHNOLOGIES: KEEPING THE BEST AND BRIGHTEST IN THE BUSH

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ABSTRACT

Gifted students have been provided the opportunity to study three core subjects through an academically selective virtual high school in western NSW, Australia. At the same time these students continue to attend their local public high school for their other subjects. This article presents the mechanisms that have provided this opportunity, and describes successes and challenges. Students are located across 385,000 km^2 and meet online through web conferencing to engage in real time. They are also able asynchronously to access study materials in an online repository.

Key words: Rural education, virtual schooling, online repository

INTRODUCTION

Australia is a large country and New South Wales (NSW) is a large state where most schools (62%) are administered by the NSW government through the Department of Education and Communities (DEC). Until recently, this administration of public schools was devolved into 10 regions with Western NSW Region (WNSWR) covering a large area of some 385,000 square kilometres with total secondary school enrolments of just under 17,000 students attending 45 Central and Secondary schools (NSW DEC, 2012).

A phenomenon observed for decades has been a significant 'brain drain' from rural and regional areas (Brett, 2011; St George, 2011) owing in part to educational opportunities available in metropolitan areas that have not been available in these rural and regional areas. The lack of a large cohort of similar-ability students has seen many parents send their children to boarding schools (schools where students live on campus during the school term), often in a metropolitan area. The practice of sending children to boarding school, for those families who can afford this option, has an impact on the family unit as well as the capacity of local schools and the attractiveness of these schools for prospective staff (Brett, 2011). The 'tyranny of distance' (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 & Lubiensky, 2014; Riddle, 2014; Thomson, De Bortoli, & Buckley, 2012). Perry and Lubiensky (2014) explain social stratification in the Australian education system as being *sharper than in most countries. Students from wealthy, privileged backgrounds tend to go to high-fee, independent schools. Kids from low-income, disadvantaged backgrounds tend to go to government high schools.*

One way that educational opportunities have been expanded for students is by the provision of selective high schools. In these schools students of high academic ability are grouped together. Until

2010 there had not been a selective high school available to Western Region students unless they were prepared to leave home to attend a school in a metropolitan area or one of the two agricultural high schools in large regional centres. This paper describes a unique provision that was offered to 120 rural gifted students in Western Region, to allow them the opportunity of a selective high school experience in their own rural area. At the beginning of 2014 the school was extended across the state but is described here as it still existed at the time of writing in 2013. Before this provision is described in detail, the section below summarises the selective school system in NSW.

EDUCATION FOR GIFTED STUDENTS IN NSW

At a national level 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 (the Australian Curriculum, ACARA, 2013) and in state policies. In NSW, the DEC has for many years required all school communities to identify and support the academic, social and emotional needs of their gifted and talented students, and has since the 19th century provided selective high schools that group together students of high academic ability. There are currently 47 selective high schools in NSW (NSW DEC, 2010a), some of which are fully selective while others are partially selective, having both selective and community classes.

The number of student places available in these schools is limited by a quota and entrance is via a state-wide Selective High School Placement Test in Year 6 to gain entry in Year 7. The Australian Council for Educational Research creates and administers this test (2012), which measures ability in reading, writing, mathematics and logic and is set to discriminate at a very high level. The design of these tests makes it very rare for even the most able candidates to score full marks.

In a typical year, students who gain entry to any selective high school will be in the top five to ten per cent of the cohort. In some years, it may be that students are in the top one to five per cent of the cohort. Provision is made for special examination conditions for gifted students with other special needs such as a physical disability or other condition such as Asperger's Syndrome. The tests assume a high standard of written English. More than 13,500 applicants contested 4,164 student places in 2013 (NSW DEC, 2013a).

STUDENTS IN WESTERN NSW REGION

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 high school. Larger regional centres may have comprehensive high schools with up to 200 students in each grade, 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 (Edwards & Baxter, 2013; St George, 2011; Wood & Zundans-Fraser, 2013).

A response to these issues was developed capitalising on the equipment and infrastructure made available through a combined Federal and NSW Government initiative, the *Digital Education Revolution* (NSW DEC, 2010b). This initiative included the Connected Classroom Project (NSW DEC, 2010c) and the Bandwidth Enhancement Project (NSW DEC, 2010d). The virtual provision also used software made available through DEC Enterprise agreements with software providers (NSW DEC, 2010e). These initiatives, coupled with the announcement of more student places in selective high schools, allocated to rural and regional areas (NSW Parliament, 2008), allowed development of a way to deliver a high-quality curriculum to gifted students whilst they attend their local public high school and remain in the family home.

All but one of the ten school administrative regions across NSW allocated their student placements to an existing high school, making it a partially selective high school (NSW DEC, 2013b). Western NSW Region (WNSWR), however, chose to allocate their student placements to the formation of a new *virtual* selective high school, a decision based partly on the large geographic area of WNSWR. If the placements had been allocated to any existing high school within the region's large population centres, more students would have been disadvantaged than advantaged. In 2010 *xsel* Virtual Selective High School Provision (VSHSP) began. The next two sections describe how *xsel* VSHSP works for students and staff.

HOW *XSEL* VSHSP WORKS: STUDENTS

xsel Virtual Selective High School Provision caters for gifted secondary school students in rural and remote Western NSW. As mentioned previously, any student wishing to apply for a NSW Selective High School, including the virtual selective provision, must self-nominate and complete a unique test 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 for Year 7. Parents and primary school Principals must be aware of this process and the lead time required. Once selected for the *xsel* Virtual Selective High School, students still attend their local public high 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.

xsel uses a blended learning approach. By supporting academically able students in their local community and meeting their educational needs using 21st century technologies, *xsel* nurtures talent and grows the potential of the student and the community. In this way the vision of *xsel*, to bring the selective high school curriculum to students in their local public secondary school, is a reality.

Not all compulsory areas of study in NSW transfer easily to a digital delivery method. For this reason the decision was made to limit the curriculum to English, mathematics and science for the virtual selective high school provision. When the local cohort is timetabled for English, mathematics or science, *xsel* students move to a quiet space in the school to attend online lessons or complete work from the digital learning repository. At no time do the *xsel* students attend English, mathematics or science classes at their local high school.

This model enables high-ability students to stay 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 the special needs of these students. In the past, many of these gifted students left their local communities to attend boarding or residential schools in large metropolitan areas, depleting local communities.

HOW *XSEL* VSHSP WORKS: STAFFING

A unique staffing model has been developed to allow teachers to work with selective high school students whilst remaining in their own local public high school. As such, these teachers are valued members of two schools (NSW Department of Education and Training, 2009). *xsel* teachers are seconded for 40 per cent of their full-time duties to teach in the VSHSP. They design, deliver and assess all content. The relevant mandated NSW Board of Studies syllabus is used as the basis of the instruction; however, curriculum compacting and extensive use of pre-testing allow for time to be spent on extension and enrichment material. In addition, teachers use open and flexible e-learning strategies encouraging collaboration and problem solving through a wide variety of technologies. Students are continuously scaffolded in their learning in light of their individual learning needs. Programs reflect best practice in gifted pedagogy and include rigorous and supported educational challenges, regular opportunities to work independently and with other like-minded peers, subject acceleration, and differentiated curriculum in terms of content, process and product (Chandra Handa, 2009; Maker, 1982; Rogers, 2007; VanTassel-Baska & Brown, 2007). The ratio of teachers to students in *xsel,* at the time of writing, is currently 1:10.

Prospective staff must teach in a Western NSW region DEC school and be curriculum experts as well as excellent teachers with a good command of technology in education. Above all, staff must be supportive of the concept of gifted education, and be flexible and adaptable. Teachers receive training in gifted education strategies, in the use of web-conferencing software, and in the use and organisation of the NSW DEC digital learning management system that includes instructional design for web-based learning materials. Excellent organisation of learning materials is critical to the success of teaching and learning in this environment. Senior executive in the school monitor and support staff either through personal visits to the school or by using technology. Classroom visits, as traditionally practised by 'bricks and mortar' executive, are conducted virtually.

The blended learning model ensures regular contact between teachers and students, and a residential school is held over two days once every school term (four per year). *xsel* uses web-conferencing software to deliver synchronous lessons in real time with the learning management system housing all learning materials for later asynchronous learning.

Significant time, effort and cost were required to set up this different type of selective high school. Research that justifies such expenditure of resources is presented in the following sections.

RESEARCH AND PRACTICE UNDERPINNING *XSEL* VSHSP

A wide variety of research has been used to underpin this ground-breaking provision. The forward planning for the provision began in 2007 when there was very little e-learning research available upon which to base decisions. Instead, the provision was planned as if it were a 'bricks and mortar' school. It was only when the Principal and the Teaching, Learning & Technology Officer were employed in 2009 that there was recognition that this provision needed to be something else entirely. The foundation Principal is quoted as saying, *It's like building a plane in mid-air when the service manual is also being written at the same time* (W.S. Adams, personal communication, 10 November 2009). A focus on gifted education research, such as the forced-choice dilemma (Gross, 1989), and a determination to bring staff and students safely into the e-learning environment, as suggested by the five-stage framework and e-learning principles of Salmon (2002), have helped shape teaching and learning. Research on constructivist pedagogy (Le Cornu & Peters, 2005) was used to assist with the development and delivery of induction packages for staff. Research by Porter (2001) also helped with developing a shared understanding of what kind of growth in understanding of technology could be expected and should be required from both staff and students. As the *xsel* virtual school was new, there was no blueprint to follow. Despite a small number of other virtual provisions being in operation globally, none was similar to *xsel* VSHS.

Each Australian State and Territory has a policy for gifted education that mandates a modified curriculum for gifted students to achieve their potential. The NSW DEC has adopted Gagné's (2003, 2008) Differentiated Model of Giftedness and Talent (DMGT) as one of the pillars underlying its Gifted and Talented Policy. In this model, the gift (natural potential) must go through a process of transformation by the application of effort, time and money to be revealed as a talent (actual). Gagné (2010) has since updated this model to have a more comprehensive description of the impact of various catalysts in the transformation process and it is this updated model that is the preference of practitioners within the gifted education sphere.

The gifted education research of Maker (1982), Gagné (2008), Gross, McLeod and Pretorius (2001), Neihart and Betts (2008) and Reis, Burns and Renzulli (1992), and studies on learner-centred classrooms (Chandra Handa, 2009), have informed staff, students and parents of the nature and needs of the student body. For example, there is wide international acceptance of and rigorous research to support differentiation of the curriculum for gifted students. Maker (1982) developed a differentiation method that is widely used internationally. She suggests that differentiation can be achieved by modification to any or all of content, process, product or learning environment and that grouping like-ability students together is sound practice. Other authors support her views about grouping to facilitate better educational outcomes (Gentry & Mann, 2008; Henderson, 2007; Riley, Bevan-Brown, Bicknell, Carroll-Lind, & Kearney, 2004; Rogers, 2002a & 2002b; Tomlinson, 2013; Winebrenner & Devlin, 2001, as cited in Bate & Clark, 2013).

In a comprehensive meta-analysis of over 200 research articles from 1861 to 2006, Rogers (2007) supports these practices, along with others that can enhance outcomes for gifted students:

1. daily challenge in the work offered to gifted students;
2. opportunities for independent work with structured support to develop independent study skills;
3. opportunities for acceleration (curriculum compacting, subject and year advancement);
4. opportunity to work with like-ability peers; and
5. curriculum modification to take into account the learning needs of gifted students such as a faster pace of learning and the need for less practice and review.

There is also a considerable body of evidence for the need to understand and support the social and emotional needs of gifted students in order to facilitate positive educational outcomes. Some social and emotional 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 (GERRIC, 2004).

The final area of relevance within gifted education research is the impact of the teacher. Several studies have investigated the desirable characteristics of teachers of gifted students as seen by the students themselves (Bramwell, Reilly, Lilly, Kronish, & Chennabthni, 2011; Chan, 2011; Vialle & Tischler, 2009). The necessity for creative teaching and a positive attitude to gifted students is described in these studies.

The virtual school in this paper has congruence with several of these pillars of gifted education research. Through an entry process administered by the NSW DEC, students are identified as being in the top one to five per cent of the state-wide cohort. Applying the DEC's own Gagné-driven policy, this group of students can be considered as gifted. The students then begin their journey as a group of like-minded students when they join the virtual school provision.

Grouping high-ability students together for at least part of their learning thus has support in the research literature. The *xsel* VSHSP allowed such students to be grouped together virtually. In the following section, therefore, we summarise research supporting online learning for high school students.

RESEARCH INTO ONLINE LEARNING FOR HIGH SCHOOL STUDENTS

There is a body of research to support online learning for high school students. It is a relatively new field compared to gifted education research but it is growing. There are essentially two sentiments that drive the incorporation of ICT into teaching and learning:

> *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).

and

> *Rapid and continuing advances in information and communication technologies (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* (Australian Government, 2008, p. 5).

ICT pedagogies enforce student-centred learning as a modality. Grappling's Technology Spectrum (Porter, 2001) is an instructional framework charting three broad categories of technology uses for teaching and learning: 1) Literacy Uses 2) Adapting Uses and 3) Transforming Uses. By ensuring the transformation end of Grappling's Technology Spectrum (Porter, 1995) is used as far as possible, there is the chance of an alignment of student-centred learning in ways that are not possible without technology.

A report on the progress of the Connected Classrooms Program (NSW DEC, 2010c) describes the need for 21st-century techniques to develop graduates who will be employed in a 21st-century workplace. The skills of these graduates should include critical thinking and problem solving; collaboration across networks and leading by influence; agility and adaptability; initiative and entrepreneurship; effective oral and written communication; accessing and analysing information; and, curiosity and imagination (NSW DEC, 2010c, p. 9). As well, the Australian Council for Deans of Education describes 21st-century learning as follows:

> *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, cited in McLeod & Reynolds, 2007, p. 144)

These statements reflect sentiments that are highly regarded by many and yet the research is scant into whether or not, some 10 years after the drafting of the ideas, these attributes can be seen in high school graduates. Rapposelli (2012) reported that students engaged in online learning described the benefits as the capacity to submit an electronic form of an assignment and working with others at another location. Groundwater-Smith (2007) reported that students enjoyed constructing their own knowledge rather than writing down the version of knowledge constructed by the teacher but that

they found the internet-filtering environment of NSW DEC schools a hindrance to learning. Bennett and Barbour (2012) reported that students of Maori descent sought more opportunity for collaboration and interaction when engaged in online learning. These authors also suggest the need for better preparation of teachers for an e-learning environment.

Kimber and Wyatt-Smith describe creativity 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* (2010, p. 610).

Further discussion by Kimber and Wyatt-Smith (2010) on the links between creativity and critical engagement suggests the possibilities of multimodal assessment strategies to develop skills in accessing and using different mediums to better reflect the current digital learning environment.

Virtual school teachers are able to use the Internet and video-conferencing equipment to communicate with students who are living at a distance. This dialogue enables *interaction between the teacher who originates the instruction and the remote student … communication is facilitated among students, either individually or as groups, but at a distance* (Bates, 2005, p. 7). Student interaction in an online learning space is the focus of several other research articles. Ingerham (2012) describes three types of student interactions in an online space: student–content, student–teacher, and student–student. There is considerable evidence that the need for student–student interactions as described in the North Carolina Public School experience and the FarNet (Bennett and Barbour, 2012) experience in New Zealand are of real concern to students. A study by Vu and Fadde (2013) indicated that tertiary students in a live virtual classroom (LVC) preferred to use the typed 'chat' feature rather than voice to communicate owing to technology difficulties with increased bandwidth usage for voice/video features. This research is important because the same virtual classroom software is used in the virtual selective high school provision. The student–student interaction was highly valued in all three studies.

In Australia, the literature is scarce in relation to 'distance education', 'online learning', or 'virtual schools' in secondary education. However, there have been several reports internationally. A Report from the USA Department of Education (Setzer & Lewis, 2005, p. 1), stated that *technology-based education at the elementary and secondary levels enables school districts to expand the range of courses available to their students and may facilitate more flexibility in student schedules and instructional delivery.* At the time of this report, there had not been any national studies that examined the availability of technology-based distance education, the courses offered or the enrolments. However by 2004, Cavanaugh, Gillan, Kromrey, Hess and Blomeyer undertook a meta-analysis examining the effects of distance education on K–12 students in Illionis and found that there had been six studies reported. Cavanaugh et al. (2004) found that online schools were ideally situated to meet the needs of the 21st-century learners and the number of students learning online had increased dramatically. Online education is successful if the teachers are required to be autonomous and the students take on greater responsibility for their own learning (Cavanaugh et al., 2004). In the United Kingdom, Bates (2005) states that if a school can be deliberate with the selection of its students, such as *xsel* has done, then it has more flexibility in relation to the choice of technology used with students.

Finally, we bring the previous specified areas of research together in the following section to describe what the literature tells us about online learning for gifted high school students.

RESEARCH INTO ONLINE LEARNING FOR GIFTED HIGH SCHOOL STUDENTS

This area of research is the one with fewest reports in the literature. If the caveat of research into online learning for gifted *Australian* high school students is added, only two articles surface.

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: *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 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.

Further research by Ng and Nicholas (2010) was a case study into the effectiveness of online pedagogy as used by 10 students in an extra-curricular activity over six months. This study describes the support mechanisms required, such as a teacher mentor onsite, the retention rate of students and the need for 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 student–student social and academic collaboration online is a feature of this case study.

Thompson (2010) reports the first in-depth investigation of gifted students completing curriculum online with a comprehensive description of perceptions of both teachers and students, albeit with very small sample sizes, and of how the online space can meet the needs of gifted learners. A feature is the discourse on access to broader educational opportunities in an online environment than in a regular school environment. Thomson 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. She concludes 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* (p. 267) and suggests the need for further research.

Recent research into virtual faculties that operate independently of *xsel* in Western NSW Region also supports the professional learning opportunities available through collaboration (Manwaring, 2012). The benefits of a larger staff cohort are described, allowing early career teachers to seek advice and support from more experienced teachers in regular and formalised ways. This process is facilitated through the existence of virtual faculties that link together experienced Head Teachers with a group of early career teachers in small rural and remote isolated schools where they are often the only teacher in that faculty and thus have no-one in their own subject area to turn to for support. Manwaring (2012) found that this pressure contributed to early career teachers feeling isolated and unsure if their learning and assessment materials were of adequate quality, especially in the HSC years. In addition, Manwaring found that this isolation can be a factor preventing smooth transition from pre-service teaching to early career teaching. The virtual faculties became a support mechanism, with participants in the study reporting they felt better able to prepare sound assessments and teaching programs that met the needs of a range of learners at their school (Manwaring, 2012, p. 56). The staff in the virtual faculty also planned common assessment tasks so they could better gauge the progress of their own very small student cohorts when combined with the larger cohort through the networking opportunities provided by the virtual faculty.

What research is available thus supports, for gifted high school students, the concepts of curriculum adaptation and online learning with like-minded peers. The question then becomes, does the evidence so far for *xsel* students support these findings? In the following section we describe some of the findings related to the xsel students' achievements and to teacher professional development.

SUCCESSES OF *XSEL* VSHSP

All secondary school students in NSW sit standardised tests in Years 7, 8 and 9 and at the end of Year 12. These tests include a measure of literacy and numeracy (NAPLAN, DEC, 2010f) as well as of science knowledge, through the Essential Secondary Science Assessment (ESSA) (NSW DEC, 2010g). Students have to date received feedback in ESSA (NSW DEC, 2010g) for three consecutive years. Results are shown in Figures 1, 2 and 3. Data for the National Assessment Program Literacy and Numeracy (NAPLAN) (NSW DEC, 2010f) for Year 7 are collected within the first few weeks of the year, making them unreliable as an indicator of student progress in the unique *xsel* learning environment. However NAPLAN data for Year 9 are available for one cohort, as indicated in Figure 4.

Table 1 shows a brief description of the different components of the ESSA test and is an explanation of the horizontal axis in Figure 1, Figure 2 and Figure 3.

Table 1: *Explanation of horizontal axis in Figure 1, Figure 2 and Figure 3*

Horizontal Axis Label	Description
Overall	Average of all components of the ESSA test
Extended Response	A measure of deep understanding and use of appropriate scientific metalanguage to explain 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 to understand and respond to a range of scientific information in a variety of media
Working Scientifically	A measure of skills in planning and conducting investigations in addition to thinking critically to solve problems

Figure 1 shows the ESSA results for the inaugural Year 7 cohort of 2010 as at the end of Year 8 2011. These students were the first in the virtual provision and as such these were the first external data available on the progress of *xsel* students. Results are shown for all students in NSW, for students in the Western Region of NSW, for *xsel* students, and for students in other Selective Schools. These latter data are an average of results from 17 fully selective high schools, and thus allow a comparison of *xsel* to a similar cohort.

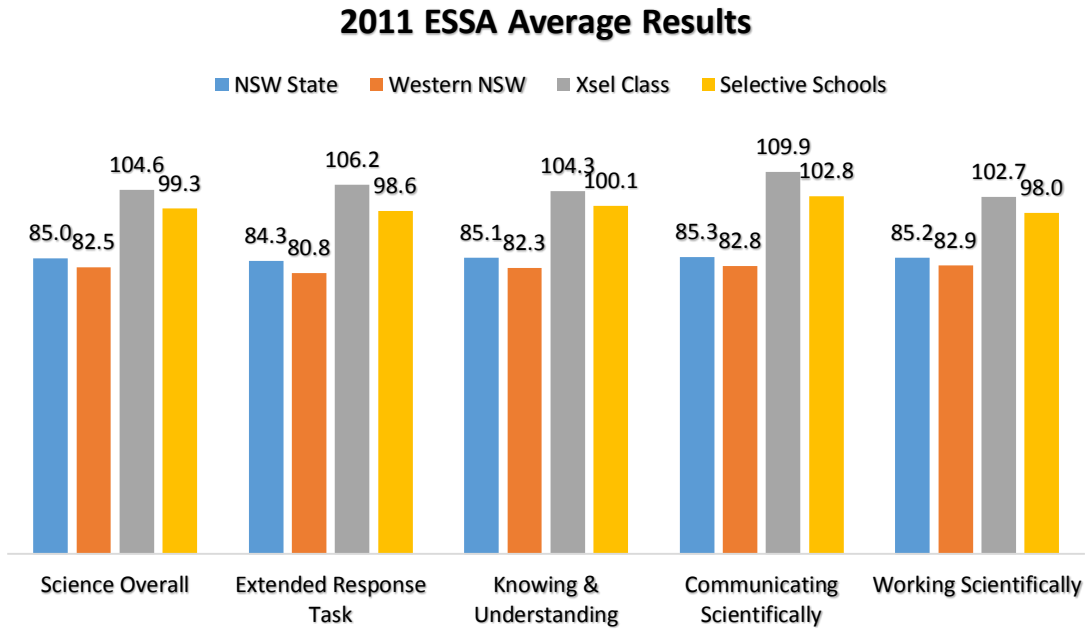

Figure 1*: Essential Secondary School Assessment (ESSA) 2011*

Figure 2 shows the ESSA results for the second cohort of Year 7 students (2011 intake).

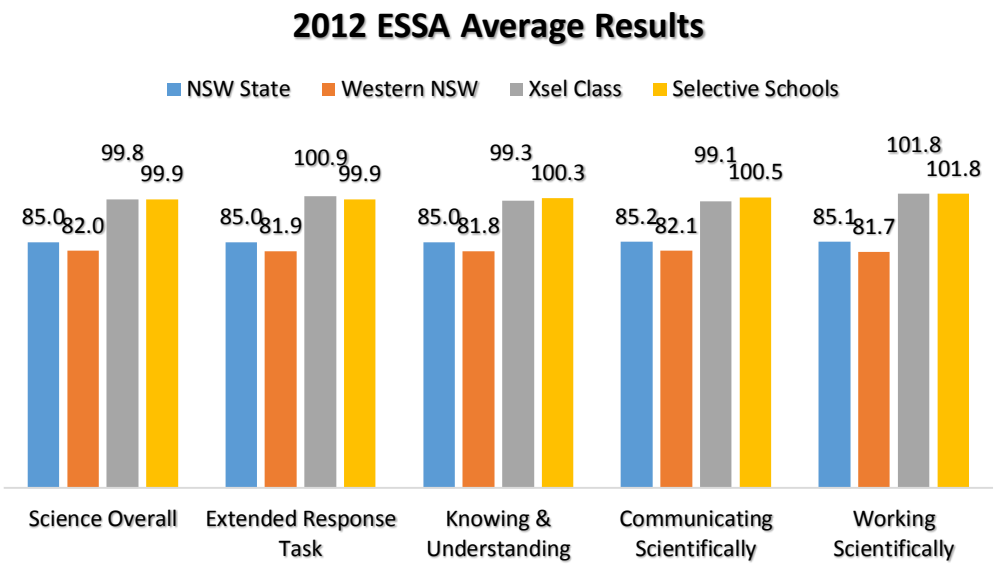

Figure 2: ***Essential Secondary School Assessment (ESSA) 2012***

Figure 3 shows that for an extended period of time the virtual provision has been able to attain results in the ESSA test similar to or better than the 'similar cohort' results from other selective schools.

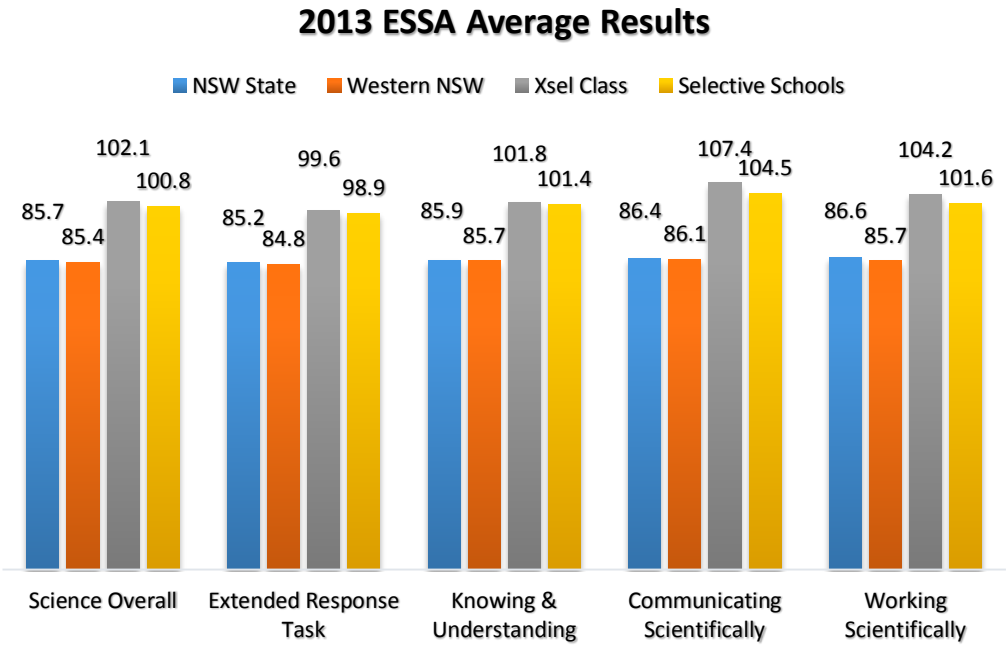

Figure 3: ***Essential Secondary School Assessment (ESSA) 2013***

Figure 4 shows the average growth as reported by NAPLAN results for students in Year 9 2012. Students in WNSWR with the same Year 7 NAPLAN score start points as the VSHSP cohort have been compared. These students could be considered to have similar abilities to the VSHSP cohort as measured by NAPLAN. WNSWR sample for Reading consists of 380 matched students. Student starting points for Reading in Year 7 range from 523 to 722. WNSWR sample for Numeracy consists of 482 matched students. Student starting points for Numeracy in Year 7 range from 546 to 797. The *xsel* VSHSP sample is made up of 23 matched students (seven students being absent for either the Year 7 or Year 9 phase of the NAPLAN test).

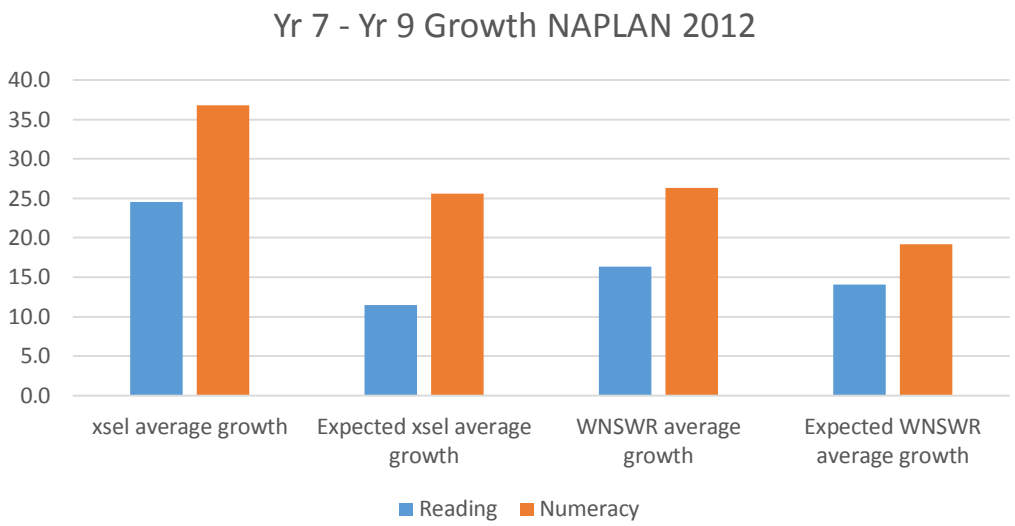

Figure 4: ***Comparison of expected growth to actual growth in NAPLAN Year 9 2012***

In addition to excellent results in the ESSA and NAPLAN standardised tests, there is anecdotal evidence of a number of other ways in which *xsel* is achieving very well. The first evidence is in the development of levels of autonomy within the student cohort. A consistent learner-centred approach (Chandra Handa, 2009) means that students develop the skills to work independently and to take responsibility for their own learning. Parents and students report the students' time management skills are highly developed after 3–4 months in the *xsel* environment.

Perhaps the largest success has been in the students' realisation that there are others just like they are. Gross (1989) describes the 'forced-choice dilemma' for many older gifted students, that is, *the belief held by some intellectually gifted students that they must choose between academic achievement and peer acceptance* (Jung, McCormick, & Gross, 2012, p. 15). The intersection of identity, autonomy, intimacy and achievement is not always a neat fit for high-ability students and words like 'masking', 'camouflaging' and 'dumbing down' may describe the consequences to academic achievement that result from ensuring social acceptance amongst peers.

If, however, students have the opportunity to work with like-minded, high-achieving peers, the perceived conflict and need to choose between academic achievement and peer acceptance is reduced. The students in *xsel* seek support from each other and provide confirmation that they are members of a group of similar students making this forced-choice dilemma unnecessary.

A third success is in the flexibility of the provision that allows students gifted in more than one domain to follow their passions and still remain up-to-date with school work. Several students represent the state of NSW and/or Western NSW Region in sport and music in addition to maintaining excellent school grades. The flexibility of accessing lessons and work to be completed from a digital repository at a time convenient to the student has allowed students to attend lessons when flood-bound, or when away from school for sport, music, or debating or for extended family holidays where parents have requested work for their child. One student continued to attend synchronous lessons whilst the family travelled overseas on extended sabbatical leave.

Finally, staff in Western NSW region can now teach in a selective high school environment without having to move to a metropolitan area. Often there are deep, local connections that cannot be changed (such as family farms) and these connections prevent true mobility of teachers. The virtual selective high school provision allows for significant professional development over an extended period of time and collaboration with staff across the region, not just in one school. When considering the great distances involved, communication is a significant issue to overcome.

Results in terms of student achievement and teacher professional development have been very encouraging but challenges have had to be overcome to allow these achievements to occur. Expansion of the virtual provision to the senior years of high school will present further challenges. The last section below looks forward to describe future directions in the selective virtual provision.

FUTURE DIRECTIONS, CHALLENGES AND CONCLUSIONS

One of the biggest challenges encountered has been the lack of information available upon which to base this type of schooling provision, which is at the forefront of changing educational paradigms. Regular 'bricks and mortar' schools use paradigms developed over a century ago and as such, have a wealth of global experience for reference. A further challenge is the selection of students. Whilst all are academically capable, the provision works best with students who have inherent volition and self-motivation. These students quickly develop the autonomous learning style required for a low supervision model. The current Selective High Schools Placement Test cannot provide accurate information about autonomy. Nevertheless the results presented graphically above are extremely positive in terms of supporting the success of this ground-breaking selective provision for gifted rural students.

The challenging curriculum in the final two years of school (Years 11 and 12) means the current delivery model will need to change if the provision is to extend into the final two years of schooling. Exit examinations at the end of Year 12 determine university entry, making these years of school critical. The extended curricula in mathematics, English and the sciences require sustained conversations for the development of deep understanding of the curriculum material. With current live lessons limited to 25 minutes, this development will pose additional challenges.

xsel, as NSW's first virtual selective high school provision is challenging traditional models of schooling by establishing partnerships between secondary schools across a vast area. This collaboration is providing strength through knowledge to individuals and communities. Academic results as shown by the standardised NAPLAN and ESSA tests have been very encouraging. We know the virtual selective provision provides appropriate curriculum for students, allowing them to achieve strong results. What we now need to investigate is the role of particular factors in helping students achieve these results, such as those factors identified by Rogers (2007); the importance of the teacher and other support networks; the influences on students' social and emotional needs and development; and how the students, teachers and parents evaluate the experience of a virtual selective high school.

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