The Executive Officer

Education and Training Committee

Parliament House

Spring Street

EAST MELBOURNE 3002

26th May 2010

Dear Mr. Southwick MP,

I am writing this letter in regards to your recent inquiry into the education of gifted and talented students. My name is Carolyn Ferguson and I have been a teacher and co-ordinator within Victorian schools for almost 20 years. I was also the Southern Independent Schools (S.I.S.) Secretary for 6 years whereby I organised and ran all sporting events for 19 independent schools and oversaw the interschool events for art, music, debating, chess, theatre sports and other similar programs. I was also an International race-walker and more recently I am near the completion of my Masters in Education, specialising in gifted and talented education, which I have completed full-time, resigning from my teaching position to focus on my studies.

Within the last few years of teaching I became very disillusioned with the education of teaching gifted and talented students. As a mathematics teacher I was not allowed to extend gifted students within my school beyond giving further work which was “boring” to these students. There was no program in place for gifted and talented students, except for year 10 students who could take on a VCE subject.

At the same time my 5 year old daughter was twice tested by her speech therapist using two different achievement tests. I am of the belief that she must of thought she was not ready to begin school. The results of both tests she used found my daughter to be in the 99-100th percentile for each test in all but one area. Consequently a letter was written to the government school she
was going to attend to advise them that she would need further stimulation within the classroom. Unfortunately the school removed the enrichment program before she could become involved.

My older son was also experiencing difficulties at school because he was so “bored” and “unchallenged”. Test results in National competitions showed him to be in the top 0.3% of students a year older which was also reflected in his Year 3 NAPLAN results last year. The government school where my children attended had not only removed the enrichment program, which was my one of my son’s highlights for the week, but also removed the science program, with a wonderful specialist science teacher, German and music. For the majority of his 3 ½ years at this school the teachers could not understand his characteristics as being gifted and his time there within the final 6 months have left psychological scars by the actions of the last teacher.

Now at a private school my son is offered challenges again and his gifts are more recognised. He is again involved in enrichment classes, private music lessons, is chess vice-captain, and is offered an array of National competitions and extra-curricular activities to keep him stimulated. Although still not the ultimate educational facility, as he still lacks the required extension in some subject areas, he is happier and more challenged.

These more recent events created an enthusiasm into learning more about gifted and talented students and prompted my Masters studies. As the school offered no financial assistance or time release for me to study I resigned so I could focus on this interest. Whilst completing my studies I reflected on aspects of my own teaching and realised that in almost 20 years of teaching I had not once been offered professional development on gifted and talented students. I also reflected that whilst at University as a student there were no lectures given on these students. Whilst teaching I received plenty of information on students with disabilities or disorders yet nothing on the gifted and talented.

This has prompted me within my Masters to research some areas I feel are lacking the attention they deserve. Some of these general ideas in my completed papers revolve around the problems faced by ‘gifted young boys’, ‘gifted Adolescent girls’, ‘the lack of acceleration and enrichment opportunities
in Australia’, and ‘the lack of professional development within Victoria on
gifted education’. I am passionate about making a difference in this under-
resourced and unrecognised area of education.

In my final paper I researched ‘How can I introduce professional development
in-services within Victoria to primary and secondary teachers on giftedness?’
The research constantly shows, seen within this paper, and mentioned within
my others, that this is one of the keys to improving the education of our gifted
and talented students. Although I have not forwarded this project, as it is
currently being assessed at Monash University, I will forward my findings at a
later date if you are interested.

I have forwarded my paper titled “What educational options are available for
gifted and talented students within Australia? Is it best to accelerate, use
enrichment, curriculum differentiation, or employ a combination of methods?”
I am hoping this paper can create some discussion and debate within your
inquiry. I am glad that this enquiry is occurring at a time when I feel the
education of these children is at a crisis point. I would love to be involved in
any way possible to help overcome this current situation within many of our
schools.

Thank you for your time

Carolyn Ferguson
“What educational options are available for gifted and talented students within Australia? Is it best to accelerate, use enrichment, curriculum differentiation, or employ a combination of methods?”

By

Carolyn Ferguson
“What educational options are available for gifted and talented students within Australia? Is it best to accelerate, use enrichment, curriculum differentiation, or employ a combination of methods?”

‘The acceleration versus enrichment argument has been around for more than a century’ (Cohn, 1979; p. 3). The abundant research constantly shows that acceleration is a programmatic option for gifted learners with positive outcomes that are robust and consistent (Wood, Portman, Cigrand, and Colangelo, 2010; Colangelo, Assouline, and Gross, 2004b). But careful consideration for each individual student is essential. The Commonwealth of Australia Senate Committee Report (2001) ‘identified acceleration as being highly advantageous for students who are socially and emotionally ready’ for this option (NSW Department of Education and Training, 2004; p. 8). Depending on the child’s asynchronous development, other alternatives such as enrichment or curriculum differentiation could be used along side or without acceleration within the various talent domains (Davis, Rimm, and Siegle, 2011). But what we must consider is that with the new work of researchers such as Carroll, Sternberg, Gagne, and Gardner our views on giftedness are broadening and therefore as educators we need to embrace these new approaches to identification and assessment in programs (Feldhusen and Jarwan, 2000). This will enable our gifted and talented students to have the opportunity to experience “flow” in their learning (Csikszentmihalyi, 2008).

Acceleration can be defined as ‘an intervention that moves students through an educational program at rates faster, or at younger ages, than typical. It means matching the level, complexity, and pace of the curriculum to the readiness and motivation of the student’ (Colangelo et al., 2004b, p. xi; Wood, Portman, Cigrand, and Colangelo, 2010, p. 169). ‘In particular, acceleration is required for those students identified as highly gifted, exceptionally gifted or profoundly gifted’ (Gross, 1993; [Adelaide] Department for Education and Children’s Services, p. 46). Although there are 18 forms of acceleration, some of the most common forms used in Australia include early enrolment, grade-skipping, subject acceleration, telescoping and the International Baccalaureate (IB) Program (Steenbergen-Hu & Moon, 2011; http://www.qagtc.org.au/acceleration-guidelines-for-parents-and-teachers; Davis, Rimm, and Siegle, 2011). As long as parents, teachers, administrators and counsellors are accurately informed about the academic benefits of acceleration, students can be effectively guided through the process (Wood, Portman, Cigrand, and Colangelo, 2010; http://www.qagtc.org.au/acceleration-guidelines-for-parents-and-teachers).

Grade-skipping, otherwise known as full acceleration, can allow students who are carefully selected to achieve academically, and provides social and emotional advantages (Neihart, 2007). In Australia there have been some excellent longitudinal studies on the long term effects of acceleration on gifted students which showed long-lasting social and emotional benefits (Neihart, 2007; Gross, 1993, 2003; Lubinski, 2004; Lubinski et al., 2001). In Gross’s (1993, 2003; Gross & van Vliet, 2005) study of 60 Australian children with an IQ of 160+ she
found that all 17 radically accelerated students adjusted well, whereas ‘the majority of children retained with their peers experienced significant and lasting difficulties in forming or maintaining friendships’ (Gross & Van Vliet, 2005, p. 159; Neihart, 2007, p. 332). Unfortunately, within Australia, ‘it is deeply ingrained in our society that students should remain with their own age group and that social and emotional problems can arise if there is any departure from this practice’ (Braggett, 1994, p. 87).

Early entrance to school is a form of acceleration commonly considered by parents but unfortunately not highly regarded within educational systems. Within Australia some states such as New South Wales, South Australia, Tasmania and the Australian Capital Territory have provisions for early entry for gifted and talented children. Queensland allows early entry for students who may be disadvantaged if they don’t attend, Victoria only allows this to occur under exceptional circumstances, and Western Australia and Northern Territory have no policy (Diezmann, Watters & Fox, 2001). Research indicates that failure to provide provisions for these gifted and talented youngsters may in fact affect their learning and social development (Burroughs, 1970; Gross, 1993), possibly resulting in underachievement in later years (Davis & Rimm, 1998; Rimm, 1997) (Diezmann, Watters & Fox, 2001). If early entry to school is allowed then it must be remembered that this ‘is not the end of a process of catering for a young gifted child but one step in the formal education process’ (Diezmann, Watters & Fox, 2001; p. 16).

Single-subject or partial acceleration allows a student who has demonstrated advanced knowledge and skills in a single subject by at least one year compared to their peers to accelerate in that subject area (http://www.education.vic.gov.au/studentlearning/programs/gifted/schoolingoptions). This method of acceleration is often seen as a good initial step so that teachers, parents and psychologists can observe the academic and social adjustment of the child in the new setting. If successful the confident decision to incorporate full acceleration for the student can be endorsed (Davis, Rimm, and Siegle, 2011). Rogers (2002) states that ‘for gifted students to make substantial gains in their learning they need to spend the majority of their time in key academic areas with others of similar ability (NSW Department of Education and Training, 2004; p. 14). In Dr. Kim Jaggar’s (Principal, Sydney Boys High School) doctoral research on acceleration it was illustrated that ‘only 7% of subject accelerants surveyed would have preferred to remain with their age mates and approximately 5% of accelerants surveyed would not recommend the strategy’ (NSW Department of Education and Training, 2004; p. 19). The research does indicate that an important factor to successful subject acceleration is that students must be a part of a cohort so that they do not experience social isolation (NSW Department of Education and Training, 2004; Neihart, 2007).

Within Australia, telescoping is one of the more popular choices of acceleration. This involves reducing the number of years in which the curriculum is taught such as completing years 7, 8, 9 and 10 in three years rather than four.
Davis, Rimm, and Siegle, 2011). In Victoria, this form of acceleration has been widely utilised with the adoption of the Select Entry Accelerated Learning (SEAL) Program. This program has the option for high ability students to complete six years of schooling in five, with like minded peers, at a more suitable pace and depth of curriculum (Plunkett & Kronborg, 2007). These programs are primarily utilised by government secondary schools, although the SEAL Program does vary according to the individual school and the resources and needs of their students. Individuals are predominately placed with 25 highly able students for most core subjects but often join their mainstream peers for physical education, art, or music. Rogers (2002) found in her results of grade telescoping at Victoria’s University High School that ‘the gifted children made great academic gains with grade telescoping, felt slightly better about themselves as learners, and did not lose out socially’ (pp. 186; Plunkett and Kronborg, 2007, 81). This program realistically uses a combination of acceleration and differentiated curriculum.

The International Baccalaureate (IB) Program is a ‘rigorous pre-university course of study, leading to examinations, that meets the needs of highly motivated and academically gifted secondary school students’ (International Baccalaureate North America, 1986, p.1; Hertberg-Davis & Callahan, 2008, p. 32). This program draws students from above the 90th percentile (Davis, Rimm, and Siegle, 2011). As Rogers (2002) states, suitable students to participate in the IB Program include ‘highly motivated, capable and independent learners who are perceptive, reflective, able to make ready associations and who retain information easily’ (NSW Department of Education and Training, 2004, p. 22). Follow up research on students who complete the IB Program reflect on their enjoyment in the course because of the high level of challenge offered, something that they have craved but never found in their earlier years of education (Hertberg-Davis & Callahan, 2008). It is unfortunate that so many students have to wait until this late stage in their school lives to find the educational stimulation they crave.

In Australia there are different types of acceleration occurring. Unfortunately this varies from state to state and school to school. Despite the recommendation within the Commonwealth of Australia Senate Committee Report (2001) to develop a consistent policy which encourages acceleration for suitable candidates, many states have not followed up on this suggestion. In 2007, The Department of Education of Victoria did not have a formal policy on gifted education, let alone a policy on acceleration, although they did outline information about schooling options of which acceleration is included (Plunkett & Kronborg, 2007). Also many of these forms of acceleration only occur within secondary schools, namely telescoping and the IB Program for years 11 and 12. The others rarely occur at primary school level due to
school policies on acceleration or teachers inaccurate acknowledgement of gifted and talented characteristics of children, thus making options limited or non-existent to these younger students.

So important questions remain: when and how do we accelerate? Brody and Stanley (1991) found that the best grades to be skipped are one just before middle or high school (Davis, Rimm, and Siegle, 2011). As our Australian school system is different from America this would translate to either years 5, 6 or 7. Because most students change schools after grade 6 there is less social impact on the child as they must encounter new friendship groups anyhow. Winebrenner (2001) personally believes that ‘grade-skipping should be completed by the end of 3rd grade and not used again until the student is in high school’ (p. 192). Similarly, she believes that by the time students enter 4th grade, social and peer considerations are more important than academics and thus grade-skipping would be counterproductive. But it must be remembered that if a child is so bored, unhappy or underachieving within the current school situation all possibilities must be considered which may include some form of acceleration.

Within a recent gifted education lecture in the Faculty of Education at Monash University, Clayton Campus, a mother of a gifted 15 year old attending Melbourne University beginning a Bachelor of Science, described the educational journey of her son. This child attended an Independent School in Melbourne. He was accelerated after grade 1 to 3 and combined this skipped grade with further enrichment such as learning musical instruments, and French. In grade 4 the boy’s teacher was unsupportive so he studied part-time, working on year 9 mathematics at home, with a tutor and attending the Young Australian National Academy of Music (ANAM) for piano, viola and music theory. By grade 5 he remained part-time at school, introduced a new instrument, the harpsichord and began Indonesian. Still part-time in grade 6 he completed year 11 chemistry in senior school, continued music at the ANAM and Indonesian, and was the Australian under 10 Chess Champion, attending the World Youth Chess championships. Within the following four years, at the age of 14, this boy completed his Victorian Certificate of Education (VCE) and continued his other interests of music, Indonesian and chess. Although the mother described some difficult times emotionally for her son, he now has a small group of friends at Melbourne University, within the chess club and the music groups, and seems to be a generally happy teenage boy (Monash University, Clayton Campus, lecture notes from EDF 6607, Gifted Education: Identification and Programming, 19th April 2011). This student successfully used a combination of acceleration, enrichment and curriculum differentiation to meet his academic needs.

“Paul”, a past student, in a recent discussion described his educational pathway. As his year 11 general mathematics teacher, Paul entered this class as a 14 year old student. Unaware of his skipped grade history, Paul mentioned that in primary school he was so advanced in spelling that he encountered subject acceleration, moving from prep to year 3 for these
classes. By the completion of year 8 Paul skipped year 9 and moved into year 10 and also began some VCE subjects. Whilst completing year 12 Paul also began 1st year physics and mathematics at Melbourne University, although both courses were attended as an off-campus student at other schools. Paul went to Melbourne University and completed a Diploma in science and studied Japanese on the side. He majored in Applied Mathematics and Experimental Physics with First Class Honours. Paul went on to complete his PhD in Physics on ‘Experimental Phase Retrieval using Coherent X-Ray Diffraction’ and is now the leading scientist at one of Germany’s superior science laboratories. Paul’s education also consisted of a combination of different forms of acceleration to meet his academic needs, with no effect on his social and emotional development (Appendix 1).

Gross (1986) talks about a profoundly gifted boy called Terry Tao who by the age of 3½ started school as it was believed he was ready. Although academically gifted, he unfortunately was not ready socially and emotionally to begin school so was withdrawn until the age of 5. When he finally started school Terry spent most of his time in grade 2 and did his mathematics studies in grade 5. By 6½ he fluctuated between grades 3, 4, 6, and 7, depending on the subject. His educational journey continued with radical acceleration whereby by the age of 15 he had gained his Bachelor of Science Degree. Terry’s acceleration was well planned and supported by programming options that included relevant enrichment, ability grouping and mentoring. He had a supportive and encouraging family who always ensured he was involved in all aspects of decision making. So although initially there were hiccups involving early readiness for school entry, because Terry had support from parents, teachers, and peers, the flexible educational program was successful in catering for his academic, social and emotional needs.

Although only three experiences on the educational journeys of gifted students within Australia, these stories are replicated continuously by other accelerated students (Gross’s, 1986, 1993). As long as students demonstrate ‘social readiness, emotional maturity, and motivation for acceleration’ by using a tool such as The Iowa Acceleration Scale (Assouline et al., 2003; Assouline et al., 2009) then there is no reason to prevent these students from being accelerated (Neihart, 2007, p. 336). As Gross (1997) suggests both ‘ability grouping and acceleration are underutilised within Australia, due to a genuine lack of awareness of the research support for these two strategies among teachers and administrators’ (Kronborg & Plunkett, 2008). Observing the educational pathways required by these students, and from almost 20 years as an educator, this lack of awareness is a problem that needs to be addressed within this country.

So what happens to those gifted and talented students who do not fit the criteria for some of the discussed acceleration options yet require more stimulation to prevent boredom or underachievement? Or for those students who require more than acceleration. As is recognised in the NSW Department of Education and Training Support package on acceleration (2004) ‘acceleration should not be adopted in isolation, but should be a
component in a strategy of curricular flexibility' (p. 6; Benbow, 1998). It should be combined with other ‘accelerative options, enrichment options, and out-of-school opportunities that reflect the best possible alternative for educating the specific child’ (NSW Department of Education and Training, 2004, p. 9; Benbow, 1998, p. 282). Many researchers believe that both acceleration and enrichment are complementary components in planning individualised programs for gifted students (Schiever & Maker, 2003).

Enrichment is a term used to describe types of curriculum as well as the manner in which it is delivered. This educational option is recognised as the most common method of providing for gifted students within regular classrooms across Australia (Braggett, 1994). Schiever & Maker (2003) outline that ‘the goal of an enrichment program is to offer students curriculum that is greater in depth or breadth than that generally provided; that is, to challenge and offer growth in the area of the student’s giftedness’ (p. 164). Within Australia the types of enrichment options are very limited compared to America with the most common forms being part-time pullout programs, ability grouping, Saturday and after-school programs and academic competitions. Independent schools tend to offer a more varied curriculum that caters for the gifted and talented students, helping to enrich their educational opportunities. Some schools also use differentiated curriculum, perhaps by utilising Individualized Education Plans (IEPs), which assists to devise a program that caters for gifted students’ specific talents and needs.

One of the most popular forms of enrichment utilised by Australian schools would be the pullout program which is viewed by experts in the field of educating gifted and talented children ‘as a poor solution to the full-time problem of being gifted’ (Davis, Rimm, and Siegle, 2011, 152). Unfortunately the pullout program is a model of enrichment rejected by many Australian teachers as they believe it to be too elitist (Braggett, 1994). On a more positive note, this program does bring gifted students together to discuss more enriched curriculum content with like-minded peers. As long as the sessions are well-structured, challenging, and integrated with the class curriculum the students can benefit both socially and intellectually (Davis, Rimm, and Siegle, 2011). It is also important that enrichment experiences such as the pullout program address the ‘specific talents and interests’ and cannot be general in nature (Feldhusen & Jarwan, 2000, p. 271). Kulik (1992) reported that talented students in enriched classes do ‘outperform initially equivalent students from conventional classes by 4 to 5 months on grade equivalent scales’ (p. v; Schiever & Maker, 2003). So if pullout programs can enhance the academic, social and emotional needs of gifted children then this program has its value in enriching these students.

More so in secondary education, ability grouping is sometimes utilised to provide for those students who require enrichment. There is extensive evidence to support the academic benefits when high ability students are grouped together (Neihart, 2007). A study of nine Australian high schools which changed from ability-grouped to mixed-ability classes for science discovered that the quality of learning declined because the high ability students
had limited opportunities to use their higher order thinking skills and also experienced more
class disruptions from uninterested lower ability students (Rogers, 1993; Bailey, 2005).
Rogers (1993) concluded that ability grouping thus allowed these like-minded students to
learn at the pace and complexity necessary for continual progress in their achievement and
to retain a positive attitude within the subject (Bailey, 2005). Rogers (2002) states that ‘for
gifted students to make substantial gains in learning they need to spend the majority of
time in key academic areas with others of similar ability’ (NSW Department of Education
and Training, 2004, 14). She also mentions that when students are grouped together full-
time their progress increases by an extra third of a year. Other research also indicates that
ability grouping for high ability students benefits their social and emotional needs (Kronborg
& Plunkett, 2008; Neihart, 2007).

Unfortunately in Australia enrichment for the gifted and talented students is often
resourced from outside the classroom and often even beyond the realms of the school
parameters. Although most teachers endeavour to do the best for all children they teach,
the majority have no specialised training in educating gifted and talented children, and thus
fail to meet their individual needs (Davis, Rimm, and Siegle, 2011; Diezmann, Watters & Fox,
2001). Therefore enrichment can be sought from clubs such as chess and debating;
participation in competitions such as the University of New South Wales Award for
mathematics, computers, english and science, the Australian Mathematics Award,
Tournament of the Minds or Future Problem Solving; leadership opportunities such as
Student Representative Council (SRC); or participation in choir, instrumental music or sport
(Government of South Australia: Department of Education and Children’s Services, 2010;
NSW Department of Education and Training, 2004). But these opportunities are usually only
available if the school is independent, has an interested teacher, or a specialist in gifted and
talented. Therefore, it is often up to the parents to resource other avenues such as classes
designed for gifted children which include G.A.T.E.WAYS and Peninsula Connections in

What must be considered when attempting to provide enrichment for gifted and talented
students is that ‘extension does not simply mean additional work; it implies appropriate
work’ (Braggett, 1994, p. 59). Thus, no matter what form of enrichment is utilised it is
important that ‘the curricular level for gifted learners must be adapted to their needs for
advancement, depth, and complexity’ (VanTassel-Baska & Stambaugh, 2006, 79; VanTassel-
Baska, 2003b). It is also important to consider all variables including the health of the child,
gender, social and emotional maturity, family values, intelligence quotient (IQ),
asynchronous development, the receiving teachers attitude, and openness and flexibility to
all options by all concerned parties (Davis, Rimm, and Siegle, 2011).

Even if a school does not offer acceleration or many forms of enrichment, extension can still
be provided in the classroom through differentiated curriculum. This is ‘a process of creating
multiple, “differentiated” learning opportunities within a high-quality curriculum, to
maximize the probability that all students will become engaged in learning, experience efficiency of learning, and experience cognitive growth’ (Davis, Rimm, and Siegle, 2011, p. 155; Tomlinson & Jarvis, 2009, p. 602). Effective teachers can differentiate the curriculum simply by the way they teach, such as the questioning techniques or their instructional approaches (Piirto, 2007). There are so many forms of differentiated curriculum seen through curriculum models such as the School-wide Enrichment Model, and the Autonomous Learner Model (Davis, Rimm, and Siegle, 2011). If successfully administered students of all abilities can work within the same class and to their individual level. Because most gifted and talented primary school age students are taught in the classroom, ‘differentiating the learning experiences for these students may be the only way to meet their needs’ (Sousa, 2009, p. 45).

Although an option for catering for gifted and talented students, realistically to provide the greatest opportunities curriculum differentiation should be combined with acceleration and enrichment. Kulik (2003) concluded on these exact findings after his large-scale meta-analysis on grouping and tracking. In an Independent school in inner city Melbourne, Victoria, an Extended Curriculum Program (ECP) was devised utilising a combination of curriculum differentiation, acceleration, and ability grouping (Kronborg & Plunkett, 2008). This complex and well structured system utilised a variety of methods to cater for the learning needs of high ability students.

Therefore how do we best accommodate the educational needs of our gifted and talented students? It is obvious from the research that ‘some students will be served best by enrichment, some by acceleration, and some by a mix of the two’ (Colangelo et al., 2010, p. 182). It is also important that the teacher provides a differentiated curriculum no matter what methods are used to enhance the students learning (Rogers, 2002; NSW Department of Education and Training, 2004). Our ‘educational systems and educators need to be flexible, acknowledge the existing research, and respond to individual children’ (Diezmann, Watters & Fox, 2001, p. 15).

How effectively are Australian schools providing for the needs of gifted and talented students? Unfortunately with the inconsistent policies of catering for gifted and talented students between the states, there is no uniformity with educating these students within Australia. Despite the Commonwealth of Australia Senate Committee Report (2001) outlining various recommendations for educating these students, very little has been accomplished. Teacher professional development is sparse therefore recognition and the ability to differentiate curriculum of gifted and talented students continues to be a problem. This is more evident in primary school education whereby limited acceleration or enrichment opportunities are available, and thus alternative schools are sought, namely Independent, to endeavour to meet the needs of these children. Although the research is clear that these students need to be accelerated, enriched, or a combination of both methods, depending on the individual students needs, teacher and school opinions of these
options predominantly remains unchanged. Unfortunately most teachers are uniformed of these needs and thus teacher education is a vital aspect to improving the current situation within Australia for these gifted and talented students.

References


Appendix

Discussion with “Paul” on 31st March 2011 at 9pm (EST) by telephone

1. How did the teachers in your primary years cater for your needs?
   I was accelerated for spelling from prep to year 3. Some teachers allowed me to be more creative but it varied from year to year.

2. Did you ever get IQ test? If so, what was your score?
   No

3. How did you feel in your primary years in regards to work and school in general?
   I moved schools a lot because my dad was engaged in engineering projects in different places. I went to Singleton heights in N.S.W., St. Joesph’s, Newcastle, St. Bridgit’s, Newcastle, St. Francis Xavier, Frankston, Victoria. School was always too easy which is why they allowed me to do spelling with higher year levels. I also was given reading projects.

4. Was it suggested by your parents, teachers, or someone else to accelerate after year 8?
   It was suggested by my teachers and my parents were concerned about the skip and how it would affect me.

5. Did your parents realise you were clever?
   Yes, but they were concerned about how I would cope socially.

6. How did you cope socially? Was it difficult having others who were able to drive in VCE and you couldn’t?
   I was nerdy but I still had friends and it wasn’t a problem.

7. Were you accelerated in just math or the whole year level?
   I skipped year 9 completely and went on to do VCE subjects early. I was accelerated in mathematics and psychology. I completed 1st year mathematics for Melbourne University at Padua College and 1st year physics at Haileybury College every 2nd Friday when in year 12. I sat my exams at Monash University.

8. How were you graded in math in year 7 and 8, ie. Was it streamed?
   I can’t recall.

9. Tell me about your journey through University. How long should the course have taken? Did you finish earlier? What about your PhD?
I went to Melbourne University to complete a 3 year Diploma in science but it took 4 years as I took on extra studies. I also did Japanese on the side for 1 ½ years. I majored in applied maths and experimental physics. I went on to complete Honours in physics and mathematics for 1 year and had an 8 hour exam at the end of it. I obtained first class honours. I received a scholarship to do my PhD which took 4 ½ years in physics looking at the 'Experimental phase Retrieval using Coherent X-Ray Diffraction. After Uni I landed a Research Fellow at Micro-analytical Research Group, School of Physics at the University of Melbourne for 1 year. I was then given a Postdoctoral Research Fellow in the Coherent Imaging Group, Department of Physics & Astronomy at the University of California, Los Angeles where I stayed for just over a year. I moved to Germany where I was given a Postdoctoral Research Fellow in X-Ray Crystallography and Imaging Group for the Hamburger Synchrotronstrahlungslabor (HASYLAB) at Deutsches Elektronen-Synchrotron (DESY). I was in that position for 3 years. I have recently been appointed the Leading scientist and Group Head in Single particles, Clusters and Bio-molecules (SPB) imaging instrument at the European XFEL, Albert-Einstein-Ring.

10. When did you decide you wanted to get a PhD in physics and go into the area you’ve gone?
When I was little I would always read science books. Since year 7 I wanted to do physics. My eventual path was an accident and just circumstances at University lead me into this direction. In my area there are only 3 sites in the world, one of which is Japan which may no longer be there as we are waiting from communication after the earthquake. The others are here in Hamburg and Stanford.