Appropriate curriculum

for academically accelerated students:

listening to the case studies of gifted students.

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I hereby declare that the work herein, now submitted as a thesis for the degree of Doctor of Teaching of the Northern Territory University, is the result of my own investigations, and all references to ideas and work of other researchers have been specifically acknowledged. I hereby certify that the work embodied in this thesis has not already been accepted in substance for any degree, and is not being currently submitted in candidature for any other degree.

Peter Merrotsy

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28th March, 2002
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To maintain confidentiality, I am unable to name the people who form the case studies. My debt to them is obvious, and I wish to sincerely thank each of them. I hope that their voices will be heard by those who are able to initiate much needed reform in the curriculum for gifted students.

I wish to publicly express my appreciation to Ms. Stephanie Newman, who, at propitious moments, said, “Hurry up and get the bloody thing finished.”

For the past four years, my daughter Alinta has sat quietly and patiently on my knee, and has watched and read and commented and questioned and waited. To you, Alinta, I dedicate this work, this thesis, this book.
Abstract

This study explores ways of providing a better curriculum for gifted students. A review of the literature emphasises that gifted students require the provision of a qualitatively differentiated curriculum, and finds unequivocal support for the benefits of academic acceleration. An appraisal of curriculum in NSW notes that there are fine programmes for gifted students, but that a lot more can be done.

By listening carefully to the voices of gifted students, effective ways to improve their curriculum may be discovered. Following a life history model which employs the narrative, cases are made from the naturalistic portrayal of eight gifted individuals. Each case study outlines the formative background and educational experiences of the individual, and concludes with a summary of the issues which the individual believes to be most important for improving the curriculum for gifted students.

An interpretive analysis of the case studies makes twenty recommendations. These include: greater flexibility of school organisation; better communication; continuity in a broader, more inclusive curriculum; options of academic acceleration, including access to tertiary level courses; appropriate educational support; and financial support for gifted students from low socio-economic backgrounds, and from rural and isolated settings.

A model for academic acceleration is presented. It recommends six steps towards a better curriculum for gifted students: identification; communication; a negotiated curriculum; academic acceleration; access to tertiary courses while still at school; and support for gifted students.
Prolegomena

This preface is written last, but it is placed at the front of the thesis because of the predilection of academics to read manuscripts from the references forward.

I start by noting an idiosyncrasy. I incorrectly use the inclusive, non-specific terms "they" and "their" to mean "he or she" and "his or hers" respectively, similar to the word Sie in German.

The name "The High School" is used for the high school which the participants of this study have attended. The name "Our Town" is used for the village in which the school is situated. It is my belief that the town and school are much like so many other towns and schools in Australia, and that the individuals in the case studies are very much like gifted people everywhere.

This thesis has slowly taken shape over a period of four years, and has benefited greatly from the excellent structure of the Doctor of Teaching course at Northern Territory University. Flexibility of time and course sequence allowed me to carry out the research while working at a full time job and enjoying the company of my family.

Fragments of the final manuscript were written to satisfy course requirements. Firstly, my essay for EDT621 Graduate Option 2 is recognisable in The Review of the Literature. Then, The Context: The education of gifted students in NSW began life as my essay for EDT620 Graduate Option 1. Again, a pilot study for EDT622 Graduate Option 3 grew up to be the case study Elise. Finally, ideas for Methodology derive from my work for EDT664 Developing the Research Proposal.

The Doctor of Teaching requires a Practical Thesis and a Theoretical Thesis, and these two components are presented here as a comprehensive body of work. The
Theoretical Thesis analyses aspects of the field related to the study, and supports the Practical Thesis which, itself, is made up of two parts.

Firstly, a major part of the Practical Thesis comprises case studies of eight gifted people. These case studies are not intended to be simply a self-serving indication of some of the practical work that I have done with gifted students over the past decade or so. Rather, they exemplify a model for curriculum development, and a paradigm for teaching and learning, which are inclusive of gifted students, and which, thereby, carefully attend to the needs of a significant group of students who, in my opinion, are least served by the traditional curriculum.

Secondly, a model for academic acceleration is presented. The model has been developed, implemented and refined at a public high school in NSW, and I believe that it has system wide implications and application potential. The case studies also show how this curriculum model evolved, and relate the nature of the programmes which were initiated in its implementation. These programmes include courses in philosophy and heuristics, autonomous learning, individual tutoring, mentor programmes, work experience in a research laboratory, provision of academic acceleration options, access to tertiary level courses while still at school, and financial support for students in need. The stories of some of the case studies give an indication of the enormous benefits the model may have for the intellectual, social and emotional well-being of gifted students.
Aims of the Study

“If we take eternity to mean not infinite temporal duration but timelessness, then eternal life belongs to those who live in the present. Our life has no end in just the way in which our visual field has no limits.”

(L. Wittgenstein, *Tractatus Logico-Philosophicus*, 6.4311.)
Aims of the Study

My contention is that, in their traditional schooling and curriculum, gifted students are not well catered for. The current curriculum does go some way towards addressing their particular needs. However, after my experiences of working closely with individual students, I believe that the current curriculum clearly falls short of meeting the needs of many gifted students and often matches neither their academic ability nor their area of interest or expertise.

Generally, gifted students have not received sufficient stimulation to achieve their potential. In particular, students who have accelerated at least some of their secondary school studies find a lacuna of opportunity both in their middle high school years and when final year subjects have been completed ahead of a student's cohort. That is, these students encounter difficulties maintaining continuity in their educational experiences.

Therefore, in order to attain educational equity for gifted students, it is imperative that a curriculum, appropriate to the educational needs of gifted students, be developed and made available to them. The most effective way to do this, I would claim, is to make the curriculum inclusive, which implies, *inter alia*, that gifted students should be involved in decision making processes concerning their curriculum. Indeed, if we attend to gifted students, if we carefully listen to and acknowledge their stories, which relate their suffering and their achievements, their despair and their ecstasy, then, I believe, we are morally compelled to discover ways of improving their curriculum, which includes developing models of academic acceleration.
Therefore, the general aims of this study are:

1. to listen to the case studies of gifted students;

2. to improve the curriculum for gifted students; and

In order to address these general aims, the specific aims of this study are:

1. to conduct a series of case studies and to analyse the results with respect to appropriate curriculum for gifted students, including
   
   (a) school organisation,
   
   (b) academic acceleration,
   
   (c) accessing high-level conceptually demanding courses,
   
   (d) accessing tertiary level courses while still at school,
   
   (e) specific needs of gifted students;

2. to make recommendations to improve the curriculum for gifted students, based on the experiences of the subjects of the case studies and on the outcomes of their educational and personal experiences;

3. to develop and to present a model for academic acceleration, a formal component of which includes gaining access to tertiary level courses while still at school.
“The idols imposed by words on the understanding are of two kinds. They are either names of things which do not exist (for as there are things left unnamed through lack of observation, so likewise are there names which result from fantastic suppositions and to which nothing in reality corresponds), or they are names of things which exist, but yet confused and ill-defined, and hastily and irregularly derived from realities.”

(Francis Bacon, *Novum Organum*, 1620.)
Galimatias

This study is not concerned with “gifted education”. Such phrases are all too often, I believe, oxymorons.

However, this study is concerned with the education of gifted children. Therefore, for educational purposes (cf. Borland, 1989, pp. 32f.), I use the terms “gifted students” and “the education of gifted students”, except when quoting other sources.

For my understanding of giftedness in this study, I accept Braggett’s twin premises of “superior intellect and its correlate, high academic ability” (Braggett, 1985, p. 28).

“Gifted”

My use of the term “gifted” is intended both to simplify and to clarify the concept. In the literature, there is a plethora of terms which are used to refer to gifted individuals. Equally, there are many competing definitions of giftedness. Each term or each definition is accompanied by political baggage, and has implications for pedagogy. The galimatias which arises only results, I believe, in a disservice to gifted students, because the ensuing confusions distract attention, and shift support, from those who are most in need.

The literature refers to “genius” and “prodigy”, and to “gifted”, “talented”, “gifted and talented”, “intellectually talented”, “multitalented”, “precocious”, “promising”, “potentially gifted”, “high IQ”, “highly intelligent”, “able”, “high ability”, “exceptionally able”, “extraordinary”, “creative”, or “expert” child or student or learner.
“Precocious”, in reference to a person who is “prematurely developed in some faculty or proclivity” (Onions, 1978), would be an excellent term, were it not for the pejorative sense which it has in Australia (cf. Gross, 1993, Chapter 1).

I particularly like the adjectives “salient” and “saltatorial”. They hint at the way in which the thinking of gifted students is characterised by dancing in leaps and bounds so that they stand out so markedly from their peers.

Excursus: Conceptions of giftedness

Giftedness is rare (Detterman, 1993, p. 22; Sternberg, 1993, pp. 6ff.).

Before presenting my own understanding of the extraordinary phenomenon of giftedness, the evolution of its antecedents is briefly examined. These conceptions of giftedness begin with intelligence, and move to psychosocial definitions, before witnessing the rise, on the one hand, of talent development, and a return, on the other hand, to a broader understanding of intelligence.

IQ and giftedness

In 1925, Terman defined intelligence to be the ability to acquire and manipulate concepts. He considered gifted children to be those whose measured IQ is above 140 on the Stanford-Binet Intelligence Scale of general intellectual ability, which reflected a high capacity for abstract, symbolic thought (Terman, 1975). At the same time, Hollingworth (1926) recognised levels of giftedness. In her case studies of children, each of whose measured IQ on the Stanford-Binet Intelligence Scale was above 180, she found that early talking and reading most clearly differentiated these children from the average (Hollingworth, 1942).
A psychosocial understanding of giftedness

A generation later, the first psychosocial understandings of giftedness were proposed. DeHaan and Havighurst (1961, pp. 15-36), for example, broadly considered a child to be gifted if the child "is superior in some ability that can make (them) an outstanding contributor to the welfare of, and quality of living in, society". They, too, saw levels of giftedness, and emphasised the importance of a qualitatively differentiated response to the educational needs of the gifted child.

The Javits definition

This more liberal viewpoint was also taken up by the extremely influential Marland Report (U.S. Department of Health, Education and Welfare, 1972), which, essentially, is enshrined in U.S. federal policy in what is now known as the Javits programme.

Children and youth with outstanding talent perform or show the potential to perform at remarkably high levels of accomplishment when compared with others of their age, experience or environment. These children and youth exhibit high performance capability in intellectual, creative and/or artistic areas, possess an unusual leadership capacity or excel in specific academic fields. They require services or activities not ordinarily provided by the school. Outstanding talents are present in children and youth from all cultural groups across all economic strata, and in all areas of human endeavour (U.S. Department of Education, 1993).

The reference to experience is significant, and it is worth emphasising that gifted students have educational requirements not normally provided by the school.

The Marland notion of giftedness is reflected in the work of Gardner, who has had an impact on a significant number of Australian educators by way of his theory of multiple intelligences (Gardner, 1982; Ramos-Ford & Gardner, 1997).
Renzulli’s “three-ring” model

Rather than labelling children as gifted, Renzulli (Renzulli & Reis, 1997a, p. 140) considers gifted behaviours, modelled on the behaviour and productivity of gifted adults, which he develops in his “three-ring” model of giftedness. This model sees giftedness as a necessary interaction and interlocking of three basic clusters of traits: (1) above average, but not necessarily superior, general ability; (2) high levels of a motivational construct called task commitment; and (3) creativity (Renzulli, 1977; Renzulli, 1986; Reis & Renzulli, 1986). Predicated on Renzulli’s definition is an “enrichment triad” educational model, with a “revolving door identification scheme”, promoted as “The School Enrichment Model” (Renzulli & Reis, 1997b), and supported by a vast array of service delivery components (Reis & Renzulli, 1986; Renzulli & Reis, 1997a, p. 149). Renzulli’s ideas have had an enormous impact on the education of gifted students worldwide. Negative critiques of Renzulli’s models have been outlined by Borland (1989, pp. 13ff.) and reviewed briefly by Gross (1993, pp. 34f. and 271ff.; vide The Review of the Literature, pp. 13f.).

Tannenbaum: potential and performance

The important distinction between performance at a high level, and potential to perform at a high level, is made by Tannenbaum (1983; 1997) in his psychosocial definition of giftedness. He proposes that giftedness in children denotes “their potential for becoming critically acclaimed performers or exemplary producers of ideas in spheres of activity that enhance the moral, physical, emotional, social, intellectual, or aesthetic life of humanity” (Tannenbaum, 1983, p. 86; 1997, p. 27). A filigree of five factors mesh into excellence to account for gifted achievement:
general ability; special aptitude; nonintellective requisites; environmental supports; and chance (Tannenbaum, 1983, pp. 86-89; 1997, pp. 29-39).

Gagné’s differentiated model

In a short paper which has had a huge impact on understandings of giftedness, Gagné (1985) distinguishes between natural abilities or aptitudes, and developed abilities or skills. “Giftedness corresponds to competence that is distinctly above average in one or more domains of human aptitude. Talent corresponds to performance that is distinctly above average in one or more fields of human activity.” (Gagné, 1985, p. 108; cf. Renzulli, 1978) This dichotomy allows for an expanded model of giftedness and talent which facilitates its translation from theory into practice. For Gagné, gifts, which are subdivided into the four domains of intellectual, creative, socioaffective, and sensorimotor aptitudes, are developed into the fields of academic, technical, artistic, interpersonal, and athletic talents, through interaction with intrapersonal and environmental catalysts (Gagné, 1991, pp. 66-68).

Borland: special-educational needs

An operational definition of giftedness is proposed by Borland. I find it to be very helpful, because it derives from a rationale of special education.

For the purposes of education, gifted children are those students in a given school or school district who are exceptional by virtue of markedly greater than average potential or ability in some area of human activity generally considered to be the province of the educational system and whose exceptionality engenders special-educational needs that are not being met adequately by the regular core curriculum (Borland, 1989, pp. 32f.).

Sternberg’s triarchic and pentagonal theories

Sternberg (1985) proposes a more rigorous, cognitive conception of giftedness which returns us to the notion of high intelligence. His triarchic theory of human abilities has three subtheories, which are analytic, synthetic, and practical in nature. Here, for
Sternberg, intelligence is contextual, or, how intelligence relates to the external world. Intelligence is two-faceted, or, how experience is related to the way in which the mind deals with novelty and the extent to which the mind is able to automatize information processing. And intelligence is componential, or, the mental process by which intelligent performance is effected, and which in itself concerns: knowledge acquisition through selective encoding, selective combination, and selective comparison; performance through encoding of stimuli, combination or comparison of stimuli, and response; and the metacomponents of planning, directing, and monitoring problem solving. That is, intelligence is a threefold construct which relates to one’s environment, experience, and information processing capabilities. (Sternberg, 1985.) Giftedness is extraordinary intelligence (Sternberg, 1986; 1997).

But, of course, this is not the whole story. Sternberg (1993) also proposes a ‘pentagonal implicit’ theory of giftedness, which stipulated that, in order to be judged as gifted, a person needs to meet five individually necessary and jointly sufficient criteria: excellence; rarity; productivity; demonstrability; and value.

Other cognitive conceptions of giftedness

I must confess that I find cognitive conceptions of giftedness to be the most compelling (cf. Sternberg & Horvath, 1998), and the work of some other cognitive researchers should be briefly mentioned. Hofstadter (1979), who appreciates levels of abstractness of thought, understands intelligence in terms of the ability to syncopate and to generalise. Clark (1997) finds giftedness to be the ability to learn and to think in ways which are qualitatively different from others. Dehaene (1997, p. 162) recognises that “giftedness emerges from an improbable confluence of multiple factors - genetic, chemical, familial, and educational.” Speaking of nature and
nurture, it is worth being reminded of the interesting, and counterintuitive, finding that “heritability of intelligence increases with age” (Plomin, 1997, p. 70).

*Krutetskii: the psychology of mathematical ability*

The exciting research of Krutetskii, first published in Russian in 1963, seems to be little known. Even though he explored the psychology of mathematical ability, his conclusions have profound ramifications for other disciplines as well. Mathematical ability is seen in terms of a student’s ability to formalise, to symbolise, to generalise, to carry out sequential deductive logic, to curtail logic or argument, to reverse logical thinking or find the converse, to be flexible in mathematical methods used, and to conceptualise spatially, and, developed before puberty, the student having a “mathematical mind” (Krutetskii, 1976, pp. 84-88).

Students gifted in mathematics enjoy these abilities in a way which is markedly and qualitatively differentiated from the ability of peers, and which is measurable in their ability to solve problems.

*Talent development*

The current emphasis in the USA is on “talent” and “talent development” (Feldhusen, 1997; 1998; Renzulli, 1994; Ross, 1997, pp. 557f.; U.S. Department of Education, 1993). Gagné (1998, p. 123) suggests that, by diversifying the criteria for excellence, “close to two thirds of students could be labeled gifted or talented in regular classrooms”. This movement in education is excellent general pedagogics. By adopting a broad view of giftedness, schools may develop curriculum which improves education overall and assures “a climate that wedds expectations of excellence to equity of access” (Friedman & Rogers, 1998, p. xviii). However, emphasis on talent development may mean that educational concern and resources
are shifted away from a significant number of exceptional students who have special educational needs.

A proposed conception of giftedness

So, having accepted Braggett's understanding that giftedness is superior intellect and high academic ability, intelligence is taken to mean general cognitive ability, which reflects the well established fact that most reliable measures of cognitive abilities intercorrelate at least moderately. Complex cognitive processes, such as those of Krutetskii's model, are strong indices of general cognitive ability (Carroll, 1993; Mackintosh, 1998; Plomin, 1997; cf. Silverman, 1986).

In proposing my own understanding of giftedness, I recognise that it is exceedingly difficult to correctly identify a significant number of students, especially those who come from a background of disadvantage. It is also needed to be stressed that, in response to identifying a student as gifted, educational action must necessarily follow.

I conceive of giftedness, in an educational sense, in the following way.

A gifted student:

- learns at a rapid pace, and often with alacrity;
- thinks faster, longer, harder, deeper, higher, more broadly, more generally, more abstractly, metacognitively;
- solves problems in a dance-like, expressive and saltatorial manner which is markedly and qualitatively differentiated from the ability of peers;
- is an exceptional student for whom exceptional educational provision is required.
A Review of the Literature

“Genius divine outpaces time, and brooks not the tedium of tardy growth.”

(Ovid.)
A Review of the Literature

Curriculum issues concerning the education of gifted students

This thesis is concerned with appropriate curriculum provisions for students who have enjoyed the benefits of academic acceleration.

Accordingly, this review was carried out by analysing the literature with respect to curriculum for gifted students. This proved to be a formidable task for someone living in a relatively isolated situation, and it was undertaken in several ways. The Internet, including ERIC, was searched, and this process was repeated regularly. The libraries of Southern Cross University, the Universities of Queensland, New South Wales and Sydney, and Northern Territory University were visited. A visit was also made to GERRIC, the Gifted Education Research, Resource and Information Centre, at the University of New South Wales (<www.arts.unsw.edu.au/gerric>). Gifted and Talented conferences (sic) and Gifted Education conferences (sic) were attended. Access to the latest published literature was gained via Amazon (<http://www.amazon.com>).

The literature is vast, and is merely reflected by the rather lengthy list of books, journal articles and audiotapes included in the references attached at the end of this thesis. The literature found to be most formative comprises: George, Cohn and Stanley (1979), *Educating the Gifted: Acceleration and Enrichment*, especially the article by Daurio (1979); Benbow and Stanley (1983), *Academic Precocity. Aspects of Its Development*; Southern and Jones (1991), *The Academic Acceleration of Gifted Children*; and Gross (1993), *Exceptionally Gifted Children*. 14
There is a relative dearth of published research which has arisen from Australian studies. The works of both Braggett (for example, Braggett, 1985, 1992, 1994) and Gross (for example, Gross, 1993, 1995, 1996) are exemplary.

A differentiated curriculum

Gifted students are exceptional students.

Their markedly enhanced capacity to learn (Clark, 1997; Keating, cited in George, Cohn & Stanley, 1979, p. 217), to find, solve, and act on problems (Sternberg, 1985), and to manipulate abstract ideas and make connections (Gallagher, 1997), means that they are usually ill-served by the traditional curriculum in the regular classroom. Indeed, in a very real sense, their giftedness affects their ability to learn to a significant degree (Wilson, 1996, pp. 21-24).

Because they demonstrate pronounced educational needs, gifted students require the provision of a substantially differentiated curriculum which is based on their exceptionality (Baska, 1983, p. 27; Borland, 1989, p. 2, pp. 31f., p. 172; Feldhusen & Baska, 1989, p. 85, p. 99; House, 1987, p. 4; NSW Department of Education, 1989, p. 40; VanTassel-Baska, 1994c, p. 31, p. 54). Furthermore, the higher the intellectual capacity of the student, “the greater is the degree of asynchrony requiring special consideration of exceptional needs” in their education (Clark, 1997, p. 485; cf. pp. 393-409).

Functionally ... the child is dealing with the same kinds of wide discrepancies of ability that plague a learning-disabled child. Like learning disabled children, highly gifted children need support in dealing with the frustration inherent in such a situation. Also like learning-disabled children, highly gifted children need individualized educational programs addressing their various levels of ability (Morelock & Feldman, 1997, p. 446).

A differentiated curriculum for gifted students should be based on need (VanTassel-Baska, 1994b, p.37; Tannenbaum, 1996). Here, the issue is to meet the needs of the
exceptional individual within the context of the needs of a civil and democratic society, which does not gainsay the rights of the individual but does shift the focus on desires and demands (Borland, 1989, p. 32; Sternberg, 1993, p. 9). All children have a right to an education which "will meet their needs, be adapted to their personal characteristics, and help them achieve to the highest possible level of their potential" (Feldhusen & Baska, 1989, p. 85).

The education of gifted children is concerned with translating into educational goals the needs of gifted students (Borland, 1989, p. 171; Feldhusen, 1994d). The current educational needs of gifted students, not their prospects for future eminence, should guide educational practice (Borland, 1989, pp. 3f.). It should be remembered that "gifted students are often in the best position to tell us what they need for their optimal development" (Silverman, 1989, p. 79).

A differentiated curriculum for gifted students may be considered to be an organised set of skills and content that gifted students "can experience or interact with generatively to develop their own knowledge schemas, understandings, and skills" (Feldhusen, 1989, p. 105). It has several requirements. It must be defensible, in the sense of being "educationally right for gifted students" (Borland, 1989, p. 173). There should be a consensus with respect to what gifted students learn that they would not learn in the core curriculum (Borland, 1989, p. 176). There needs to be a scope and sequence, which both Maker (1986) and Borland (1989) call an epistemological structure, "to provide a meaningful organisation for the knowledge and to serve as a basis for designing instruction" (Borland, 1989, p. 177). The need for repetition dramatically decreases, and the need for faster paced instruction increases accordingly (Silverman, 1989, p. 78). There should be opportunities for philosophical discourse, and for the development of personal attitudes and social
skills (Delisle, 1997; Piechowski, 1997; Silverman, 1993). There should be planned articulation with the core curriculum (Borland, 1989, p. 177; 1996). It must provide a “qualitatively” differentiated experience for gifted students (Sheffield, 1999, p. 313), through “a high level of abstraction and pacing of material” (Johnson, 1994, p. 248). If the work is so easy that it can be “accomplished without any guiding attention, the curriculum is not challenging enough to serve the needs of the (gifted) student” (Johnson, 1994, pp. 248f.). A differentiated curriculum needs to be flexible (Benbow & Stanley, 1983, p. 212).

VanTassel-Baska (1994a, p. 13) places credence in planned and well-described written learning experiences for the gifted, yet ... does not seek to devalue the role of the learner or the teacher as each may uniquely interpret and activate those activities through the instructional process.

Models for curriculum development

In the literature, there is a glut of curriculum models designed for use with gifted students (research for this thesis unearthed more than thirty). In a useful book, readily available in Australia from GERRIC, Gross, Sleap & Pretorius (1999, pp. 39ff.) present five of these, and indicate how each may serve as a framework on which to build appropriate programmes and units of work. However, I agree with Wilson (1996, pp. 27f.), who notes that curriculum models are often incorrectly used as programmes, and that, conversely, programmes are often incorrectly considered to be curriculum.

Theoretical curriculum models for gifted students which have been widely applied are: the content mastery model, which emphasises the importance of learning concepts and skills, often at an accelerated rate; the process/product research model which emphasises learning investigatory skills and developing a high-quality
product, often through consultation and independent work; and the epistemological concept model which focuses on an understanding and appreciation of systems of knowledge through an exposure to key concepts, themes and principles (VanTassel-Baska, 1994a, pp. 8-12).

Competition among these models may preclude the development of an appropriate differentiated curriculum for gifted students. Accordingly, VanTassel-Baska (1997, pp. 127-133; cf. Feldhusen, 1994b) sensibly recommends an integrated approach, attending to precocity, intensity and complexity through advanced content knowledge, higher order thinking and processing, and focussing learning experiences around major issues, themes and ideas.

**Programmes for gifted students**

A programme is an integrated and deliberate curriculum response to the assessed needs of students within a school.

A programme for gifted students should be planned and instituted in response to the identified needs of a specific, known group of students whose needs are not being met by existing curricula provisions. Such programmes should articulate with both the core curriculum and the differentiated curriculum for gifted students, and form a strategy for programme development called by Borland (1989, Chapter 3) “a system approach”. This term has a sense close to the well known business meaning of Senge (1992, pp. 12), and emphasises consensus, structure, planning and integration, all of which are required for a curriculum to be present in a programme for gifted students (Borland, 1989, pp. 176f.).

Tannenbaum (1983, p. 423) makes an important distinction between programmes and provisions. Provisions are seen to be fragmentary and *ad hoc* offerings, brief in
duration, without complex form, lacking clear direction, and supplementary to the core curriculum instead of integral with it. A programme, on the other hand, "has well-articulated sequences of goals, skills, and content, constitutes a prescribed part of the course of study of identified gifted students, and is required for all gifted students" (Borland, 1989, p. 43f.; cf. Tannenbaum, 1983, p. 515).

VanTassel-Baska (1994a) identifies five essential elements of a successful programme for gifted students: guidance in selecting courses and direction (cf. Silverman, 1993); content acceleration to the level of the student's abilities (cf. Borland, 1989, pp. 185-188); carefully planned, relevant enrichment (cf. Daurio, 1979, pp. 21-24); special instruction with the opportunity to work closely with other gifted students (cf. Kulik & Kulik, 1997, pp. 240f.); and the opportunity to work with mentors who have a high-level of expertise in an appropriate field (cf. Clasen & Clasen, 1997; Gross, 1993, pp. 196-200).

Programmes for gifted students need to be individualised (Feldhusen, 1989b, p. 108; 1994d, pp. 368f.). By individualisation is meant the organisation of "learning experiences so that the rate, content, schedule, experiences, and depth of exploration" available to a student is predicated on that student's "assessed achievement and interests" (Clark, 1997, pp. 433-437). In several states in the U.S.A., this is mandated by legislation which determines that gifted students are children with special needs who receive an annual Individual Educational Plan (IEP) (Clark, 1997, p. 437; Ross, 1997).

Feldhusen (1989c, p. 239; 1994c) expresses a special concern for the development of the thinking skills of gifted students, due to their capacity for thinking at advanced levels. However, the kinds of programmes often suggested to meet this concern, for example, creative thinking, critical thinking, Bloom's taxonomy, problem solving,
metacognition (Feldhusen, 1989c, pp. 240ff.), are sound general pedagogics and should be available for most students (Daurio, 1979, p. 19). Indeed, they may not necessarily be appropriate for gifted students (Sawyer, 1988; cf. VanTassel-Baska, 1997, pp. 127ff.).

Borland (1989, p. 36) warns that programmes for gifted students “should primarily serve students with very high cognitive and academic potential and ability”, so that they are encouraged to develop their intellectual capacities and affinities. Because Borland champions “general intellectual ability” and “specific academic aptitude” over the other areas of achievement and ability, he argues (Borland, 1989, pp. 36f., pp. 190ff.) that programmes for gifted students ought to be concerned with the nurturing of intellectuals.

A decided need for intellectual challenge (Feldhusen, 1989d, p. 318) does not preclude the teaching of “mere” content. VanTassel-Baska (1989b, pp. 178f.) argues that, in order to satisfy a gifted student’s need for depth, a foundation programme for gifted students should be built within the basic or traditional content domains of knowledge, but notes that this deceptively simple approach of matching aptitudes to curriculum offerings is appropriate but rarely occurs. “Conceptual learning and enrichment in the content areas must be accompanied by appropriate content acceleration allowing for both pacing and depth” (VanTassel-Baska, 1989b, p. 189).

Admittedly, quantity of knowledge, and the way in which this knowledge is organised, are not sufficient for the development of expertise, but they certainly are necessary, either as a cause or a consequence (Simonton, 1998, p. 166; Sternberg & Horvath, 1998, pp. 179ff.). In a spirited and exciting defence of academic rigour, Sawyer (1988) supports the teaching of basic knowledge. Programmes for gifted students should stress content because they are conceived as essential education.
The fact is that a gifted person needs even more knowledge than others before (they) can hope to make a significant contribution to (their) field...

Let's get serious about the academic content of our courses, and subordinate our methodologies and our formal training to the content (Sawyer, 1988, p. 8 and p. 12, author's emphasis; cf. Simonton, 1998, pp. 163-171).

**Ability grouping**

Ability grouping is a contentious issue. Yet nearly every internationally recognised authority on the education and psychology of the gifted recommends that gifted students be grouped together for "a significant proportion of their class time" (Gross, 1993, pp. 209-211; Rogers, 1996a; Rogers & Span, 1993, pp. 590f.).

Kulik and Kulik have employed meta-analysis to review the empirical literature on ability grouping (Kulik & Kulik, 1982, 1984a, 1984b, 1991, 1997). They point out that "meta-analytic studies are currently the only dependable guide to the effects of grouping on children" (Kulik & Kulik, 1997, p. 240). Their meta-analysis is based on the findings of 26 major controlled studies of accelerated instruction, 64 controlled studies on ability grouping, and 25 controlled evaluations of programmes that provided separate classes for gifted students (Kulik & Kulik, 1991). Their findings are clear and unequivocal: students gain somewhat more from grouped classes than from ungrouped ones. The benefits are slight, albeit present, in the area of achievement, with an average increase of one standard deviation on achievement exams. Gifted students accomplished more in special programmes than they did in mixed-ability classrooms (Kulik & Kulik, 1982, p. 422). Moreover, gifted students benefit academically from ability grouping, and these benefits are usually largest in special accelerated and enriched classes (Kulik & Kulik, 1997, p. 240). In enriched classes, academic benefits are moderate but still significant. However, the biggest academic benefit is achieved by acceleration, either by grade advancement, or by
compacting or telescoping a course, that is, by completing four years in three (Kulik & Kulik, 1997, p. 240).

That is, and this does need to be emphasised, gifted students benefit academically from ability grouping which is accompanied by a differentiated curriculum, and the greatest benefit is achieved by acceleration (Kulik & Kulik, 1991, p. 191; 1997, pp. 237ff.).

Grouping models which place gifted students together for all or part of their school day include special schools, selective schools, residential schools, full-time classes, special classes, Opportunity ‘C’ (OC) classes, special seminars, and honours, advanced, or extension classes. These programmes and provisions contrast sharply with “part-time instruction” in the form of pull-out enrichment or Renzulli and Reis resource rooms, which “limit severely the potential delivery of services” to gifted students (Feldhusen, 1994d, p. 367). However, with cries of “elitism” raised against many programmes and provisions for gifted students, especial care must be made that models for both identification and programming are equitable, pragmatic and defensible (Gross, 1993, passim; Richert, 1997, p. 86).

**Cooperative learning**

Slavin (1990) argues against the ability grouping of gifted students, and for meeting the learning needs of gifted students within the regular classroom, through, for example, the use of “cooperative learning”. He does admit that “use of cooperative learning does not require dismantling ability group programs... In a situation where acceleration is appropriate, cooperative learning is likely to be effective if used within the accelerated class” (Slavin, 1990, p. 7). However, Feldhusen (1994d, p.
373) emphasises that small-group learning is most effective for gifted students only “when conducted in groups of intellectual peers”.

Rogers and Span (1993, p. 591) state that mixed-ability cooperative learning “should be used sparingly” for gifted students. Unfortunately, Rogers adds “perhaps only for social skills development programmes” (Rogers, 1991, p. xiii) which fails to recognise “the extent to which the psychosocial development of gifted students differs from that of their age-peers of average ability” (Gross, 1993, p. 210).

Robinson (1997, pp. 243f.) questions the research support for claims that cooperative learning for gifted students has social and academic benefits. Further, she comments (Robinson, 1997, p. 244) that cooperative learning practices are, in fact, likely to be deleterious for gifted students (cf. Colangelo & Davis, 1997, p. 4; Fiedler, Lange & Winebrenner, 1993; Robinson, 1990, Rogers & Span, 1993, p. 590). One reason why cooperative learning is a damaging reform movement is that gifted students “miss opportunities for accelerated or enriched work that matches their abilities” so that attention is diverted from more valid educational needs (Colangelo & Davis, 1997, p. 4). Another reason is that, in practice, gifted students tend to withdraw from the groups, tend towards passivity, or are frustrated by the non-responsive pace (Robinson, 1997, p. 245), and usually “do not prefer cooperative contexts” (Robinson, 1997, p. 251).

**Debate: Enrichment versus Acceleration**

Whilst most teachers and researchers involved with the education of gifted students agree that gifted students require a differentiated curriculum (Gross, 1993, pp. 209-211), there is passionate debate concerning the form which this provision should take (George, Cohn & Stanley, 1979; Southern & Jones, 1991; Colangelo & Davis,
The main interventions used with gifted students are counselling, enrichment, and acceleration (VanTassel-Baska, 1994a, p. 6-8).

Counselling is important for the social and emotional development of the gifted student, and should be part of the framework for any programme devised for gifted students (Clark, 1997, pp. 57-59; Colangelo & Davis, 1997, part V; Friedman & Rogers, 1998; Silverman, 1989; 1993).

An enormous body of literature exists concerning enrichment models of curriculum and enrichment programmes. Reviews of enrichment models may be found in Maker and Nielson (1995), and, as mentioned above, in Gross, Sleap and Pretorius (1999). In a review of research on enrichment, VanTassel-Baska (1994a, p. 7) noticed quite diverse findings for programmes which described themselves as enrichment programmes.

There is a modest but increasing number of journal articles and books, with a solid research foundation, concerned with the academic acceleration of gifted students. After more than two decades, the seminal and extensive review by Daurio (1979) is still very important and demands attention by anyone interested in this issue. Models for academic acceleration are found in Benbow and Stanley (1983), Southern and Jones (1991), Feldhusen, Proctor and Black (1986), and VanTassel-Baska (1994).

There are two excellent Australian reviews of the literature on the academic acceleration of gifted students, and which are readily accessible: an annotated bibliography of current research and practical advice by Hannon (1995), available from GERRIC, and a succinct article by Mackenzie-Sykes (1996), available on the Internet.
Whatever the status of the debate, if service delivery for gifted students is predicated on their needs, then a differentiated curriculum should be challenging and educationally relevant, and should be adapted by acceleration, enrichment, sophistication, and novelty (Gallagher, 1997, p. 18; Keating, cited in George, Cohn & Stanley, 1979, p. 218). Such an eclectic approach to programming for the gifted, as Feldhusen (1983) also wisely advises, will be employed within an integrative framework, adaptable to the cognitive and affective needs of the individual (cf. Gross, 1993, pp. 196-200).

The gifted need opportunities to discover their own talents or academic strengths in accelerated curricula and through intensive experiences at advanced levels in interaction with the key concepts of the disciplines. ... The best models provide accelerated, enriched, and challenging learning experiences that help gifted youth clarify their talent strengths and potential and give them opportunities to move ahead to higher levels and at a pace that fits their abilities (Feldhusen, 1989b, p. 119).

**Enrichment**

Stanley (1979, p. 172) defines *enrichment* to be “any educational procedure beyond the usual ones for the subject or grade or age that does not accelerate or retard the student’s placement in the subject or grade”. Enrichment programmes provide alternatives (Feldhusen, 1989b, p. 106) and are supplementary to the regular curriculum (Feldhusen, 1989a, p. 6). Classically, enrichment is considered to be “horizontal” (Stanley, 1979, p. 174), and is seen to take two forms: lateral, non-accelerative enrichment, which may be described as “irrelevant academic enrichment, and cultural enrichment” (Daurio, 1979, pp. 17-21), and to which Stanley (1979, pp. 172f.) appropriately adds the term “busywork”; and relevant academic enrichment (Daurio, 1979, pp. 21-24).
I believe that it is indeed sad that much of the so-called enrichment of many programmes for gifted students exists “only in the verbalizations of the teachers and administrators who describe such programs” (Sisk, cited in George, Cohn & Stanley, 1979, p. 237). Too many enrichment programmes lack comprehensive planning and organisation, and fail to meet Borland’s (1989, passim) curriculum guidelines as outlined above. Interventions, claimed to be appropriate for gifted students, seem to Daurio (1979, pp. 18f.) to be “better suited as principles of general education, rather than special education”.

The best form of enrichment intervention is relevant academic enrichment (Daurio, 1979), which requires the provision of a programme specifically designed for the individual (Gross, 1993, p. 205). This will naturally entail advanced material and higher level treatment of topics within their area of special aptitude, and “the more relevant and excellent the enrichment, the more it calls for acceleration of subject matter or grade placement later” (Stanley, 1979, pp. 173f.; cf. Daurio, 1979, p. 22). Stanley (1979, p. 172) also warns that it is potentially damaging for the gifted student if this acceleration does not take place. Schiever and Maker (1997) emphasise the complementary nature of enrichment and acceleration. Using a perhaps inappropriate application of René Thom’s catastrophe theory, they develop a “spiral model”, long known to mathematics educators, which focuses on a problem solving approach through process, content and product oriented enrichment programmes.

Individual student-centred approaches, in particular, that of Renzulli, have “dominated gifted education worldwide, especially at the elementary level” (VanTassel-Baska, 1994a, p. 6). Renzulli has developed “The School Enrichment Model” (Renzulli & Reis, 1997a, 1997b), which emphasises the development of gifted behaviours and the labelling of programmes and services rather than students
(Renzulli & Reis, 1986), and which is promoted and supported by a vast array of service delivery components (Reis & Renzulli, 1986; Renzulli & Reis, 1997a, p. 149). The strengths of Renzulli’s approach arise from his concern for a student’s specific content interests and preferred learning style (Renzulli, 1979, p. 88), and from the observation, often overlooked by proponents of the model, that acceleration may well be the most appropriate form of enrichment (Renzulli, 1979, p. 87).

Negative critiques of Renzulli’s “three-ring” conception of giftedness, enrichment triad instruction model, and revolving door identification scheme, have been briefly reviewed by Gross (1993, pp. 34f., 271ff.). She wryly points out that these critiques have been “slow to make their impact on Australian educators”, and schools which base their enrichment and identification strategies on Renzulli’s models are “frequently unaware that Renzulli’s theories are being called seriously into question” (Gross, 1993, p. 207).

Enrichment by itself ... is quite inadequate as an educational response to exceptional intellectual giftedness. However, where enrichment is offered as one component in an educational programme, educators should be aware of the research on inappropriate and appropriate enrichment strategies ... and should ensure that the enrichment provided responds to and extends the child’s academic and intellectual talents (Gross, 1993, p. 271).

**Academic acceleration**

Acceleration is one of the most curious phenomena in the field of education. I can think of no other issue in which there is such a gulf between what research has revealed and what most practitioners believe. The research on acceleration is so uniformly positive, the benefits of appropriate acceleration so unequivocal, that it is difficult to see how an educator could oppose it (Borland, 1989, p. 185).

The classical understanding of acceleration is “progress through an educational program at rates faster or ages younger than conventional” (Pressey, 1949, p. 2).
This is now, more appropriately, referred to as *academic acceleration* (Southern & Jones, 1991).

Grade skipping is but one example of academic acceleration. Most of the range and types of academic acceleration are presented in a clear table by Southern and Jones (1991, pp. 2f.; cf. Mackenzie-Sykes, 1996). These options are early entrance to school, grade skipping, continuous progress, self paced instruction, content or subject acceleration, combined classes, curriculum compacting, telescoping curriculum, mentorships, extracurricular programmes, concurrent enrolment, advanced placement, credit by examination, correspondence courses, and early entrance to university.

Academic acceleration therefore refers to any of the ways by which a gifted student engages in the study of new material that is typically taught at a higher grade level than the one in which the child is currently enrolled, and covers more material in a shorter time (Feldhusen, 1989a, p. 6), and accordingly is seen to be "vertical" provision for gifted students (Stanley, 1979, p. 174).

Implicit is the assumption that gifted students, who are seen to be performing, or reflect the potential to perform, at advanced skill levels, should be studying new material at levels commensurate with their levels of ability (Feldhusen, 1989a, p. 7). Since a common characteristic of gifted students is their ability to learn at a fast rate, acceleration in some form should be an integral part of every gifted programme (Clark, 1997, pp. 205-208; Silverman, 1989, p. 79). Stanley (1979) concludes that academic acceleration is the most fundamental need of a gifted student.

A model for academic acceleration may refer to service delivery, which includes early entrance, grade skipping or partial acceleration, whereby a standard curriculum
experience is offered to a gifted student at a younger age or earlier grade than usual. Or it may refer to curriculum delivery, which involves increasing the pace of presentation of material either in the regular classroom or in special classes (Schiever & Maker, 1997, pp. 115f.). In either case, programmes for academic acceleration allow the examination of content in greater depth, give access to subject matter at levels of greater conceptual difficulty (cf. Wheatley, 1989, p. 265), and should "provide instruction that individually and explicitly fits the achievement levels, ability, interests, and learning style of the gifted student" (Feldhusen, 1989b, p. 106).

Thoughtful and careful guidelines for academically accelerated progression are given by Feldhusen, Proctor and Black (1986) (cf. Mackenzie-Sykes, 1996). They also point out (Feldhusen, Proctor & Black, 1986, p. 27) that, for many schools with limited resources and small numbers of students, "grade advancement" is not just an available option but may be the main or only way by which the curriculum can be adjusted to meet the educational, social and emotional needs of the gifted student.

Despite the preponderance of evidence in favour of academic acceleration, concern about the social and emotional adjustment of accelerated students persists. Many researchers have found that this concern is cited by both teachers and administrators as the primary reason for opposition to academic acceleration (Bailey, 1998; Cornell, Callahan, Bassin & Ramsay, 1991, pp. 74f.; Daurio, 1979, pp. 26f.; Gallagher, 1997, pp. 16f.; Pollins, 1983, pp. 160f.; Rogers, 1996b; Rogers & Kimpston, 1992).

However, each of these researchers is adamant that research finds no evidence to support the notion that social and emotional problems arise through well-run and carefully monitored acceleration programmes. Indeed, Daurio (1979, p. 27; cf. Gross, 1993, pp. 196-200) notes that:
all indications point to the maintenance of professional attitudes of excessive concern over potential socioemotional maladjustment among intellectually precocious young accelerates, and too little concern about the probability of maladjusting effects resulting from inadequate intellectual challenge.

Gross (1993, p. 272) suggests that academic acceleration in fact significantly increases the chances of a gifted student “forming warm and productive social relationships with other students”.

It is noteworthy that Elkind, who, quite sensibly and persuasively, alerted both teachers and parents to the dangers of hastening a child through childhood (Elkind, 1981), accepts that academic acceleration is a valid and appropriate response to a gifted student’s precocious development and educational needs (Elkind, 1988). He places the issue in perspective by correctly noticing that gifted students are “already accelerated” and that what is accelerated in academic acceleration is simply the student’s progress through the formal school curriculum (Elkind, 1988, pp. 23, 27). The key point is that matching the curriculum to the student’s abilities is not acceleration per se, but rather is “developmentally appropriate teaching practice” (Elkind, 1988, p. 27.; cf. Robinson, 1983; Silverman, 1989, p. 79).

Towards an appropriate curriculum for gifted students

Some points from the above discussion are worth emphasising.

The literature is adamant and unequivocal: gifted students are exceptional students, who have three basic educational needs. They require the provision of a curriculum which is substantially and qualitatively differentiated; which is prescribed, planned, articulated, permanent, on-going and defensible; which is based on their exceptionality; and which is predicated on the needs of each student. They require accelerated, enriched, and challenging learning experiences, with carefully planned, relevant enrichment, and with content acceleration to the level of the student’s
abilities. They also require counselling and guidance to foster cognitive and affective growth.

The notion of academic acceleration is evidently contentious, with an enormous hiatus existing between what research has revealed and what most practitioners believe and do. The literature uniformly emphasises that academic acceleration should form an integral component of a school's programme for gifted students, complementing enrichment programmes and provisions, and following relevant enrichment.

Academic enrichment is certainly worthwhile for most students, and should not be offered to gifted students only. Accusations of "elitism" may be therefore justifiably levelled at enrichment programmes, whereas academic acceleration, which provides no special curricula, should be perceived as being more equitable.

No studies have shown that enrichment programmes or provisions give more benefits to gifted students than methods of acceleration. In fact, in their meta-analytic studies, Kulik and Kulik (1997, pp. 237ff.) showed that academically accelerated gifted students significantly outperform students of similar intellectual ability who have not been accelerated.

Resistance to academic acceleration, especially through concerns for the social and emotional development of the accelerated student, is not grounded in research.

Clearly, educators need to be aware of the empirical research on the positive effects of academic acceleration. Academic acceleration is valid pedagogics, is grounded in and supported by research, and is an appropriate response to the educational and social needs of a student whose cognitive ability and academic achievement are several years beyond those of their age-peers. Moreover, the literature carefully
points out that academic acceleration appears to be the best and most feasible method for providing a challenging, rewarding and on-going education which matches a gifted student's academic and intellectual ability and comes closest to meeting their educational, social and emotional needs (Benbow & Lubinski, 1997, p. 165; Daurio, 1979, p. 53; Feldhusen, 1994a, p. 27; Gross, 1993, pp. 271ff.).
The Context:

The education of gifted students in NSW

“Les grandes personnes ne comprennent jamais rien toutes seules, et c’est fatigant, pour les enfants, de toujours leur donner des explications.”

(Antoine de Saint-Exupéry, Le Petit Prince, I.)

(Grown-ups never understand anything by themselves, and it is tiresome for children to always have to explain things to them.)
The Context

The education of gifted students in NSW - an appraisal

This study, which concerns appropriate curriculum for academically accelerated students, is situated within the public education system of NSW. In order, therefore, to set this study within its educational context, I present an appraisal of the NSW Department of Education's current policies and practices in the education of gifted students, and the programmes and provisions available for gifted students attending NSW public schools.

After outlining the way in which education is structured in NSW, it is apropos to begin with Braggett’s outstanding report to the Commonwealth Schools Commission in 1985, and to detail the developments which have occurred specifically in NSW since then. This discussion is reinforced, by way of example, with an examination of the way in which gifted students are dealt with in the subject of Mathematics in this state.

An interesting but broad overview of changes and challenges in policy and attitude is presented by Wilson (1996).

The NSW education system

In NSW, two mutually independent government bodies, both answerable to the state Minister for Education, have responsibility for school education.

The Office of the Board of Studies is responsible for the development of syllabuses, external examinations such as the Higher School Certificate (HSC), and ensuring that all schools follow approved syllabuses.
The NSW Department of Education has, over the past decade or so, also been known variously as the NSW Department of School Education, the NSW Department of School Education and Youth Affairs, the NSW Department of Education and Training, and the NSW Department of Training and Education. It is a state government department, and is responsible for the delivery components of public school education. (Nix, 2002, personal communication.)

In NSW, schooling is divided into six Stages and thirteen school Grades or school Years, Kindergarten to Year Twelve. Stages are generally equivalent to two years of schooling, so, for example, the outcomes of Stage Six are usually attained by a student during Years Eleven and Twelve. The concept of Stage Seven, or post HSC, courses has been introduced, and could be provided through Distinction Courses or through Extension Courses. Students usually progress sequentially through Years K to Twelve, and transition usually takes place at the end of each year. Under special circumstances, a student may skip a grade by progressing from one Year to the next during the course of a school year, or, during transition, from one Year to a Year two or more years ahead.

In most NSW schools, groups of students are “streamed” in school Years. Streaming also refers to the grouping of students within a school Year, usually in ability groups, for example, the placing of students from Years Nine or Ten into Advanced, Intermediate or Standard Mathematics classes. Vertical streaming therefore means to place students from more than one school Year together in classes or ability groups, as, for example, is the case at The High School for Years Eight, Nine and Ten in the Vertical Semester Organisation (VSO).
In the USA, streaming is called tracking. I use tracking to refer to maintaining administrative detail concerning the courses completed by a student, particularly necessary in a VSO or when a student has academically accelerated.

**Braggett’s report, 1985**

In 1985, Braggett reported on the status of education of gifted children in Australia for the Commonwealth Schools Commission (Braggett, 1985). For his understanding of giftedness, he takes the twin premises of “superior intellect and its correlate, high academic ability” (Braggett, 1985, p. 28).

Braggett (1985, p. 5) observed that previously the education of gifted children had been afforded low priority. He noted that it was firmly believed, or hoped, that the needs of outstanding students could and would be catered for within the existing curriculum. Almost total responsibility was placed on the classroom teacher to provide for all levels of ability and talent with a minimum of resources and support.

Gifted students were seen by most people not to be disadvantaged (Braggett, 1985, p. 5), yet Braggett believed that they “are possibly the most disadvantaged group ... for they generally have not received sufficient stimulation to achieve their full potential” (Braggett, 1985, p. 5; cf. p. 259).

Commenting on the general lack of policy, narrow curricula, and poor organisational structure, Braggett (1985, p. 6) suggested the need for flexible forms of school organisation, pointing out that “system organisational patterns generally constitute the most effective barrier to the development of giftedness within Australia” (Braggett, 1985, p. 316).

Braggett concluded his important study:
Because social grouping and the lock-step method of promotion may constitute barriers to the development of outstanding talent, there is an urgent need for systems to develop more flexible organisational patterns to permit student progression based on individual development and performance. More flexible procedures need to be developed, permitting early entry to school in appropriate cases and allowing continuity of experience based on criteria other than age or years of attendance (Braggett, 1985, p. 317, recommendations 4 and 5).

Braggett’s research was reinforced by the Senate Select Committee on the Education of Gifted and Talented Children, which also outlines the policies, practices and attitudes of the 1980s (Commonwealth of Australia, 1988). For many people, the concepts of gifted and of talented were somewhat confused (cf. Gross, 1993, p. 49).

**Developments since 1985**

Since 1985, considerable changes have occurred in attitude towards the education of gifted children in Australia, and in policy for the education of gifted students in NSW.

In 1991, the NSW Board of Studies responded to “Excellence and Equity”, the “Carrick Report”, and the “Education Reform Act 1990 (New South Wales)” with the implementation of progressive curriculum initiatives (NSW Board of Studies, 1991a).

Starting with the premise that *each child has a right to realise their potential*, the aim was to provide all students with a broad, balanced, quality, contemporary curriculum, taking into account the needs of students of differing abilities and backgrounds, whilst seeking to provide for all students an enriching school experience (NSW Board of Studies, 1991a, p. 1). Some students would be able to progress to a range of new high-level courses to be offered beyond current HSC courses (NSW Board of Studies, 1991a, p. 7).
By redefining its course requirements in terms of objectives, content and expected outcomes for students of various ages and levels of ability, and defining outcomes as “the specific, observable indications of learning to be expected of students at the end of a particular stage of a course” (NSW Board of Studies, 1991a, p. 14), student progression through curriculum structures could then be based upon successful achievement of syllabus objectives and experiences. “‘Time’ should be regarded in all schooling as a flexible factor in learning rather than as a determining factor” (NSW Board of Studies, 1991a, p. 13).

With some equivocation, the Board of Studies stated that able students could be provided with extension work within the stage of the syllabus they are undertaking. However, it also made the bold step of allowing, at the discretion of the school, “accelerated progression into the next stage of work” (NSW Board of Studies, 1991a, p. 16), in terms of providing flexible progression “for all students within the context of social growth and peer interaction” (NSW Board of Studies, 1991a, p. 17; cf. p. 18).

Accelerated progression is possible across the years of formal schooling Kindergarten to Year Twelve. Accelerated progression is to be based on attainment of defined outcomes and all-round readiness of the student. The basis of any accelerated progression will be compression rather than omitting sections of work. Accelerated progression in any subject requires students to achieve the outcomes of all stages in that subject (NSW Board of Studies, 1991a, pp. 18f.).

In an important development, the Board of Studies introduced the concept of “Stage Seven courses”. These could be provided in two ways: through Board-developed “Distinction” courses; and by enrolment in a first year university course (NSW Board of Studies, 1991a, pp. 20f.).
State government policy

At the same time, the NSW Government released its policy for the education of gifted and talented students. The terms “gifted” and “talented” were applied to students “with the potential to exhibit superior performance across a range of areas of endeavour” and “in one area of endeavour” respectively (NSW Department of School Education, 1991a, p. 3).

Within the policy document, it is clearly expressed that acceleration is an appropriate response to students who are accelerated learners (NSW Department of School Education, 1991a, p. 14), and admits that acceleration “involves changes in school organisation and in the curriculum” (NSW Department of School Education, 1991a, p. 14). Radical in Australia for its time, there follow ten pages suggesting how academic acceleration may be implemented (NSW Department of School Education, 1991a, pp. 14-23).

In a companion document, outlining the government’s strategy for the education of gifted children, the onus is placed directly on schools to implement various interventions. These include: classroom teaching strategies, flexible progression, vertical grouping, enrichment, specialist classes, mentor programmes, and camps (sic) (NSW Minister for School Education and Youth Affairs, 1991, pp. 6f.). It was anticipated that after 1995, each school would “employ at least one teacher who has training in the education of gifted and talented students” (NSW Minister for School Education and Youth Affairs, 1991, p. 11).
Accelerated progression

Accompanying the policy and strategy documents to schools came a handbook from the NSW Board of Studies setting out the guidelines for accelerated progression (NSW Board of Studies, 1991b, pp. 3-19) and some ideas on organisational changes which would facilitate flexible progression (NSW Board of Studies, 1991b, pp. 25-29). Some reticence is expressed concerning acceleration and affective development (NSW Board of Studies, 1991b, p. 16). Interestingly, the NSW Government policy definition is translated into the “more precise definition” of Gagné’s differentiated model of giftedness and talent (NSW Board of Studies, 1991b, p. 3; cf. Gagné, 1985, p. 108). Gross (1993, p. 40) emphasises that

an education system which adopts the Gagné definition commits itself to identifying high potential in students - real potential, not imagined potential proposed for political reasons! - and creating an educational and social environment which will develop that potential into high performance.

A thorough and well-researched revision of these guidelines was released in 1997. This time, Gagné’s distinction between potential and performance is unambiguously presented (NSW Board of Studies, 1997, p. 7), and an important section, on flexible progression and suggestions for organisational change, is placed more prominently within the document (NSW Board of Studies, 1997, pp. 12-16). Accelerated progression is viewed very positively since it is a readily available educational alternative, and since it “should provide a challenging and satisfying educational environment without disadvantaging the student educationally, emotionally or socially” (NSW Board of Studies, 1997, p. 17). It is emphasised equivocally that acceleration is to be based on the principle of compression or compacting of study and not omission, but that not every outcome need be attained (NSW Board of Studies, 1997, p. 27, p. 35).
The “new” philosophy of an outcomes-approach accepts that students “can be working towards syllabus outcomes anywhere along the learning continuum” (Assessment and Reporting Directorate, 1996, p. 3). Effective and informative reporting acknowledges that students can be demonstrating progress and achievement of syllabus outcomes across stages, whilst helping to identify students for targeted intervention and to inform school improvement programmes (Assessment and Reporting Directorate, 1996, p. 5).

**Distinction courses**

Since 1994, the NSW Board of Studies has provided an exciting and major curriculum initiative for gifted students in the form of Distinction Courses. These courses, in Philosophy, Comparative Literature, and Cosmology, are high-level HSC courses which approximate first year university study, and are designed “to encourage excellence and to provide additional academic opportunities” for gifted students (NSW Board of Studies, 1995, p. 106). Although Distinction Courses are studied externally through distance education mode, residential schools do allow students to “study and socialise with like-minded highly talented students” in a university setting (NSW Board of Studies, 1995, p. 7). Appropriately, to be eligible for consideration to participate in this programme, “students must be accelerants” who have completed HSC units at the highest level (NSW Board of Studies, 1995, p. 8).

It was hoped that Distinction courses would attract recognition from universities (NSW Board of Studies, 1996c, OHT 8m(i) and (ii)), but the response has been somewhat equivocal with only the possible offer of advanced standing or consideration of credit from most institutions in NSW (Harrison, 1997). Following the McGaw Report, “the Government’s HSC White Paper determined that the
Distinction Course Program would be deleted” (Stanley, 2000, personal communication). It is now proposed that gifted students be supported to gain access to a greater range of tertiary courses while still at school (McGaw, 1997, pp. 27f.; Aquilina, 1997, p. 9); however, there is still a lot to be done with respect to curriculum negotiations, delivery, and credit transfer. Such arrangements would “cater for the needs of a greater number of high ability students than is the case with Distinction Courses” (Stanley, 2000, personal communication).

Other programmes and provisions

The NSW Department of Education boasts specialist classes and specialist schools among its programmes and initiatives for the education of gifted students. Currently, there are twenty three selective and agricultural high schools, and one hundred and six primary Opportunity ‘C’ (OC) classes in sixty seven primary schools (NSW Department of Education and Training, 2001).

In what it calls an “exciting” initiative (NSW Department of Education and Training, 2001), the NSW Department of Education has given grants to each school district to support gifted and talented students and their teachers. The grant for the year 2000 was $5000, which was spent by one district on an OC class excursion and staff development at one school. This year, in 2001, the grant was $1600, which in the same district was spent on staff development at one primary school, which covered Bloom’s Taxonomy and Gardner’s Multiple Intelligences. (Brown, 2002, personal communication.)

To date, the needs of disadvantaged gifted students have only been recognised in the policy for Aboriginal education. It is stated that it is a central theme of the policy to promote educational achievements by Aboriginal students (Aboriginal Education
Unit, 1996, p. 1 and p. 2), the goal being to make curriculum, teaching and assessment programmes “challenging and culturally appropriate” (Aboriginal Education Unit, 1996, p. 8 and p. 9). A policy strategy is to expand “opportunities for Gifted and Talented Aboriginal students through developing criteria to identify these students and developing and implementing specific programs designed for them” (Aboriginal Education Unit, 1996, p. 10).

Professional training and development

There is an enormous lacuna in the training of teachers in the education of gifted students. The majority of teacher training bodies have at most an optional and minor component of pre-service course work concerned directly with the education of gifted children, so that most newly qualified teachers receive no such training (Vasilevska, reported in The Sydney Morning Herald, 17/7/2001, p. 4).

I believe that, since 1991, provision for the professional training and development of teachers in the education of gifted children has been, at best, minimal. According to Vasilevska (1998, personal communication), during 1992 and 1993, a total of $300,000 was spent on in-service courses for classroom teachers, and on a special course at Charles Sturt University for Cluster Directors, a position which no longer exists. Many regions produced resource handbooks intended as part of a professional development programme (for example, Funnell et alia, undated). Whilst there is some mention of acceleration (Funnell et alia, undated, Module 6), the emphasis is decidedly on the provision for gifted students within the confines of the regular classroom (Funnell et alia, undated, modules 3 to 5). It is unclear to what extent these initiatives filtered down to classroom teachers.
Following an industrial agreement in 1996, there has been essentially zero funding for professional training and development (Leete, 2001). Professional development and training in the education of gifted students has suffered, for, since 1996, there have been very few (in some regions, not any) in-service courses concerned with this issue. A recent initiative, however, does provide professional training and development for teachers at all selective high schools (Vasilevska, 2001, personal communication).

Courses in the education of gifted children are offered by several tertiary institutions. A programme of studies leading to a Certificate in Gifted Education has been developed by GERRIC within the University of New South Wales, and costs $1,800 (Gross, 1999, personal communication; brochure available from GERRIC; <http://www.arts.unsw.edu.au/gerric>). As part of an Australian Mathematics Teacher Enrichment Project, a course in Enrichment Mathematics leading to the award of the Graduate Certificate in Education has been developed by the Australian Mathematics Trust and the University of Canberra. There is an up-front fee of $600 per unit (Thornton, 1999, personal communication; brochure available from the Australian Mathematics Trust, University of Canberra; <http://www.amt.canberra.edu.au/~sjt/amtep.htm>).

Studies are carried out during vacations and on weekends, costs are met by individual teachers, and the successful completion of a course leads to neither promotion nor increase in salary.

There are national and state conferences concerned with gifted and talented children and the education of gifted students. "The 5th Annual Gifted Education (sic) Conference", for example, cost $495 plus GST plus travel plus accommodation (brochure from IES Conferences Australia). Teaching resources for the education of
gifted students are available, usually promoted by companies with a vested interest in any sales.

There is a quickly growing number of web sites which are concerned with the education of gifted students (for example, TalentEd, <http://scs.une.edu.au/talented/>, and which provide enrichment material for gifted children. Most of the gifted students with whom I work closely do not have regular access to the Internet.

**Mentor Links**

Mentor was an old friend of King Odusseus. When the king set sail for Troy, he entrusted his whole household to Mentor, who became the guide and adviser of Telemachus, the young son of Odusseus (Homer, *Odusseias*, B 224-227). A mentor is an experienced and trusted counsellor who fulfils a similar office (Onions, 1978).

An example of NSW Department of Education policy in action is seen in the Mentor Links Program.

Responding to policy statement two, “School communities have a responsibility to provide a range of opportunities for their gifted and talented students” (NSW Department of School Education, 1991a, p. 7), mentor programmes are suggested as one way of whole-school provision for gifted students (NSW Department of School Education, 1991a, p. 8; NSW Minister for School Education and Youth Affairs, 1991, p. 7; Forster, 1994, p. 24; Vasilevska, undated). The Mentor Links Program was therefore designed with the aim of increasing chances of a gifted student to develop potential and satisfy learning needs (Forster, 1994) by allowing the student “to direct and extend their learning under the guidance of an adult with a high degree of expertise in a particular area” (Forster, 1994, p. 24; cf. Vasilevska, undated).
In setting up the programme, a particular issue which caused concern was the question of liability. "Legal advice was sought from the Department's legal service and risk management group to be sure that the program was operating with all due precaution" (Forster, 1994, p. 27). People involved in the Mentor Links Program give their time and expertise voluntarily, are known or recommended by other sources, and are subject to a police security check. The mentor and student are to meet outside of school hours and away from the school, parents are to stay with the student during meetings, and personal security is the parents' responsibility. Parents are to plan with the mentor appropriate activities, and all costs are to be met by parents. (Forster, 1994, p. 27; Vasilevska, 1997, personal communication.)

The first step in establishing the Mentor Links Program was to compile registers which identified people who were available to act as mentors (Forster, 1994, p. 24; NSW Department of School Education, 1991b, p. 2). However, "some enthusiasm was shown for the program by potential mentors but actual participation was another point" (Forster, 1994, p. 24). Therefore, it would seem advisable that the first step should rather be to establish the needs of students who might be involved in such a programme (cf. Clasen & Clasen, 1997, p. 224).

One way of assessing how implementation of the policy has been facilitated at the regional level is to consider the "various constraints and activities involved" in the Mentor Links initiative (Forster, 1994, p. 25). I believe that, at least on the north coast of NSW, the programme has met with only limited success. Considerable time and energy were expended (for example, by the Southern Cross Gifted and Talented Education Association, Geake, 1997, personal communication) in setting up a data base of potential mentors, but not one of these people has actually acted as a mentor for a gifted student within the Mentor Links programme. Interviews with gifted
students who expressed a keen interest in being linked with a mentor have proved to be very time consuming. The restrictive guidelines for running Mentor Links have precluded most of these students from involvement in the programme (Merrotsy, written reports to NSW Department of Education, 1997, 1998, 1999).

If Mentor Links is to have an impact, at least on the north coast of NSW, there will need to be some major changes made to how it is organised and run. The NSW Department of Education would need to accept some responsibility for what happens within the programme, even though any learning outcomes may not necessarily satisfy formal curricula requirements (House, 1987 p. 28; cf. VanTassel-Baska, 1989b, p. 184; Feldhusen, 1994d, p. 370). The contribution of the mentor would need to be formally recognised, perhaps financially. The coordinator of the programme would need much more support in terms of time, space and resources. Money should be made available for incidental costs (Merrotsy, written reports to NSW Department of Education, 1997, 1998, 1999; cf. Clasen & Clasen, 1997, p. 226).

As Clasen and Clasen (1997, p. 222) appropriately point out, “Although mentorships frequently are recommended as a component of gifted programming, ... mentorships involving gifted students actually are not common.”
Mathematics

An examination of the NSW Board of Studies syllabi for Mathematics gives an instructive example of how formal courses approach the education of gifted students. Mathematics is “a dynamic and process-oriented subject” which has “an important body of knowledge and skills” (NSW Board of Studies, 1996a, p. 7).

In primary school, a student gifted in Mathematics is seen to be an exceptional student whose needs are considered along with the needs of students with a disability or learning difficulty (NSW Department of Education, 1989, p. 40). No provision beyond the regular classroom is outlined by the Kindergarten to Year Six Mathematics syllabus. “The talented student will respond to teaching strategies that focus on enquiry, problem solving and critical thinking. Appropriate extension and enrichment activities ensure that favourable attitudes towards Mathematics are maintained. ... Technology can assist all exceptional students.” (NSW Department of Education, 1989, p. 40.)

For students in Years Seven and Eight, the syllabus emphasises the processes and the content of Mathematics. “Students are to be actively involved in learning, doing and using mathematics to solve problems.” (NSW Board of Secondary Education, 1988, p. xii.) Individual differences should be taken into account, with consideration given to each student’s current stage of development (NSW Board of Secondary Education, 1988, p. v).

The NSW Board of Studies boasts that for Years Nine to Twelve there is a variety of Mathematics courses “which cater for the needs and abilities of all students” (NSW Board of Studies, 1991a, p. 41).
Advanced Mathematics is an abstract course for Years Nine and Ten, designed for those students who have achieved all of the outcomes of the Stage Four syllabus.

"The course emphasises algebraic processes, graphical techniques, interpretation, justification of solutions, advanced applications and reasoning, which arise in more sophisticated problems from realistic applications." (NSW Board of Studies, 1996a, p. 9.) It is advised that students intending to study Extension 1 (3 unit) Mathematics should study Further Geometry, Curve Sketching and Polynomials, and Functions and Logarithms, which are options (NSW Board of Studies, 1996a, p. 23). Circle Geometry is an option; Matrices are introduced only in the Network option. Set Theory is not included.

Throughout the syllabus, and in particular under the heading “Equity Principles and Issues” (NSW Board of Studies, 1996a, pp. 11-13), there is no mention of students gifted in Mathematics.

The Extension 1 (3 unit) Mathematics course, for students in Years Eleven and Twelve, is designed for those who “have demonstrated achievement of the outcomes in the Core of the Advanced Mathematics course ... along with the recommended options” (NSW Board of Studies, 1996b, p. 21).

The Extension 2 (4 unit) Mathematics course is designed for year 12 students with a special interest in Mathematics who have shown that they possess special aptitude for the subject. It represents “a distinctly high level in school mathematics” which involves the development of “considerable manipulative skill and a high degree of understanding” of the fundamental concepts of algebra and calculus, and thus offers appropriate preparation for the study of Mathematics at university. While the general aim of the course is to present Mathematics as “a living art which is intellectually exciting, aesthetically satisfying, and relevant”, a specific aim is “to offer a
programme which will be of interest and value to students with the highest levels of
mathematical ability ... and which will present some challenge to such students”
(NSW Board of Secondary Education, 1989, p. 7). The objectives of the Extension 2
Syllabus are addressed through eight topics: Graphs, Complex Numbers, Conics,
Integration, Volumes, Mechanics, Polynomials, and Harder Extension 1 Topics.
Topics which are suitable for students gifted in Mathematics, and which are notable
by their absence, include Matrices, Vectors, Number Theory, Group Theory, Further
Calculus (mean-value theorem), and Sequences and Series (convergence). In 2001,
approximately 2600 students attempted the Extension 2 Mathematics HSC
examination, which constituted over one quarter of the candidates for the Extension 1
Mathematics HSC examination. Forty five percent of these students demonstrated
achievement in the top performance band (E4) for this subject (Yager, 2002, personal
communication).

The NSW Board of Studies syllabi for Mathematics are clearly strong documents,
and meet the needs of a broad range of students. However, these documents do not
refer specifically to students who are gifted in Mathematics. It is quite feasible that,
given the restrictions within which many schools must operate, there may be a
significant number of students who are gifted in Mathematics and whose needs are
not being met by the current syllabi.

Other provisions in Mathematics

There are a large number of competitions in which students may enter, and many
enrichment programmes are run by schools and tertiary institutions.

The Tournament of Minds is a problem solving event for teams of primary and
secondary students in the disciplines of “Language Literature, Maths Engineering,
and Social Sciences (sic)” (brochure from Tournament of Minds; <http://www.tom.edu.au>). The University of New South Wales offers a Scientia Challenge Program for Gifted and Talented Students, with workshops in a broad range of subjects which usually does not include a specific Mathematics topic. This programme is sponsored by McDonald’s Australia Limited and runs at a cost to the student of $200 plus transport plus accommodation for a two day workshop. In conjunction with the Scientia Challenge Program, GERRIC also presents a Career Development Day for Academically Gifted Students (brochures from GERRIC; <http://www.arts.unsw.edu.au/gerrick>).

The best known Mathematics competition is the Australian Mathematics Competition, organised for secondary school students by the Australian Mathematics Trust at the University of Canberra. It attracts over 500,000 entries from around the world (Thornton, 2001, personal communication; <http://www.amt.canberra.edu.au>). The University of New South Wales runs the School Mathematics Competition, which is an unconventional examination seeking to acknowledge insight and ingenuity in senior secondary school students (brochure from UNSW). The Mathematics Association of NSW offers an extended problem solving project with the J.L. Williams Competition, which is used to select Year Eleven students for the prestigious National Mathematics Summer School (brochure from Mathematics Association of NSW, “Mathsearch”).

The University of New South Wales publishes the Mathematics magazine “Parabola” aimed at secondary school students (<http://www.maths.unsw.edu.au/Parabola>).

The Australian Mathematical Olympiad Committee has developed a world-class problem solving programme, which is organised for secondary school students by the Australian Mathematics Trust at the University of Canberra. This consists of: the
Maths Challenge Stage, a three-week problem solving project; the Euler, Gauss, Noether and Polya series of the Maths Enrichment Stage, a systematic, structured, comprehensive extension and problem solving course; the AMOC Intermediate Contest; the AMOC Senior Extension Program I; the AMOC Senior Maths Contest; the AMOC Senior Extension Program II; the AMOC Australian Mathematics School of Excellence; the Australian Mathematical Olympiad; the Asian Pacific Mathematics Olympiad; the AMOC 1:1 Mentor Program; the Olympiad Selection School; and the AMOC International Mathematical Olympiad Preparation School (<http://www.amt.canberra.edu.au/amtamoc.html>).

Many of these other provisions in Mathematics are fine programmes, and provide excellent learning opportunities and many hours of enjoyment for a significant number of students. In implementing these programmes, it must be ensured that they meet the requirements for a defensible differentiated curriculum as outlined by Borland (1989, pp. 176f.; *vide supra* pp. 16f.) concerning consensus, scope and sequence, and planned articulation with the core curriculum. Indeed, it may be appropriate for some form of central coordination of extra curricula enrichment and extension programmes in Mathematics, so that they complement rather than compete with the core curriculum. This would have the added benefit of facilitating equity of access to worthwhile programmes for students who are gifted in Mathematics.

**National inquiries**

It is noteworthy that there are currently two national inquiries concerning the education of gifted students. The Evaluations and Investigations Programme of the Commonwealth Department of Education, Training and Youth Affairs is undertaking the project of examining the different arrangements which allow secondary school
students to gain university credit while still at school (McDonald, 2001, personal communication).

The Senate Employment, Workplace Relations, Small Business and Education References Committee has accepted submissions to a Senate inquiry into the Education of Gifted and Talented Children. The terms of reference for the inquiry were: to review the developments since the previous report (Commonwealth of Australia, 1988); to consider whether current policies and programmes are suitable and sufficient to meet the special educational needs of gifted students; and to consider the proper role of the Commonwealth in supporting the education of gifted students (Commonwealth of Australia, 2000).

Responses to the senate inquiry from education unions have been quite negative, and, I feel, unproductive if not counterproductive to meeting the educational needs of gifted students. Guided by the philosophy that “every kid is special”, the Australian Education Union believes that “the most effective way of maximising the potential of all students is in a heterogeneous learning environment” and “is therefore opposed to programs for gifted and talented students when they involve the bulk of in-school time, streaming, or other forms of segregated and selective education” (Martin, 2001, p. 6). In an amorphous submission from the NSW Teachers Federation, reference was made to “the research” to conclude that “the most appropriate form of education for all is the comprehensive public school, where the full range of abilities is catered for. For this to occur, schools and teachers need resources and support commensurate with the task,” which includes smaller class sizes, pre-service training, and improved funding (Currie, 2001, p. 7).

The Senate Committee handed down its report on October 2001, and indeed found that there is a problem with education of gifted students. “These children have
special needs in the education system; for many their needs are not being met; and many suffer underachievement, boredom, frustration and psychological distress as a result" (Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001, Paragraph 1.1).

It is therefore opportune to reflect on a conclusion handed down by the Senate Select Committee thirteen years ago.

If the Commonwealth Government does not accept a leadership role in this area, the education of gifted children could continue to receive little attention in some areas of Australia. ... Therefore to allow the gifted in this country to reach their full potential the Committee recommends that the Commonwealth Government make a clear statement that special educational strategies should be provided for gifted children throughout Australia (Commonwealth of Australia, 1988, p. 142).

The status of education of gifted students in NSW

As Gross (1993, p. 29) says, there are “some fine programmes for gifted students” in NSW, at least in mathematics! However, it is also fair to say that there is much more that can be done. The sixteen years, which have passed since Braggett’s important and far-sighted report on the status of education of gifted children, have not witnessed the community enthusiastically embracing Braggett’s recommendations (Bailey, 1998).

Gifted students and teachers of gifted students need appropriate support. Systemic changes to the structure of teacher training courses, to school organisation, and to continued training and development of professional teachers, are all warranted. Proposals for school organisation changes, which facilitate flexible progression and acceleration, need to be translated into effective practice. Curricula, syllabi and programmes which specifically address the needs of gifted students, and which are
informed by research, are still in great need of development, evaluation, and refinement.

It is important to note that accelerated progression and access to more demanding, higher level courses are readily available educational options. They are options which are little used in Australia (Bailey, 1998).
The Milieu:

The High School in Our Town

"If the untrained infant's mind is to become an intelligent one, it must acquire both discipline and initiative."

(Alan Turing.)
The Milieu

The High School in Our Town

This study concerning appropriate curriculum for academically accelerated students stands firmly within the context of a real public high school, and involves a group of real students as well as a real teacher. It is therefore most important to understand and appreciate the situation in which they live, study, work and play. I place this study within its social and cultural context by exploring the ethos of the town and the school, by outlining the school’s curriculum, and by analysing the school’s current policies and practices in the education of gifted students. In order to match up the experiences at The High School with experiences elsewhere, I also offer a national perspective on rural and remote education. I then describe the historical genesis and development of this study within its educational context.

Our Town

Our Town is a small, rural, relatively isolated town about ten hours drive from Sydney. It nestles into a gentle valley, and is surrounded by picturesque farmland, extensive tracts of open forest and towering rainforest, and spectacular mountains. The village is home to about three thousand people, and the population has been stable for the past twenty years. The median age of the population is thirty five. The shire has a steadily increasing population just short of ten thousand people. More than half of these people live on rural properties, and a significant proportion of these people seek to live an “alternative” lifestyle. Unemployment is high, and, for the past decade, has remained at more than twice the state average. The median individual wage is about $200 per week, and the median household income is about
$430 per week. The local economy is dependent on primary production, and has been seriously affected by the whims of the beef industry, the closing of rainforest and old growth forests to logging, changes to the timber industry, and deregulation of the dairy industry (Murray, 2002, personal communication).

There are very few services for youth in Our Town. A swimming pool is open for six months of the year, and entry costs $2 plus GST. A cinema shows recently released movies, tickets for which cost $7. A skating park opened during the winter, and has become a popular meeting venue. A youth centre is a focal point for many adolescents, especially those experiencing problems of various sorts. Programmes run by the youth centre have targeted depression, drug abuse, and youth suicide. Occasionally, perhaps three times a year, there are supervised school socials and community dances or “doof” parties. Public transport is poor. There is no regular bus service to transport people to a large centre about one hour away, or to the beach about two hours away. Community sports include swimming, cricket, athletics, touch football, netball, rugby league, and soccer. There is a small but active scouting group (Brown, 2001, personal communication).

The High School

The High School is a small, rural, relatively isolated, co-educational, comprehensive high school, servicing Our Town and the surrounding districts. The school’s red brick buildings reflect the unimaginative public building architecture of fifty years ago, and are set in spacious, grassed grounds. Shade, at times, is at a premium. Two covered areas have been erected, and an environmental project team are endeavouring to beautify the school by extending the gardens and increasing the number of shade trees. There is a large sporting field, and an adjoining school farm. Two years ago, the school basketball and tennis courts were deemed by the
Department of Education to be dangerous and were closed. There are six
demountable buildings, used mainly for specialist subjects. Earlier this year the
community had to mount a public campaign to keep them.

There are approximately five hundred students enrolled at The High School. This
represents a decline in enrolments from 1998, when a record 650 students began the
school year. The student population consists of about 55% male and 45% female
students, and about 5% identify themselves as Aboriginal. “There is a diverse range
of students and it is a feature of the school that students show a high degree of
tolerance and respect for each other and maintain a harmonious space” (Marriott,
2001, personal communication). Most students do not live in the village of Our
Town, and travel by bus for up to one and a half hours each way to and from school.

There are almost sixty teachers and support staff at the school. A significant
proportion of teachers live in other centres, and travel for up to an hour each way to
and from work. The average age of the teachers is forty eight. A School Council
makes important contributions to the school’s management plan. A small but active
Parents and Citizens Association gives valuable support, and raises funds for items
which otherwise the school could not afford.

The High School has a proud academic, cultural and sporting tradition. During the
past few years, there have been major achievements in Music, Art, Drama, Design
and Technology, Aboriginal Studies, and Business Studies, top state and national
results in Mathematics and German, and strong state representation in student
politics and a wide range of sports. In 1996, the Department of Education announced
it to be the fourth best high school in NSW. At the beginning of 2002, for the first
time, the school was accepted into the Priority Schools Funding Program.
Curriculum offered by The High School is diverse. The junior curriculum is based on nine lines. Classes in Year Seven are graded, and study a programme of compulsory courses. Students in Years Eight, Nine and Ten study a mixture of compulsory courses, including core classes, for each year group, in English, Mathematics and Science, and elective courses chosen from units based on a vertical semester organisation.

The senior curriculum is based on six lines, with English and Mathematics being the only subjects offered on two separate lines. Subjects offered on the other four lines are the result of student demand. Care is taken to ensure that students with a broad range of academic ability have access to appropriate courses and that there is no gender bias in subjects on specific lines. Students have access to a range of vocational education and training (VET) courses, which are run within the school and in the regional centre. Courses at Extension 1 (3 unit) level, and Mathematics at Extension 2 (4 unit) level, are maintained, although, due to small candidature, often have reduced face to face teaching. These subjects are usually not timetabled and so are often studied either before or after school. Students are also able to access courses through distance education centres.

Four things are cited as having great impact on The High School’s curriculum: incoming students who are identified to need special support and resources; loss of students during Year Eleven; Department of Education changes to mandatory requirements in the junior curriculum; the changes manifest in the New HSC (Marriott, 2001, personal communication).
Vertical Semester Organisation

For the past eight years, the curriculum for Years Eight, Nine and Ten has been based on a vertical semester organisation (VSO). For the VSO, units of study have been developed so that they can be studied during the course of one semester, and designed so that they cover mandatory requirements for the School Certificate in discrete topics. Units are structured so that they are at an appropriate level of difficulty, described as levels two, three and four which approximate to Years Eight, Nine and Ten respectively. Students may choose, with certain restrictions, from all subjects on offer within the VSO. It is therefore possible, for example, for a Year Nine student to choose a level four unit.

VSO offers in theory many advantages (over traditional age/grade lock step curriculum organisation) to higher ability students, of which being able to accelerate their study is one. Other forms of catering for these students, such as enrichment, are also possible with VSO. By enrolling in specific units, in-depth study may be undertaken involving more complex content and higher level processes (Fardell, 1997, p. 4).

During 2000, the VSO was evaluated by a school committee. The aim of the evaluation was to determine: whether the VSO did, in fact, provide students with greater subject choice; whether the structure of the VSO best prepared students for their School Certificate in the core subjects and met syllabus requirements in all subjects; and whether the subject selection process was effective and equitable. The committee found that the VSO did allow for the formation of a wide range of classes, with a clear benefit for students in Years Nine and Ten. School Certificate results for the core subjects were close to state average, but some students might be disadvantaged due to the arrangement of elective units in core subjects. The selection process did allow for student counselling, but a significant number of students were forced to choose units they did not want to study, and were unsure of
the actual subject that they were studying. The committee recommended that: Year Eight be removed from the VSO; the VSO be maintained for Years Nine and Ten, with no elective units offered in English and Mathematics; and students identified to have specific learning needs be given first access to the subject selection process. It was not expressed clearly whether gifted students, and students who have academically accelerated their schooling, were considered to have specific learning needs. Subsequently, in 2001, a new curriculum model was implemented (Marriott, 2001, personal communication).

It is interesting that, before this restructuring of the VSO, a high proportion of students, more than 50% of Years Eight and Nine, willingly or unwillingly or perhaps unwittingly, took advantage of accessing higher level units, although, to place this in perspective, this represents approximately 5% of total unit enrolments (Fardell, 1997, p. 2).

**Gifted and Talented Students Policy**

Following the release, in 1991, of the NSW Department of Education policy documents on the education of gifted and talented students, a “Gifted and Talented Committee” was formed. It consisted of the (then) Principal and two class teachers. Rather than formulating a policy which addressed specific local needs, the Principal decided that the state policy would be adopted as the school policy. During the past seven years, the committee has not met.

One committee member introduced a range of “Gifted and Talented programmes”. These were not developed to meet identified needs within the school, but were imported holus bolus from that teacher’s previous school. One interesting programme was the “Gifted and Talented Project”. Students, who were self-selected,
found a mentor and arranged to be released from two lessons each week for the
duration of the project. Projects included preparing natural medicines, designing and
making silver jewellery, and creating a tessellation and screen printing it. Very few
of the participants were high ability students, and in fact a majority were considered
to come from the other end of the academic spectrum (Thompson, 1995, personal
communication).

The other committee member accepted the role of coordinator of gifted and talented
students within the school. Responsibilities for this position include administrative
work, disseminating information to staff and students, attending professional training
and development courses concerned with the education of gifted students, leading
staff in-service sessions on the education of gifted students, liaising with feeder
primary schools, counselling gifted students, acting as case manager for gifted
students with special needs, developing programmes for gifted students, and
developing programmes for students who have academically accelerated their
studies. The teacher concerned also brought to this role the responsibility of working
with individual students of high academic ability who had special curriculum needs.
This includes teaching extension work in mathematics, tutoring students involved in
tertiary level courses, and tutoring students who have academically accelerated their
studies and find unavoidable clashes on their timetable. In recognition of the work
being done, the position of coordinator attracts a period allowance of one period per
fortnight, reviewed annually. The High School cannot afford to give this teacher a
more appropriate period allowance.

**National Inquiry into Rural and Remote Education**

It is natural to ask to what extent the experiences at The High School in Our Town
reflect the experiences at other schools in other towns in Australia.
In March 2000, the Australian Human Rights and Equal Opportunity Commission handed down its report on rural and remote education. The inquiry investigated the availability, accessibility and quality of educational services, including technological support services, for children in rural and remote areas (Human Rights and Equal Opportunity Commission, 2000, Paragraph 1.1).

Distance is an obvious cause of disadvantage for rural schooling. Prolonged travel time, poor road conditions and lack of transport options all have a considerable impact. Ramifications, such as difficulty in accessing classes or sport after normal school hours, reduced specialist teacher time, difficulty in accessing inservice training for teachers, and poor availability of casual teachers, are less obvious, but are ways in which the disadvantage is manifested (Human Rights and Equal Opportunity Commission, 2000, Paragraph 3.6). Schools and families struggle to provide for country students extra-curricular educational and experiential opportunities which metropolitan students take for granted (Human Rights and Equal Opportunity Commission, 2000, Paragraph 4.5).

A significant difference in average outcomes for country students raises issues of equity for rural and remote students when compared with urban students. Particular differences which need to be overcome include: less experienced staff and higher staff turnover; substantially less access to information technologies; and fewer opportunities for competition, to participate in cultural and political life, and for appropriate work experience (Human Rights and Equal Opportunity Commission, 2000, Paragraph 7.3).

The report also notes that inappropriate and inflexible school timetabling were constraints which adversely impacted on access to education (Human Rights and Equal Opportunity Commission, 2000, Paragraph 3.3). Access to and acceptability
of education will be enhanced when students are involved in the planning and design of curriculum. "Children who are sufficiently mature to understand the issues are also entitled to have a say in their education" (Human Rights and Equal Opportunity Commission, 2000, Paragraph 7.4).

It is highly significant that, throughout the report, there is no attention given to gifted students.

Towards a model for academic acceleration

In 1989, I began working very closely with Albert, who is the subject of Case Study Two, because he showed exceptional problem solving ability in Mathematics. Three years later, he expressed a strong desire to academically accelerate his schooling by skipping a grade, preferably in all subjects, but at least in Mathematics. He was prevented from so doing by several factors which included the way in which The High School's curriculum was organised.

During the next two years, Albert topped Australia in a national Mathematics competition, was selected as a member of the training teams for the Physics, Chemistry and Mathematics Olympiads, and worked on a post-graduate project with doctoral students at a university.

Because I believed that Albert’s intellectual and academic needs were not met by the curriculum offered to him, I set about exploring ways of changing the curriculum. Initially, this resulted in the expansion of the extension programme in Mathematics, a programme of advanced problem solving, a programme in Philosophy, and a programme of work experience within a research laboratory at a university. Albert was also advised to learn a foreign language and to learn to play a musical instrument.
When, in 1994, The High School introduced a Vertical Semester Organisation, one motivating factor was to better meet the needs of gifted students such as Albert.

Prior to this change in the junior curriculum, students realistically could academically accelerate their studies only in a limited number of ways: by being young in grade, that is, starting school early; by skipping a grade during infants or primary school; by moving from another state education system; and by skipping a grade during Years Seven to Ten, which needed, for some reason, the approval of all faculties within the school, and for which there was no precedent. The VSO system did facilitate access for students in Years Eight and Nine to higher level, more demanding courses. Students who took advantage of this did not enjoy this luxury when they were in Year Ten.

At the same time, I began also working with Kerr, who is the subject of Case Study Five. He was in primary school at the time, and had met all of the outcomes of Stage Four (Year Eight) Mathematics. When he made the transition to high school, he was enrolled in Year Seven for most subjects, but was studying Year Nine Advanced Mathematics. Timetabling problems immediately became apparent. These problems were only exacerbated when Kerr introduced the idea of a junior student studying courses from the senior curriculum. It was therefore necessary to develop an appropriate curriculum model which facilitated gifted students like Kerr to academically accelerate their studies.

In 1996, Elise, who is the subject of Case Study Three, academically accelerated her studies in Mathematics. Many people were asking the question, intended to be pejorative, “But what are they going to do when they’ve finished some of their HSC early?” The obvious riposte, at the time, was, “A Distinction Course, of course!” However, the problem was, indeed, more complicated than that. A Distinction
Course is equivalent to two units of HSC study, albeit at a tertiary level. By 1997, Elise was studying eight units of Preliminary HSC subjects one year ahead of her cohort, Kerr was studying a three unit HSC subject three years ahead of his cohort and six units of Preliminary HSC subjects two years ahead of his cohort, and J, who is the subject of Case Study Four, was studying a two unit Preliminary HSC subject two years ahead of his cohort. Also, whilst Elise was deeply interested in philosophical issues, neither Kerr nor J expressed any particular interest in any of the three Distinction Courses. Therefore, in order to maintain continuity of curriculum for these students, it was necessary to develop an appropriate curriculum model which enabled academically accelerated students to gain access to tertiary level courses while still at school.

Accordingly, I approached the Universities of Sydney, New South Wales, Queensland, and New England, Macquarie University, and the regional university, making representations at Head of Department or Pro-Vice Chancellor level.

Responses, as one would expect, were varied. “We do not want sixteen year old students here.” “The courses we offer are probably not suitable for high school students.” “We will give you a copy of the syllabus and you can teach them. They may then sit for the yearly examination at a cost of $20, and, if they get a good pass, we will then recognise them.” And, *sotto voce*, take all the credit. “We can immediately offer extension work, link each student with a tutor, and see what happens.”

The response from the University of New England was unequivocal support for the idea. On completion of an HSC subject, a high school student may apply, in writing, giving cause for why he or she should be given special permission to enrol,
externally and part-time, in a degree or non-degree course. Applications are to be supported by documentation and an endorsement by the school principal.

While they were still at school, each of Elise, Kerr and Jen enrolled in tertiary courses at the University of New England. The courses were in Computing Science, Indonesian, Latin, Mathematics, and Philosophy, and were undertaken, variously, at first, second and third year level. The experiences, both positive and negative, of these three remarkable students are detailed in their respective case studies. It must be emphasised that the tertiary studies which these students completed were seen by the school and by each of them to be a formal and integral component of their senior high school curriculum.

It was within this context, then, that I developed a model for academic acceleration. It is readily admitted that the development and implementation of these curriculum initiatives for gifted students took place in an informal, perhaps \textit{ad hoc}, certainly \textit{ad hominem}, manner. During the course of each programme, mistakes were made and were endeavoured to be ironed out by myself and the student involved. Therefore, in 1998, in order to formalise what was being attempted, to set the developed curriculum on a sound philosophical and pedagogical basis, and to carry out a research project which would help The High School cater for the needs of its gifted students and make it easier for academically accelerated students to access courses of a level appropriate to their intellectual and academic abilities, I enrolled in a post-graduate research course and this study was born.
Methodology

τοις δ' ανέστη

Μεντώρ, ὁς ὁ Ὀδυσσῆος αμυμόνος ἡν ἐταιρος,
καὶ οἱ οἷον ἐν νήσουν ἐπετρεπέν οὐκον ἀπάντα,

πειθέσθαι τε γεροντί καὶ εμπέδα πάντα φυλασσείν.
(Homer, *Odysseias*, B 224-228.)

(Mentor was an honoured friend of Odysseus, and the king’s whole household had been entrusted to him, with the request to keep a steadfast and wise watch on everything.)
Methodology

This study, which arises from critical and reflective teaching praxis, is predicated on conducting research through service to gifted students (cf. Benbow & Lubinski, 1997, p. 155). It is concerned with appropriate curriculum for gifted students, in particular, those who have enjoyed the benefits of academic acceleration.

Following Fielding and Cavanagh (1983, p. 17), curriculum may be taken to be “a plan describing how education might be carried out in practice such that learners and teachers are provided with the means of attaining specified educational goals”, which include social and cultural goals as well.

Two attributes are implicit within this understanding of curriculum: a curriculum is an expression of particular value preferences subscribed to by the makers of the curriculum; and a curriculum makes an assumption of who is appropriate to make decisions concerning the curriculum. (Fielding & Cavanagh, 1983, p. 18.)

Since gifted students are often in the best position to say what is needed for their optimal development (Silverman, 1989, p. 79), and are sufficiently mature to appreciate the issues involved, they have an intrinsic right to be involved in decision making processes concerning their curriculum. This study, therefore, enters into a dialogue with gifted students in order to address appropriate curriculum for gifted students.

Because of the small population (nine) of students considered for the study, analytic methods are not appropriate (Callahan & Hunsaker, 1991; Buchanan & Feldhusen, 1991; cf. Stenhouse, 1988, p. 49). Furthermore, there is no control group for research on gifted students (Hunsaker & Callahan, 1991).
Rather, the stories told by the participants are presented as case studies. They are not case studies in the traditional sense (Stenhouse, 1988, p. 49; Bassey, 1999, pp. 22-36). Here, the naturalistic portrayal of individuals follows a life history model, employing the narrative, in order to make cases to appeal to the reader’s judgement.

The case studies raise important issues of equity and social justice, and thus the research methodology finds a suitable philosophical framework in critical theory. For critical and reflective teaching praxis, the application of critical theory emphasises moral and ethical teaching practice.

Case study methodology

Case study is a qualitative method quite suitable for use as a research tool in education and more specifically curriculum (Cavanagh, 1992). It is a prime strategy for developing theory which informs educational policy and enhances educational practice (Bassey, 1999, pp. 57-64).

Stenhouse (1988, pp. 49f.) identified ethnographic case study, which he located within the social sciences, and three styles of case study which were concerned with different aspects of educational action: evaluative, educational, and action research case studies. In particular:

In evaluative case studies a single case or a collection of cases is studied in depth with the purpose of providing educational actors or decision makers … with information that will help them to judge the merit and worth of policies, programmes, or institutions.

(Educational case study is used by researchers who) are concerned to enrich the thinking and discourse of educators by the development of educational theory … through the systematic and reflective documentation of evidence.

Case study in action research … is concerned with contributing to the development of the case or cases under study by feedback of information which can guide revision and refinement of the action (Stenhouse, 1988, p. 50).
Case study methods have numerous possible advantages for educational research.

Their strong, dynamic nature is highlighted by Cavanagh (1992, p. 161):

The case study is specific to an area of interest. It enables the researcher to ask direct questions of people involved in the study and the researcher can also be guided by what the participants think is valuable. It is dynamic ... and at times highly unpredictable. Those people affected by the study are often directly involved in it and often critical issues can be solved on the spot.

Furthermore, case studies are realistic, their insights allow direct interpretation and may be put to use, and, at the same time, they invite generalisations. Although at times hindered by their length, they do present research in a publicly accessible form.

By giving careful attention to the subtlety and complexity of the case in itself, whilst recognising the fabric of the social milieu, they constitute an archive of rich descriptive material which will admit subsequent reinterpretation. “The best case studies are capable of offering some support to alternative interpretations” (Bassey, 1999, p. 23).

Criticisms of case study usually centre on the problem of generalisation (Bassey, 1999, pp. 30-36). Certainly, it must be remembered that, because case study is the study of “a singularity conducted in depth in natural settings” (Bassey, 1999, p. 47), “the case itself can never be replicated” (Cavanagh, 1992, p. 152).

The antinomy between the study of the singularity and the search for generalisation may in fact be welcomed, and for Simons (quoted in Bassey, 1999, p. 36) it is the point of case study because it affords a holistic perspective:

Living with paradox is crucial to understanding. The tension between the study of the unique and the need to generalise is necessary to reveal both the unique and the universal and the unity of that understanding.

Researchers do need to be careful not to overstate their findings. The privilege and responsibility of interpretation must be balanced by an ethic of caution (Bassey, 1999, pp. 30-36).
1999, pp. 32f.). Stake (quoted in Bassey, 1999, p. 33), therefore, contrasts the
generalisations made publicly by the researcher and privately by the reader:

To assist the reader in making naturalistic generalisations, case researchers
need to provide opportunity for vicarious experience. Our accounts need to
be personal, describing the things of our sensory experiences, not failing to
attend to the matters that personal curiosity dictates. A narrative account, a
story, a chronological presentation, personalistic description, emphasis on
time and place provide rich ingredients for vicarious experience.

Stenhouse (1988, p. 53; cf. Bassey, 1999, pp. 73-79) also highlights two important
ethical problems particular to case study. Firstly, and foremost, the portrayal of
individuals in a case may subject them to the possibility of recognition. Secondly,
there is contention as to whether the body of data gathered about an individual is
considered to be owned by the individual or the researcher.

In this study, the case studies arise from a perceived need to develop and implement
curriculum initiatives for gifted students. This process employed, in part, aspects of
action research, although it is admitted that this involved neither a collaborative,
participatory element nor a prior question which the students came together to study.
The case studies also evaluate state and school-based programmes and provisions for
gifted students, and will be used to inform educators of a working model for
academic acceleration. Therefore, the case studies adopt a strategy close to each of
the evaluative, educational, and action research styles of Stenhouse (1988, pp. 49f.).

**Narrative and hermeneutic**

Case studies may be suitably developed through the form of inquiry called

“Narrative” refers to stories of long term life events, and to research methodology
(Clandinin, cited in Grenfell, 1997). Indeed, Drake and Ryan (1994) report on the
growing use of narrative as a research tool in an educational context.
My understanding of narrative is deeply indebted to the work of Schleiermacher (1838, 1977) on hermeneutics, and of Jüngel (1974) on metaphor. Either parable (Gleichnis) or metaphor (metaphorische Wahrheit) may be a better term than narrative.

Narrative, of course, means story telling, and this implies that there is a listener. It is stressed that listening is just as important as the telling, and by this something deeper is meant than simply listening. When stories are shared, a relationship develops between people in dynamic dialogue, and a point of contact (ein Anknüpfungspunkt) is established (Drake & Ryan, 1994, pp. 50f.).

Narrative reporting of case studies has significant advantages for educational research.

Narrative affirms that research is both a social process and a linguistic product. Narrative gives voice, within a social and cultural context, to people who, in the past, have not enjoyed the facility of public expression, to people who, traditionally, have been marginalised or silenced (cf. Drake & Ryan, 1994, p. 45; Noddings, cited in Witherell & Noddings, 1991, p. 263). The notion of voice also asserts the political right to speak and to be represented in a way which conveys “the tone, the language, the quality, the feelings” of the speaker or writer (Grenfell, 1997). That is, voice allows participation in a social world. However, even though the same language is being spoken in the social world, the language is polyvocal, which suggests both that it is spoken with many voices and that it is subject to multiple meanings or polysemy. Which voice and which meaning predominate are determined by a whole host of complex and interrelated factors concerned with textual politics. The existence of “diverse and conflicting voices” (Gagnon, quoted in Grenfell, 1997) is
emphasised by Bakhtin (cited in Witherell & Noddings, 1991), who uses the term *heteroglossia* to remind us that none of us fully subscribes to one particular voice or meaning, and that we are continually subject to competing voices and meanings.

Narrative is direct, yet subtle. Its directness stems from readers being familiar with its conventions, and from the author being constrained, by the narrative form and by the particular story being told, from presenting one’s own logic. Its subtlety arises from the capacity to capture equivocation, tensions, contradiction, conflict, compromise, change, and complexities (Connelly & Clandinin, 1988, p. 153; Stenhouse, 1988, p. 52; Fulwiler, 1997, p. 97; Witherell, 1991, pp. 92-94). “Stories intensify life” (Trimmer, 1997, p. ix).

Narrative highlights contextual constraints. Indeed, not all knowledge can be represented by structural models. “Rather than abstract our teaching into empirical research or bury it in ethnographic studies, we need to face ‘the real moments’ we encounter each day. And we need to trust our stories of these moments” (Trimmer, 1997, p. xv; cf. Witherell & Noddings, 1991, p. 252).

To narrate is to know (Bruner, 1990):

> A narrative format allows (a person) to present views of the world that are not necessarily filtered through a perspective that assumes a uniformity of experience. Stories are able to do so because they provide a medium through which (people) can make sense of their unique and often different life situations. Indeed the construction of such stories represents a particular way of knowing (Drake and Ryan, 1994, p. 49).

Narrative is a public expression of knowledge (Witherell & Noddings, 1991, pp. 153, 251), translating knowledge into a meaningful form for others. It informs and engages the reader by describing and explaining (Marsh, 1992, p. 134).

It is readily admitted that narrative is certainly more than simply a form of knowledge, that it also delivers an argument. Indeed, each story has its own story to
tell: it has its own particular cultural and social context; and, as Grenfell (1997)
warns, it comes equipped with its own textual political baggage. However, narrative
does provide a way of understanding experiential knowledge in so far as it is a
meaning-giving account, and, as such, it is an interpretation of history (Connelly &
Clandinin, 1988, pp. 74f.). The very real strength of narrative is the way in which its
metaphor provides a form of educational encounter that enables the reader to imagine
and experience the feelings of others and, subsequently, to reinterpret history
(Witherell, 1991, p. 94). Thus, just as the researcher unfolds the story, so too is the
reader invited to take possession of the story and to continue to shape its meaning
through speculation about alternative interpretations (Marsh, 1992, p. 135; cf.

This interplay between researcher and reader reflects the dynamic nature of
understanding, so well portrayed in the hermeneutical circle (Gadamer, 1975, pp.
250ff.). In a seminal, handwritten manuscript, which apparently is little known to the
narrative literature, Schleiermacher (1838, 1977) argues that interpretation is
basically and utterly (schlechthin) a referential procedure: the whole is understood
from its parts and the parts are understood from the whole. Each statement in a
person’s narrative must be considered in the context of that person’s development.
However, that development is nothing other than the sum of the moments in the
person’s life. In order to better understand what is meant, the interpreter needs to
learn about the person’s life. Yet it is by understanding a person’s narrative that the
interpreter comes to learn about the person. Furthermore, interpretation involves
constant movement between these two facets, for it is always open to revision and
supplementation. Since the life of the language and the life of the person form an
infinite horizon, perfect understanding is an ideal which is always approximated but never attained.

For this study, the point of narrative is the democratic negotiation, the communal understanding of how meaning gets made by each individual (Clifford, 1997, p. 166; Connelly & Clandinin, 1988, pp. 24, 74f.; Marsh, 1992, p. 130; Witherell & Noddings, 1991, pp. 113, 173). In the process, narrative offers an epistemological framework, a model for understanding, a paradigm for teaching and learning (Witherell & Noddings, 1991, pp. 153, 251). In particular, it is a model for contesting inequities and propounding change (cf. McLaughlin & Tierney, 1993, passim), for the negotiation and the development of appropriate curriculum for gifted students.

Critical theory: a philosophical framework for curriculum reform

In theory, there is no difference between theory and practice. In practice, ....

Critical theory is an excellent springboard for critical and reflective thinking concerning curriculum issues for several reasons. Many approaches to curriculum reflect a “technicist” approach. More generally, Habermas (1979) suggested that modern capitalism brought with it a rise of technology and bureaucracy, and a dominance of science, all of which encroach on the domain of social life. The paradigm of scientific epistemology tends to cut short the possibility of raising questions about ‘the good life’, about social norms and values. In response, those who seek a suitable framework for an educational theory and practice which is socially just have had to look elsewhere, and some (Cornbleth, 1990; Sturman, 1989) have found it in critical theory and have applied it in curriculum theory.
For Habermas (1972), the central problem is the relationship between theory and practice, or the connection between knowledge and social action. The central concept is *die Interessen* (interests), which admits of technical, practical and emancipatory interests. Just as we produce and reproduce ourselves through work, so do we determine and shape ourselves through language and communication. The goal here is undistorted communication which "requires the existence of social institutions which are free from domination" (Lakomski, 1988, p. 56). But the most pertinent aspect for education comes from the emancipatory cognitive interest, because education aims to be ‘interested’ in just this way (Lakomski, 1988, p. 56).

In self-reflection knowledge for the sake of knowledge attains congruence with the interest in autonomy and responsibility. The emancipatory cognitive interest aims at the pursuit of reflection as such (Habermas, 1972, p. 314).

That is, this interest forms the epistemological basis for Habermas’ concept of critique, which is claimed to be the function of the critical social sciences.

There are some worries with critical theory.

For, although we have transformed nature, developed social systems and constructed a science, it does not mean that we have done so because of transcendental interests. This is due largely to the way critical theory is grounded in epistemology, and Habermas has also attempted to ground critical theory in a theory of language (Habermas, 1979; Lakomski, 1988). I would claim that the lacuna arises because there is also a need to ground critical theory in ontology (*exempli gratia*, Bonhoeffer, 1976).

Again, it is accepted that critical theory indeed says (at least) something about social change, the kind of social change demanded by Cavanagh et alia (1991). Lakomski (1988, p. 58) summarises the practical characteristics of a procedural model of
negotiation arising from critical theory. Because of existing power differentials in society, which is itself a contestable proposition, not everyone can participate in a given negotiation. When a practical agreement has been reached, it is not possible to tell if there really is a consensus. Consensus is couched in language which is itself a vehicle for ideology. Therefore, what is termed “the ideal speech situation” is in fact unrealisable.

We cannot even achieve what self-reflection and the emancipatory interest promised us: the liberation from dogmatic attitudes (Lakomski, 1988, p. 58).

For critical theory to work, we need to assume an inclusive situation in which power and control are equalised. In championing those who are oppressed, excluded and disenfranchised, we need to attend to affect, to emotion, feeling, sympathy and compassion, in order to alleviate suffering and to realise social justice.

An educationalist who has used critical theory specifically for curriculum development is Cornbleth (1990). The prevailing product conception of curriculum as simply a document is seen by her to be one aspect of the context that shapes curriculum practice. For she conceives curriculum to be what actually occurs in school classrooms, which is an on-going social process comprising the interactions of teachers, students, knowledge, and milieu (Cornbleth, 1990, p. 5).

Therefore, for Cornbleth, curriculum is contextually shaped (cf. Schwab, 1969). The relevant context is both socio-cultural and structural. Structural context can be considered at several levels, from the individual classroom to the school organisation to the state or national educational system (Cornbleth, 1990, pp. 28ff.). Socio-cultural context includes demographic, social, political and economic conditions, traditions and ideologies, and events that actually or potentially influence curriculum (Cornbleth, 1990, pp. 31ff.).
By focusing on what knowledge and learning opportunities actually are made available to students, how they are created, and what values they reflect and sustain, “curriculum emerges from the dynamic interaction of action, reflection, and setting” (Cornbleth, 1990, p. 7). That is, Cornbleth offers a critical alternative that “highlights the continuing social construction and reconstruction of curriculum in classroom practice – curriculum as a contextualised social process” (Cornbleth, 1990, p. 8; cf. pp. 12-41, 202).

Since the focus is on curriculum practice and context, for Cornbleth, changing curriculum practice requires compatible contextual change.

Planning would be planning for curriculum change, that is, identifying or creating the conditions necessary to support the desired curriculum practice and the means of bringing about those conditions (Cornbleth, 1990, p. 178).

An important aspect of contextualised curriculum planning is creating the necessary supporting conditions or context. Without complementary contextual change, plans for reformed curriculum practice are likely to remain unrealised (Cornbleth, 1990, pp. 178f.).

Description of the study design

The students who were identified to participate in this study come from a small, isolated, rural, comprehensive high school in an economically depressed area. The ethos of their community and their school is examined in a sketch of Our Town and The High School in “The Milieu”. The students were identified either by having accelerated in at least one HSC or core subject, or by having achieved outstanding academic success, for example, dux of the school.
Permission to carry out the study

In order to carry out this research project, I obtained consent from: the Principal of The High School; the Director of Strategic Research for the NSW Department of Education and Training; the Human Ethics Committee of Northern Territory University; and eight participants, five of whom are adults, and, in three cases, also from their parents.

I have talked at length with my Principal about the nature of my research, and he indicated that he was very keen for the research project to go ahead and is keenly anticipating the results and recommendations which will come from it. Regularly, I have kept him informed about the progress of the study.

Prior to approval being granted by NTU HEC and the NSW Department of Education, I had already spoken informally about my research with each of the intended participants. Subsequent to approval being granted, I spoke again with each intended participant. Because there were proposed to be only nine participants in this study, I had time to discuss with each one the nature of my research and the results to date, and what this research project entailed. Each participant was given a copy of the Plain Language Statement (see Appendix), was given time to read and to think about it, and was given opportunities to discuss this with me.

Each participant was then invited to participate in the research project, and was asked to carefully read the Consent Form (see Appendix), and to sign it before being interviewed. I discussed the nature of the research and this study with the three participants who are minors and with their parents. The parents were asked to discuss the study with their child, to carefully read the consent form, and to sign the consent form only if their child had expressed a willingness to be involved in the study.
Possible difficulties foreseen

Possible discomfort may have arisen from sitting and talking to me for an hour or so. For some of the participants, there may have been discomfort from reliving painful and hurtful educational experiences. There were breaks during each interview, and refreshments were provided.

Some questions may have unwittingly caused embarrassment or intruded on the person's privacy. As I knew the intended participants very well, every effort was made to avoid embarrassment and to limit any invasion of privacy. However, some interview questions may have touched upon family life and circumstances.

Risks to the three younger participants were considered to be small. If needed, there was, and is, a counsellor at the school. However, I believed that the services of a counsellor were most unlikely, as I have been working very closely with each of the intended participants over a long period of time and have built up a relationship of trust and understanding with each of them. As well as this, I have regular contact with the caregivers of the younger participants, and they are able to give their child support.

It should be emphasised that, during preliminary discussions about the proposed research project, the intended participants indicated a keen interest in being involved. They expressed a strong desire to share their educational stories so that other gifted students might benefit from their experiences.

Participants were reminded that they had the right to withdraw from the study at any time. In the event, during the preliminary stages of the interviews, one of the nine people identified for the study asked that she not be included. She felt that reflecting on her negative experiences would be too painful and would cause too much distress.
The form of the interviews

It is openly acknowledged that I am personally acquainted with each participant in this study. I have taught each of them, in most cases on a one-to-one basis. I have acted as their mentor, and am proud to be called a close friend and to have privileged access to the homes of most of them. It was imperative, therefore, to ensure that potential problems of subjectivity in the research were overcome.

To this end, I followed the guidelines for trustworthiness and respect for persons in case study research that are proposed by Bassey (1999, pp. 65-91). In order to reduce the risk of response bias in favour of my own predilections, interviews were conducted on a formal basis (Stenhouse, 1988, p. 51), but without the constraints of time pressure, and were recorded on an audiotape. The audiotapes were then used to write a verbatim transcription of the interview, before a paraphrase was made, from which the case study was developed. Each participant was then given the opportunity to take issue with the way the case study had developed, and the way in which it was interpreted.

Each interview followed a semi-structured format. This allowed me to remain aloof, and allowed each participant to speak for themself. Questions were adapted to the situation as it developed, but followed the interview schedule, which is included below. The emphasis was not on asking questions, but rather on giving the participant the guided opportunity to tell their educational story, and on “listening intently to the answers” (Bassey, 1999, pp. 81f.).

Interview procedures

Participants were interviewed. Each interview took between one to two hours, and was recorded on audiotape. Interviews were conducted at a time and at a place
which was most convenient for each participant. The school students were interviewed during free periods, during a weekend, and during a school vacation. The place for each interview was mutually chosen so that the participant would feel most comfortable in the situation. One interview took place via the Internet. All other interviews were conducted in a comfortable, well-ventilated room or outdoors under a tree, according to the wishes of each person involved and the weather conditions on the day.

*Interview schedule*

Each participant was asked to relate their story concerning each of the following:

1. Their knowledge about each of their paternal and maternal grandparents, including occupation, level of education, number of books owned; the formative influence each of these people had on their life and education.

2. Their knowledge about their parents, including occupation, level of education, number of books owned; the formative influence each of their parents had on their life and education.

3. Their early development, including childhood diseases, occurrence of allergies or asthma, age at which they began to talk and read, pre-school educational experiences.

4. Their infants and primary school educational experiences.

5. Their high school educational experiences.

6. Their thoughts on the specific issues of: Vertical Semester Organisation; academic acceleration (for example, grade skipping, compression of courses, and acceleration in one or more courses); high-level conceptually demanding courses; tertiary level courses while still at school; the needs of academically and
intelligently gifted students; the nature of an appropriate curriculum for gifted students; how their educational experiences could have been improved.

Privacy, confidentiality, and security

Each participant chose a pseudonym, which is being used throughout this study. Audiotapes were marked only with the pseudonym of the participant, and none of the questions and answers identify the participant or other people involved in the study. Transcripts, and the case studies which were developed from the interviews, contain the pseudonym of the participant, and do not contain direct references which identify the participant or other people involved in the study.

Audiotapes and transcripts will be kept in a secure storage facility designated by the Faculty of Science, Information Technology and Education, and complying with the NTU Human Ethics Policy. A cross reference of participants’ names and their pseudonyms has been compiled, and will be kept in this secure place, but separate from the other body of data (cf. Stenhouse, 1988, p. 53).

Post interview procedures

There was a follow up meeting with each participant, which, because I am on personal terms with each proposed participant and their family, took the form of a morning or afternoon tea, a lunch, or an evening meal. During this meeting, it was ensured that no participant felt upset or threatened by the procedures involved and that each participant was comfortable with the case study which has been developed from their interview. I also took this opportunity to clarify some details from the interview, and to develop with the person their theses which arise naturally from their case study.
Later, when data needed to be cross checked or expanded, further details were obtained from the person who was interviewed and from their parents, and from written material in the form of school records, personal diaries, correspondence, school counsellor reports and child psychiatrist reports.

Since the interview, each participant, if they wish, has had access to their tape, a copy of their transcript, and a copy of the case study arising from their interview. They have been invited to read my thesis when it is completed. I will also inform participants about any papers that are published as a result of this study, and make available any correspondence with state and federal departments of education which arises from this study (cf. Stenhouse, 1988, p. 53).

At this time, too, participants were reminded that they have the right and the freedom to withdraw from the study at any time if they felt upset or threatened by the procedures involved, or if they were uncomfortable with the case study which was developed from their interview.

In the event of the death of a participant, their parents will be asked how they would like the audiotape and transcript of their child's interview to be dealt with.

*The dissemination and use of results of the study*

The participants in this study unanimously expressed the desire to help to improve the education of gifted students, and would like to see the positive outcomes for curriculum, which arise from their case studies and their theses, applied in other schools. Therefore, as well as forming an integral part of the practical component of this thesis, the results will be sent to the NSW Department of Education and Training, the NSW Board of Studies, and the Higher Education Division of the
Department of Education, Training and Youth Affairs, and may be published in education journals.

Significance of the study

There are very few Australian examples of research concerning the education of gifted students who have academically accelerated. One excellent study is that of Gross (1993), who has developed case studies of students identified as "exceptionally gifted" (that is, with IQ above 160), detailing their needs and educational experiences. She discusses only some aspects of acceleration, and mentions, in passing, access to tertiary courses while still at school. However, case studies of gifted students, which focus on these issues, have not been developed before in Australia (Gross, 1999, personal communication).

There are two American studies on academic acceleration in rural school settings (Howley, 1989; Jones & Southern, 1992). Again, however, case studies of gifted students at school in a rural or isolated setting have not been developed before in Australia (Gross, 1999, personal communication).

The NSW Board of Studies proposes to introduce Stage Seven Extension Courses, which will enable gifted students to access tertiary courses while they are still at school (Stanley, 2000, personal communication). Also, DETYA is currently conducting an examination of the different arrangements that allow secondary students to gain university credit while still at school (McDonald, 2001, personal communication). There are some American studies on Advanced Placement courses and Early Entrance to College, particularly the Study of Mathematically Precocious Youth (Benbow & Stanley, 1983; cf. Benbow, 1991; Benbow & Lubinski, 1997; Stanley, 1993). Start (1984) contains two descriptive papers concerning a
programme of academic acceleration at the University High School, University of Melbourne. As there are no actual Australian studies on the important issue of tertiary access while still at school (Stanley, 2000, personal communication; Gross, 1999, personal communication), this study is indeed timely.

Furthermore, it must be emphasised that, even though most people do not perceive gifted students to be disadvantaged, it is quite possible that gifted students indeed constitute the most disadvantaged educational group, “for they generally have not received sufficient stimulation to achieve their full potential” (Braggett, 1985, p. 5, p. 259). This disadvantage would be addressed by developing and implementing appropriate curricula for gifted students. The nature of an appropriate curriculum for a gifted student is explored in each case study.

**Expected results, contribution to knowledge, and applications of findings**

Preliminary conversations with the proposed participants indicated that each of them had important insights to contribute to the education of gifted students, especially pertaining to relevant and appropriate curriculum for gifted students. From these conversations, it was expected that the case studies would raise deep issues concerning greater flexibility of school organisation, access, through academic acceleration, to courses of a more intellectually demanding nature, and the possibility of completing appropriate tertiary level courses as part of their senior high school curriculum.

Because the participants are of high intellectual ability, it was also expected that the case studies would draw attention to several curriculum issues that had not been anticipated. Indeed, I suspected that some of them would have some surprising things to say about the education of gifted students.
It was also expected that the intended study would have system wide implications and implementation potential. For The High School, it was expected that this study would report on current practices and propose ways to improve the curriculum for gifted students. Both DETYA and the NSW Board of Studies have expressed an interest in arrangements which would allow secondary students to gain university credit while still at school. It was expected that this study would inform these bodies of a working model for academic acceleration which facilitates access to tertiary courses while still at school, and would draw attention to problems that need to be addressed in the implementation of such programmes.
The Case Studies

Der Abgrund und das Weltenlicht,

Zeitnot und Ewigkeitsbegier,

Vision, Ereignis und Gedicht:

Zwiesprache wars und ists mit dir.

(M. Buber, Zwiesprache.)

(The abyss and the light of the world, the need for time and the craving for eternity, vision, event and poetry: was and is dialogue with you.)
The Case Studies

Of the nine people identified to take part in this study, I interviewed eight. Interviews were generally conducted in their homes, or, rather, on the verandah of their homes, overlooking spectacular scenery and with only the noise of birds in the background. Because of his peripatetic nature, the interview with Albert, the subject of case study two, was conducted via the Internet, and his responses were composed while he was in Switzerland and the Dominican Republic.

The eight case studies were formed from the interviews. When details needed to be checked or expanded, this was done in follow-up conversations with the person interviewed, in conversations with parents, by accessing school records, and by reading personal diaries. Two of the people interviewed also very kindly gave me access to their school counsellor reports, their child psychiatrist reports, and related correspondence and documents.

When each case study was completed, a further meeting was arranged, during which the nature of their case study, and the import, the message and the significance, of their story were discussed with the participant. Together, each participant and I then developed the particular theses which form an integral component of their case study.

The case studies are presented in a time sequence, from the oldest person to the youngest, from the first, who completed her schooling the earliest, to those who have just completed Year Nine at The High School. In this sense, then, the case studies form a longitudinal study encompassing sixteen years of secondary schooling. This also implies that the development and implementation of the curriculum initiatives central to the study will be continuing for at least several years to come.
I briefly mention the ninth person who was identified for this study. Her case study would have been placed between Albert and Elise. She was identified for this study because: she academically accelerated her studies by one year; she attained 100% in an HSC language examination; and she was Dux of The High School. As mentioned above (vide supra, p. 79), during the process of interviews she asked not to be included in the study. She felt that reflecting on her negative experiences would be too painful and would cause too much distress. Such experiences remind us that it is imperative that schools develop better structures and set in place better procedures to remove verbal abuse and prevent ostracism, in particular, that which is inflicted on gifted students by others at school.

Due to the close working relationship I have enjoyed with each participant in this study, much of their story was already known to me before each interview. However, as will be evident as the case studies unfold, it is important to get to know each of them from their perspective, and so their story is told with that imperative very much in mind. The relevance and importance of what they have to say concerning the education of gifted students cannot be emphasised enough.
Case study one - Jane

Jane was born in May 1973. She was identified for this study because, eleven years ago, she completed her Higher School Certificate, attained the highest university entrance score of any student to have attended The High School, and was Dux of The High School. She has since graduated with a first class honours degree in Science, and is now putting the finishing touches to her doctoral dissertation. She is the younger of two daughters. When interviewed, she was visiting her parents with her fiancé who is a computer scientist. I visited her in the house where she grew up. It is situated on the side of a ridge at the edge of the village, and has a beautiful garden and a peaceful view over open farmland. Jane has bright blue eyes, dimples when she smiles, a quick and ready wit, and a gentle sense of humour. She enjoys Rogaining, the sport of long distance, cross country navigation.

Grandparents

Jane’s paternal grandfather was a self-educated civil engineer. He had a strong belief that his own children should go to university, and set aside money in his will for his grandchildren also to be university educated. He died when Jane was in infants school, and a lot of his books are still in the family.

Jane remembers her paternal grandmother as a wonderful person. “She was very vibrant and vivacious and liked to have a bit of a laugh.” She was the daughter of a bank manager, and then the wife of a civil engineer, but never had her own career. She always wished that she had done something with her life, and always encouraged her grand-daughters to get out and do things. She was an avid reader until she died about seven years ago.
Jane’s maternal grandfather was a cane farmer on the north coast of NSW. He is remembered as a passive person, and did not enjoy good health when Jane knew him.

Jane’s maternal grandmother was a primary school teacher. At about the age of forty, she had to give up her job when she developed manic depression. “She was an avid reader and liked to keep her mind active, but all the time I knew her, she was either depressed or high and she was quite uncontrolled. I guess she was unlucky. You know, the timing … . Her life was very unfortunate in that they just started being able to treat that sort of thing but not terribly well.” She has dementia now, but still vividly remembers the time when she was a school teacher.

**Family**

When asked about her father, Jane responds with long fits of laughter. Jane’s father grew up in Tamworth. He completed a Science degree and a Diploma of Education at the University of New England. Since then he has been a school teacher. He has always been very interested in politics and current affairs, and loves discussing and debating issues. His sense of humour could be described as “bad” and “embarrassing”. However, “he is a very compassionate person, and he loves life, and a lot of the time he is over-the-top, with lots of energy, but he does have the reverse as well.” He likes to read, mainly on holidays, and keeps up to date in professional reading, advances in science, and developments in information technology.

Jane’s mother grew up on a cane farm, and attended a one-teacher school before moving away from home to complete her secondary schooling. She completed an honours degree in Arts at the University of New England before qualifying with a Diploma of Education. Apart from time off to raise two daughters, she has been a teacher ever since. She is actively involved in teacher politics and the Teachers
Federation. She is very widely read, and is deeply reflective. She, too, suffers from manic depression.

Jane’s parents met at Teachers College, and taught in several towns in country NSW before settling in Our Town. “I would like to live parts of my life the way my mum and dad have. You see things that you admire and that you appreciated as you were growing up. I think that, along with all the down side of depression, I’ve got a lot of different qualities that probably come along with that. I suppose being reasonably intelligent, being fairly conscientious, and bordering on obsessive-compulsive disorder, are personality traits that come along with it.”

Jane’s sister is two years older than she is. “She is really, really bright. She is sort of the bright one. But our personalities are very different. She hated studying, whereas I saw it as almost an obligation. She pulled out a really good HSC mark with just a huge flurry of studying right at the end, and hardly any work. She’s always been like that and everything is like that with her. Whereas I agonise over something for ages and spend way too much time on things. We fought like cats and dogs. The distance is good now. It’s amazing how a couple of thousand kilometres between you makes you like each other.” She is a science teacher, and was recently appointed to the position of Head Teacher.

Early development

Her mother’s pregnancy with Jane, and Jane’s early childhood development, were relatively uneventful. Asthma, associated with exercise, has only recently been diagnosed. Common childhood diseases occurred when Jane was three. As it happened, she had chicken pox at the same time as her mother, and that is how she came to learn to read while going to preschool. After preschool, the family moved to
Our Town, where Jane immediately started Kindergarten. Infants school and primary school are best remembered for their positive social aspects. "I used to read heaps. I loved reading. I would read wherever I could, in the car or in the loo, or wherever. I never found school to be a hassle. It was pretty easy. I remember the one thing I couldn't do was to whiz through my times tables really fast. It really stands out. I used to stumble over my words. Clumsy mouth I think I've got. I read books which were appropriate to my age. I was reading lots of Judy Blume, and Sweet Valley High, and all that sort of stuff.

"When I was in Year Six, they had to make a composite class, which covered the entire four years of primary school. It was largely third and fourth class, and then a couple from sixth class. There was me and another girl and then three boys. They chose us to be the people who could work on their own. I remember starting it, and then not wanting to be in it. You were immediately isolated from the rest of your year, and people called us 'The Smart Arse Class'. What we were doing in there was pretty pointless anyway. We weren't really being supervised at all. We just copied from each other, and didn't think much for the whole year. We did lots of projects. We had a certain amount of sums to do from the sums book, and then we had a diary we had to write, and then we could play or use the computer. I did the maths and my friend did the diary, and then we would swap and copy, and the teacher didn't even notice. It also meant that going into Year Seven we had had a whole year away from our class mates."

**High School**

Transition to The High School went well. Throughout high school, Jane followed a traditional curriculum. The need to accelerate her studies, especially in Mathematics, was felt, but it was not even considered to be an option. "I noticed that I was
excelling academically in year nine. I took the exams in year nine seriously, and studied really hard for them. That’s also when I first noticed that it was difficult to do some things. I was a bit of an all-rounder. I was good at English, Maths and Science. I found essay writing hard. With Maths, I could have been accelerated a year. I remember sitting in maths classes and finishing all the examples we had to do way ahead of everyone else. But there definitely wasn’t an opportunity to accelerate.”

**Senior High School**

“I hated senior high school. I became quite depressed from the start of year eleven. I had grown up with mum and dad teaching senior students, and always being down at the beach on holidays when the HSC marks came out. Mum and dad would always race to the phone booth and find out how their students had gone. It was this thing that I had picked up from that, that it was good to do well in the HSC, and I wanted to. My sister had not studied too hard and had been quite disappointed because she got 399. I thought to myself, I’m not going to do that. So I made it a really big thing. And as a result of that I think I got depressed. I withdrew socially, and put a lot of my energy into studying. Being depressed made me withdrawn and unable to talk to people, and I was really conscious of that and knew it was a bad thing. But I knew there was something that I could do really well. So that’s what I did. I did lots and lots of study. At the time I thought it was just associated with doing the HSC and being in that set of circumstances with people from school. It took until I was 22 to realise that it was really manic depression. At the time, I was totally aware of the family history. You can see how someone is behaving from the outside, but when it happens to you it feels totally different from what you would expect. So (at school) I didn’t think that it was depression.

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"I had a couple of really good friends. They were maybe a little bit quieter, and a little bit off the beaten path. They accepted people who were maybe a little bit different. They liked to talk about issues, and they would read the paper, and think a little bit more. There were three of us who formed a little bunch. The negative experiences probably stemmed from a lot of different things. Having parents who teach at the same school, doing well at school, studying a lot, and appearing as though you didn’t want to talk to people because you didn’t feel like you could talk to them, all created a lot of problems. There was one incident in class, when somebody said something, and I think that was the last straw, but I don’t really remember what it was.

"I didn’t find 3 unit Maths hard at all, whereas 4 unit Maths was a whole lot more challenging. It was the one subject I didn’t actually cover everything for. I found the 3 unit Economics really interesting. I had a great teacher, and he chose options for us to do which were quite interesting. The Eastern Bloc collapsed and we did a whole unit on the economics of that, and we did environmental economics, the sorts of things which made it really interesting."

For her HSC, Jane completed 4 unit Mathematics, 3 unit Economics, 3 unit Related English and 2 unit Physics. "I didn’t know what I wanted to do when I left school, and so I wanted to keep my options open. I started doing Chemistry, and I was very conscious of wanting to have a good mark, and there have been problems with Chemistry marks (at The High School), and the first few lessons I wasn’t very happy with, so I gave that up. That wasn’t really a problem. I’ve done a Science degree, and there are bridging courses which cover it quite satisfactorily."

"For my HSC I got 99.25 (with a score over 430), and 100% in 3 unit Mathematics. I was very, very happy." The details are now hazy in her memory. She was dux of
The High School, and received an award from the NSW Minister for Education, in recognition of her academic achievement and her participation in the community. “That was a really nice pat on the back.”

The academic aspect of the award was obvious. The community part of the award arose from a quiet and steadfast involvement in ballet. Jane started ballet lessons when she was five, and ballet was a big part of her life all through school. It was her fun and her relaxation, her outlet and her way of expressing many emotions. She travelled 90 kilometres for lessons, which were on weekends and one or two nights each week. She learnt classical and jazz ballet, and enjoyed competing in eisteddfods. “I enjoyed the discipline of classical ballet, and the control you have to have to do it.”

Tertiary studies

During Year Twelve, when she was thinking about university and a career, her mathematics teacher talked with her about actuarial studies. She had heard of it before, but this did spark her interest in it as her first choice. “The reason why I wanted to do that was because I was really good at maths and enjoyed economics as well, and it seemed like a really good mix, and they were offering me a really good scholarship. I did a year of actuarial studies. I don’t think I could really regret anything I could have done that year, because I think I needed a couple of years to actually get myself together. I think when depression hits anybody, it’s a very difficult thing to deal with. But when you are just forming your personality, and when it is a time when it is really important to have lots and lots of friends and social contact to develop that side of your life, then it is even harder. So I just needed to learn how to be a person for a while. I didn’t go on with actuarial studies. I got
depressed again as soon as I had to have exams again, so I finished at the end of first year, and I took a year off.

"I did a Science degree, majoring in physiology, with honours. Then I went on to do a Ph. D. which I am finishing now. It is on the development of the kidney before birth in late gestation, and how that is affected by hormones related to nutrition and by nutrition itself. I've looked at how a growth factor called 'insulin-like growth factor 1' affects renal growth in late gestation. Given foetal sheep, which is the model being used, infusion of insulin-like growth factor 1 for a bit over a week, and they get really good kidneys and they also show signs that their kidneys are actually functioning as a normal mature kidney than what they normally would at that time of gestation. And insulin-like growth factor 1 is a hormone that is associated with nutrition. If you've got a high nutritional plain then you will have higher levels of RGF1. So it is just one step towards looking at how factors like that control renal development.

"It's pretty demanding doing a Ph. D. and some times too much so. But it is very, very interesting. It is a lot of hard and mundane work, especially doing all of the experiments, but when you go to writing about it, it can be really interesting putting all the pieces together and working out what it all means and how it fits in with everything else."

**Jane's reflections on education**

Jane believes that her school education could have been improved. "Academically, maybe doing harder maths and extended a little bit more with maths. But as far as everything else went, I think it was at the appropriate level." Support should have been afforded or offered during times of depression. "That's a really hard one,
because ... if it could be recognised from the outside then I think that would be a
good thing, but I think it would have been a bit difficult for people to know what it
was. Mum had seen her mother crying on her bed not wanting to get up out of bed,
and that was very different to how I was behaving. It didn’t seem like depression at
all. It’s got lots and lots of guises. If it could be recognised .... The other thing is
you’re dealing with an adolescent who often doesn’t want people to know they’ve
got problems, yeah, and who is up and down all the time, so it is all very mucky.”

In general, Jane believes that gifted students need more opportunities, and a more
conceptually difficult framework for their courses. “I think if things are made
available for people to use if they want them - a book club, or a discussion group.
The one thing you don’t really get when you go through school or undergrad
university, until you start doing research and realise that people don’t actually know
the way things work, especially in science, but all the way through, even in my
undergrad degree, a lecturer would say this is how it works, and you would write that
down and that is what happens, and when you start doing research you realise that
everything is quite grey and not black and white. Maybe giving them an awareness
of that, because it is a really difficult thing to come to terms with it. It is so much
easier to learn it if you can see them just as facts. And it makes it all a lot more
confusing and complicated when it is shown to you in shades of grey. But that might
be something that is valuable to show to people.”

Most importantly, Jane believes that gifted students need social support and support
in the form of more resources. “If it is not direct support, then at least keeping an
eye on how they are getting on with other kids at school. I think that is a major one.
And making sure that they have all the resources available to them that they need to
do what they can do.”
**Acceleration**

"I think (acceleration and early entrance to tertiary courses) is a really good idea. Being made aware that university is so different is a good thing. I don’t know how you do that.

"Acceleration could be really, really good for a student, but it needs to be offered in a way that they can turn it down if they don’t want it. You need to be very aware of people’s social needs as well as their academic needs. For the appropriate person, tertiary courses (while still at school) would be a really good idea, but, one of the other things which is hard to do is making the transition from being in a high school where teachers are available to help you and get quite good one-on-one attention, to being at uni where it is really hard to even track a tutor down and make them stay in one spot long enough to answer you. Maybe introducing the tertiary courses with a lot of back-up and support is good.

"I think the federal government should pay the HECS fees (for tertiary courses while still at school), because if they are really serious about having a clever country and advancing their population’s intellectual growth, then they should pay for it. And I’m not sure that the amount of HECS that is charged actually amounts to how much it costs to run the course, so if the federal government were to pay it, then that would cut out the middle-man."

**Rural students**

Jane is adamant that more opportunities need to be given to gifted students who live in the country. “One of the disadvantages of living in the country is, if you are living in the city you have access to resources, like you can go to a research laboratory for work experience and see how they work, and you would have friends who have a
wide range of professional jobs, and you have an understanding of what people do. I had absolutely no idea of what anybody did, apart from being a school teacher. It would be really valuable to be able to actually have a much better idea of what they do. Or even an idea of what you do at uni. If you live in Sydney, HSC courses are available in the holidays, and going to see the plays for your HSC is so easy to do. Going to the university libraries and having a look around and seeing what they’ve got there, the research journals and everything that’s on offer there, is something you can do if you live in the city.”

Jane’s theses

1. A significant number of students are not challenged in Mathematics until they meet Extension 2 (4 unit) Mathematics in Year Twelve.

2. Gifted students need appropriate support for their social and emotional development.

3. Gifted students who suffer from mental or psychological disorders need to be recognised and given appropriate support.

4. Access to acceleration and tertiary courses is valuable, and gifted students choosing these options need appropriate support.

5. Gifted students need access to appropriate Work Experience programmes.

6. Gifted students who live in country, rural or isolated areas are especially in need of support and access to resources that metropolitan or less isolated students enjoy.
Case study two - Albert

Albert was born in January 1977. He was identified for this study for four reasons: he excelled academically at a national level; he expressed a desire to accelerate his schooling but was not allowed to do so; he was Dux of The High School; and for six years I worked very closely with him. He is the youngest of four children. While at high school, he lived in a small, timber cabin, set in picturesque ironbark woodland on a ridge, a couple of kilometres from the village of Our Town. It has a twelve volt electrical system, and a cast iron, slow combustion stove. The kettle is always on for a cup of tea. Albert has thick, curly, black hair, a swarthy complexion, and an outgoing, rather expansive personality. He has an athletic build, and enjoys snowboarding and kiteboarding, especially in exotic climes.

Grandparents

"I know almost nothing about any of my grandparents. My paternal grandfather my father liked despite running away from home at the age of about thirteen from a pretty sad family situation. I know he liked his wine, and when I met him the one and only time he was dying and basically no communication was made possible anyway due to language barriers.

"My paternal grandmother left my grandfather when my dad was three or four. She was quite insane and my dad’s main memory of her was being held out of a multi-storey building by his foot at about three years old threatening to drop him. My father’s step-mother La grosse Potat was a large motherly figure whom I’ve met once briefly. Indirectly what I know of her was pretty negative, hence my father running away from home at such a young age."
“My maternal grandfather I knew a little. He owned and managed a factory in Switzerland. He was a very strict and straight man, very Suisse, and had a great memory for dates, places and objects he’d encountered. He loved bridge and played well; he read occasionally, though I’ve no idea what or how often.

“My maternal grandmother is a complete mystery to me. She died before I was born. Nothing I’ve heard about her has left any impression on me one way or the other.”

Albert’s family

“My mum is Swiss. She was the only child of a well-off, middle class family of immigrants or refugees from who knows where. She attended the Gymnasium (academic high school), repeated a year towards the end, but did quite well, especially in languages. She did not attend university, but, at the age of thirty eight, she began studying Chinese medicine and Acupuncture.

“My dad was brought up first in Morocco and came from quite a poor background, living with various relatives when times were hard. His first language was Spanish until about five, and he then went to a French speaking school. The family then moved to France, and after having too many troubles with them, and after some attempts at running away, finally ended up in Israel in a youth programme. There they tried to put him into an accelerated learning school as they thought that he had a lot of talent. He wasn’t ready to settle down yet (at the age of 13 or 14), so he went on his own way. He found work as a manual labourer and as an artist until he met my mum.

“My parents met on the beach in Israel. My dad was doing some mock impersonation of Einstein as a joke, which is pretty funny as my mum is actually related to him. They started going out immediately, and were married in Israel with
no family present. They lived for a while in Israel, then moved to Switzerland where they had their first child. Dad stayed home with the baby and mum worked as a secretary and translator.

"They then travelled to Melbourne to become Australian, as it seemed like a very nice place to live, although neither of them had ever been there. After living in Melbourne and having a second child, they became tired of that city and returned to Switzerland, where a third child was born. They then returned to Australia, and travelled up and down the east coast in a beat-up old campervan and with three kids, picking everything from tobacco to grapes, until they found the sapphire gem fields. There they started mining with pick and shovel, lived in a tent, and I was born. They developed a heat treatment process for sapphires which is now second to none in the world. This was done inside a large piece of hessian strung between four gum trees, and, when it started to work well, was defended at night time with a shot gun. Until about 15 years ago, the gun was still the law there. Later, my parents built a humble abode a little more protective than a tent, and my dad still lives there.

"When I was about two and a half, my parents were having lots of troubles, and finally my mum left with me and one of my brothers and moved to Nimbin. She had heard about an alternative school there, which in fact turned out to be quite shite (sic), but in any case we lived there until I was about ten. During these years, though, we travelled to Switzerland, lived in an ashram outside of Delhi, spent a few months in the mountains of India, and then returned to Switzerland for four months. "When my grandfather died, he left a small inheritance, which was used to buy our house."
Parental influence

“My father is very competitive for us, and wants us to do everything he never had the chance to do. When I topped Australia with 100% in a national mathematics competition, his reaction was, ‘You could still have done better’. He is a very logical thinker and taught us to be like that. He will pull any machine or video or computer apart and fix it, which rubbed off on all of us kids. He likes inventing new things and gets a kick out of making something new, whether it be a new game he wrote on the computer or a kerosene burning shower head hot water system when he was living in the tent next to the dry river bed. He also has a strong survival instinct, which he wanted and encouraged us all to have. He has a ‘don’t take shit from anyone’ attitude, and definitely a ‘go out there and get it’ mentality. He is also a philosopher, though his attitude makes it hard to actually discuss things or disagree with him on any point. He loves to read, and wishes some day to write a book. If he could go back to study, it would be anthropology. He has an amazing memory for geography and history.

“My mum is in many ways completely different. She believes there is so much more to life than fighting for survival, and will very happily live in the house on the hill away from problems and the people who may want to create them. She is a very earthy and spiritual person. From the age of four, we would spend hours upon hours talking philosophy and listening to classical music. I remember, at the age of six, being explained the basics of quantum physics as mum was reading the dancing Wu Li masters. Not too much to get confused, but enough to understand the basics. And along with the warning not to talk about this with your friends at school, as they might not understand and might think you a little crazy. On the other hand, she would take us out of school once a week, because she didn’t want our lives to be run
by the school. When I did my best ever maths result at school, her response, unlike dad’s, was, “That’s really great, but don’t forget that there are many other things more important in life than mathematics.” My mum also loves music, and encouraged me a lot when I started to play, and would just sit and listen.

“To sum it up, I guess I could say that my dad pushed me to live in the real world, to become a winner, pushed me at any opportunity to get ahead, and gave me more of the logic skills to work with. My mum, on the other hand, gave me an environment where I could actually do things that I wanted to do, and hands on help and support when I needed it.”

**Albert’s early development**

“Despite the ‘Copper 7’ contraceptive, my birth was normal. Except that I started to turn purple, as I wasn’t breathing due to a blocked nose. And, of course, the birthmark. The birthmark, which the doctor told my mum was nothing important, and would make me who I was going to be. I didn’t speak until I was three. I don’t remember when or how I learnt to read. It just happened naturally, I guess. At bedtime, my mum used to read *The Faraway Tree* and so on, and dad used to make up his own stories when I was there. We used to listen to classical music, and play rummy and five-hundred. I was encouraged to play memory games, because they said I had a pretty shocking memory for some things. When I was seven, I learnt to play with computers and robots in my dad’s computer workshop. I’ve hated computers and especially computer games ever since.

“Until the age of eleven, I went to different schools every three to six months, which meant that I missed out on learning how to running-write and other non-important things. But it had a huge effect on me socially, every few months having to start
from scratch. This, along with a birth mark, being pretty poor, not participating in sports because of distance and money problems, the non-religious, free-thinking upbringing, and all the travelling which no one else my age seemed to have done, all this kept me very much apart from others. At school, I was a pretty lonely kid for the most of it. Being good at school only made it worse. However, I knew that despite being such a loser to them, I was still going somewhere they never would.

"So my infants and primary schooling is quite hard to define, as it was spread, off and on, over five schools. When I was in India at the age of five, mum taught me some of the basics. Once or twice, I attended a local school, and learnt their version of the ABC, which was pretty cool in a sing-song sort of way. When we lived in Switzerland, I attended a school for foreigners. I remember getting into trouble for not aligning all my maths. Nothing changes. But I did enjoy learning German.

"Nimbin primary school was an interesting enough place, and I must have spent at least three years there, all up. Anakie public school must have been home for close to two years, off and on. It was a tiny school, with composite classes. Due to the different state systems, I kind of missed subjects in the jumping back and forth. I was at the primary school in Our Town for about one and a half years. This was the first school that I remember learning anything at all, with structured days, and academically a little interesting. I was often lonely at lunchtime, and would spend my time reading in the library. I remember thinking then that since I was having no fun at lunchtime, what a pity I couldn’t take classes all day through and either get ahead or go home early. It was a start of the time when I didn’t want to be wasting time. I wanted to be doing things I was good at or would be useful to me in the future."
"I still did OK at school, somehow, without trying. I never knew of homework until high school. During years five and six, I took part in my first mathematics competition. I remember getting a high score, which was a surprise. It gave me a bit of a buzz, and some kind of recognition, and a lot of encouragement which probably inspired me in that direction. But the real inspiration came from home. Within the family, we discussed everything from computers to religion, from ethics to acupuncture, from quantum physics to gardening. Being surrounded by people who knew so much inspired me to do the same just to keep up."

Reminiscences of a mathematics teacher

Albert is proud of the academic achievements he attained while at high school. Nevertheless, he is always very quiet about them as well, and, during the Internet discussions for his interview, he avoided talking about them at any length. He would simply say, "You know the details." Therefore, because I apparently know the details, and because I worked so closely with him throughout his secondary school career, I am able to outline some of his outstanding accomplishments.

"Albert and I started at The High School at the same time. The primary school said he was just average. He was a quiet kid, and sat by himself at the front of the class. I would set a problem each lesson, and a harder problem each week, and the response from Albert was amazing. One week, the problem was to consider the decimal number 0.123456789101112...99100101...99910001001... and to find the digit in the millionth decimal place. Within a couple of minutes, after scribbling a couple of notes on a scrap of paper, he excitedly gave me the correct answer. So, for an hour each fortnight, we met after school and developed some problem solving skills. Albert then won a prize in the Australian Mathematics Competition. It is interesting
that at the end of Year Seven, he also won the school’s public speaking competition, edging out the top senior students.

“When Albert was in Year Eight, and following his prompting, we began more intensive lessons in heuristics and advanced topics in mathematics. For the next five years, we met once a week, for two hours before school, had breakfast together, and worked. Sometimes we also met after school, or did mathematics over the telephone. He became a regular visitor to our home, where we played a lot of chess, worked on our mathematics, and read philosophy.

“By the time Albert got to Year Ten, he had pretty well mastered the non-calculus side of the senior Mathematics syllabus. He wanted to accelerate his studies, to skip Year Ten and move straight on to Year Eleven. For some unknown reason, all the head teachers had to approve this. The English boffin said, “No. He is not talented in English.” And that was that. I do not know how they came to determine that. They had obviously never heard him discuss ethics like I had, or seen what he was reading at home.

“Anyway, when he was in Year Ten, Albert scored 100% in a mathematics competition, the only student in Australia to do so. He was the only one to solve the problem of expressing \((1 + x + x^2 + \ldots + x^n)^2 - x^n\) as the product of two polynomials, \(n > 2\). He also collected a few distinctions and high distinctions in other mathematics and science competitions, and wrote an excellent paper for Mathsearch. Subsequently, he was invited to join the teams training for the Mathematics, Chemistry and Physics Olympiads.

“I found some money from various sources to send him away to the training camps. He was the only public school student at the Physics camp, and he felt very much
discriminated against. Later, there were some communication problems with his tutor, and an important examination script was not sent to him. The Mathematics and Chemistry camps were much more positive experiences, and he got a lot out of them and the follow up work.

"The kinds of problems we were working on had, of course, grown enormously in difficulty. I remember taking about an hour to prepare a geometry problem from a Russian Mathematics Olympiad paper for one of our sessions together. Albert solved the problem immediately. I got even with him by setting a number theory problem for him to work on, to prove that there are an infinite number of integer solutions to the diophantine equation $x^7 + y^8 = z^9$. This one took him a couple of hours to do. His persistence, his depth of concentration and his abstract level of thinking were awe inspiring.

"For work experience, I organised through a friend for Albert to spend a fortnight in a research laboratory within the Department of Civil Engineering at the University of Queensland. He worked on a project with post-graduate research students studying supersonic wind blasts in a wind tunnel. According to the feedback from the professor, this programme was an enormous success, for both Albert and the doctoral students. I think that, for the first time in his life, he met some intellectual peers with whom he could relate.

"When he was in Year Ten, Albert picked up a guitar for the first time, and taught himself music. Within a year, he was a competent classical guitarist, and he loved flamenco. He used to play at the home for the aged. Then, in a stroke of brilliance, he organised a concert of classical music, drawing together for the first time a diverse group of students with hidden talents. This has now become an annual tradition. In Year Eleven, he could not afford to go on the snow excursion, and instead he
organised more work experience, this time with a master instrument maker. Under
the careful guidance of the best guitar maker in Australia, Albert made his own
guitar, and it is beautiful.

"Year Twelve for Albert started with the National Science Summer School in
Canberra, for which he was sponsored by a local service club. For his HSC, Albert
studied 4 unit Mathematics, 2 unit General English, 2 unit Physics, 2 unit Chemistry
and 1 unit General Studies. He attained 100% in 3 unit Mathematics and almost that
in 4 unit Mathematics. Instead of studying for his examinations, he quietly designed
and scrounged the material for a twelve volt electrical system for a house. After his
Mathematics paper, he put this electrical system together in our house, for we had
been living without electricity for five years, and I arrived home from work to find
the best 'thankyou' a teacher could ever receive from any student. Albert's TE score
of 94.45 does not in any way reflect his level of achievement at school."

Albert's reflections on his education

"During high school, I spent as much time as possible not being at school." At the
time, there was an 85% attendance requirement. "Basically, I made sure I took my
six weeks off a year, plus a few 'half-days', usually just after roll call, or at least after
lunch. Most classes seemed like trying to stuff beef stew through a fine sieve. They
were stale, and just did my head in. I got the general idea, but couldn't seem to
remember the bulk of the boring details. It made it all feel like hard work, and I've
always been pretty lazy. From the beginning, woodwork and metalwork were my
favourite subjects, and it was sad to have to put an end to them in year eleven.

"My maths teacher in Year Seven was the first and maybe the only teacher who
made all the hard work seem like fun, and as a result I quickly excelled in that
subject. And then, as I became accustomed to doing well and as I knew that I could do well, my other classes improved considerably. It was, at least in part, a choice on my behalf: if in one subject, why not in another, and especially something like Science. To be honest, though, I still never did any work in any subject except my maths. I would often work hard in class, but never at home. Except maths. In the last few years of school, I ended up truanting classes and going to the library to do a lot of work for the classes that I was good at. Although this seemed like a good idea at the time, and was definitely better than getting bored in class and being a bit of a distraction to others, I was probably too lazy and a little bored to make the most of it.

"I took part in maths and science competitions, which fitted in neatly with the work I was doing with my maths teacher, doing extension work and challenging problems in maths. I found it a little bit exciting to be put up against people from outside my own school, as I later felt that there was little competition within it, especially for these types of problems. Even my maths teacher stopped awarding me prizes for solving the week's problem, which I took as a bit of a compliment. The Olympiads I did were great, and looking back I wish that I had pursued them further. They were an immense source of learning and pleasure, and gave me the chance to meet some truly wonderful people, and to meet other students who did not look down on me for doing well and being interested in academic pursuits. That was truly inspiring, especially coming from a small school where I personally felt that doing well was a real drawback. Like I said, the Olympiads and competitions were great in that it took away all the stigma of doing well as it wasn't a competition against my peers but against the whole state and most importantly against myself. Except for the award ceremonies, which I usually made a point of missing due to the embarrassment.
"Work experience at the uni was very rewarding, and helped in narrowing down the kinds of studies that I would be interested in at a later stage. The guitar making was of course a fantastic experience that I will always cherish, both for the musical side of it and the pleasure of working with my hands.

"There were, of course, lots of positive experiences from school, but these were mainly out of the usual curriculum. Work experience, the Olympiads, and the maths I did with my maths teacher. One of the things that I did that I enjoyed was organising the music with the school fete. I don't really recall any bad experiences. Selective memory?

"Relations with fellow students was not my strong point, and this was further stressed by the fact that I was doing well in topics that no one else would consider. At the same time, it did give me some sort of respect, though for all the uncool reasons. My close and lasting friendship with Jai, who topped Australia in a classical guitar competition, was a good influence on us both. We both had to accept where our talents were, and do the best with them.

"The curriculum was generally fine, if not sometimes too low a level in maths and the sciences. The mathematics component was developed anyway by the extra work that I did with my maths teacher. The sciences were often way too slow, but as there was no one else to really push off who was interested and able, I was generally happy to just let it lag, or give up pushing.

"The work that I did with my maths teacher was the key turning point in my education. I enjoyed the work, and he gave me the opportunity to have even more and more fun doing it, and so I did it all accordingly. Interesting problems was what got me hooked. Maths could be used to understand real life problems. Once started,
though, it was like nothing could stop me, and the benefits from one thing led to another. The breakfast maths, after school maths, the chess, and occasionally in-class work, were what kept on pushing me to concentrate deeper and strive harder. I think the one-on-one work was paramount, or the small groups like 4 unit maths. Even then, after about ten minutes it felt like my maths teacher was talking only to me. I think that his strength was that he could see how I was thinking, or not thinking and correct the problem, but maybe because I had already a warped way of thinking, he didn’t have to teach me every step, but correct those that I did wrong. Only with that one-on-one work could someone have done that.

“I think that it is fair to say that I wasted at least half my time at high school. I believe that some kind of challenge like acceleration would have done my schooling a load of good, even English, which was my worst subject. I could have easily accelerated in Mathematics, and, with a little focus, it would have been possible in my other subjects, too. I’m not really complaining, as my life is great at the moment, and who knows how things would have turned out if the situation had been different. I reckon that if the school system can be adaptable enough to allow acceleration then that should be encouraged. Why not adjust the system to suit the student a little, instead of fitting every student into the same system . . . .”

Epilegomena

Albert put himself through three years of a Science degree at the University of New South Wales, in the process holding down an almost full time job during term and working full time during vacation. After collecting a host of high distinctions, he could not decide whether to study honours in Theoretical Physics or Applied Mathematics. So he worked his way around the world, living for a while in Turkey, Switzerland, France, Spain, Portugal, a yacht on the Mediterranean, and the
Dominican Republic, picking up a couple of languages and the skills, knowledge and experience to be a cordon bleu chef. He has just enrolled to do post-graduate research at the University of Lausanne.

Albert's theses

1. Gifted students need an appropriate, high level, faster paced curriculum.

2. Acceleration is an appropriate way of meeting some of the academic needs of gifted students.

3. Appropriate, high level problem solving should be an integral component of the curriculum for gifted students. Better resources and more curriculum support throughout Years K to Twelve are needed for this.

4. Learning to play a musical instrument and learning a second language should both be an integral component of the curriculum for gifted students.

5. Gifted students need access to work experience programmes appropriate to their ability and interests.

6. Gifted students need opportunities to meet and relate to peers, and to visit universities, research facilities and libraries in large centres.

7. Gifted students need appropriate recognition for their achievements, given in a way which is sensitive to their situation.

8. Gifted students from low socio-economic backgrounds, and from isolated, rural settings, are especially in need of support. This support should enable the student to gain access to needed resources, including information technology and more advanced texts, and to experience the opportunities offered in large centres.
9. Support is needed for small, country schools to develop and implement individual programmes for gifted students, and to run high level classes with low numbers of students.
Case study three - Elise

Elise was born on 17 July 1981. She was identified for this case study for four reasons: she accelerated through her high school curriculum; she gained access to tertiary courses while still at high school; she was dux of The High School; and, for five years, we worked very closely together. She is the older of two daughters. The family home is an old weatherboard house in a quiet back street of a small village, a couple of kilometres from Our Town. It has a well-tended garden, and a backyard swimming pool. Elise is a reserved and deeply reflective person, with a heightened awareness of ethical issues and a strong moral outlook on life. Her dress sense is described by some as eccentric.

Grandparents

Elise’s maternal grandfather grew up and worked on a farm until the death of his parents. He then sold the farm and moved to the city, working in menial jobs at Monash University and studying at night. He graduated (at the same time as his two eldest sons) to become a zoologist, carrying out research on the giant Gippsland earthworm and the ant brain. He was a deeply religious man, and enjoyed discussing religion and science with others. In her early childhood, Elise spent a lot of time with her grandfather, both in the field digging up earthworms and in his study where there was a library with several hundred books. In 1998, he died after a long illness.

Elise’s maternal grandmother was a primary school teacher, and later a teacher of doll making. She enjoys needlework and repairing and collecting antique dolls. Like her husband, she is religious, but seems more reticent to talk about this with others.
Elise’s paternal grandfather was a clerk, working in the post office and later for a bank. He retired after he was shot during the Queens Street shootings. He is an avid reader, one room of his house being filled with books which Elise has been borrowing since she could read. He is also a keen photographer and has his own darkroom. Elise suspects that he is religious but that he is reluctant to talk about this openly.

Elise’s paternal grandmother is English and migrated to Australia when she was a young woman. She is very patriotic, and also openly ‘anti-religion’. Her reading centres on political writings.

**Family**

Elise’s mother was the youngest of a family of six children. She grew up in Melbourne, matriculated, and completed part of the first year of a university Science course. She then obtained part time shift work and tried to continue her university studies. “This was doing it the hard way, which didn’t work out. Every time I suffered from pre-menstrual depression or mum and dad had a fight and I got miserable, I’d just quit everything.” After one such incident, she left home, travelled to North Queensland, and learnt how to make dolls. Again she enrolled in a Science course at university, but gave it up to teach doll making which she then did for a few years. She later attended horticultural college, but did not complete that course, before transferring to teachers college and gaining qualifications to become a teacher. She has not been able to practise as a teacher due to family commitments and more recently for health reasons. Recently, due to coercion from Elise, she enrolled in a Science course at university. She is also very involved in the local community. She is agnostic, but, she says, “With strong religious leanings. Can you be religious and agnostic at the same time?” She is interested in philosophy, but
believes that it is not possible to know the answers to the big questions, and therefore avoids addressing philosophical issues. However, she does readily talk to her children about moral and ethical issues.

Elise’s father is a very practical person. As a youth he loved to make contraptions, and his main passion was, and still is, trains. He completed a degree in civil engineering, and subsequently has practised as a civil engineer, working for shire councils before setting up his own business. He does not read, unless it is about trains, and does not appear to be interested in religion or in philosophical issues.

Elise’s parents met when they were in primary school. They were acquaintances all the time that they were growing up and became close friends in later high school. They were married when they were twenty two, before Elise’s father had completed his university studies, and it appears that the marriage was precipitated by baby Elise. A sister was born three years later. The sister has a beautiful singing voice and plays several musical instruments including the cello. During the early years of marriage, Elise vaguely remembers her father having to spend long hours studying.

When her father was a civil engineer working for shire councils, Elise’s family had to move with each change of job. They lived in small rural communities, and moved five times in twelve years before settling in Our Town.

The early years

As far as Elise is aware, her mother’s pregnancy, her birth, and the first couple of years of her life were relatively uneventful. Elise’s mother, however, remembers the first two years to have been very difficult, as she was suffering from depression which made it even harder to care for her lactose intolerant child. Elise learnt to whistle at five months of age, and imitated other people’s mannerisms, such as an
unusual laugh. At about two years of age, she developed asthma. When she was eight, she had pneumonia and whooping cough. Her asthma recurred, and has subsequently stayed with her. She has never required hospitalisation, but she does require medication and feels uncomfortable if she does not have ready access to her nebuliser. The asthma is described as chronic, but not severe.

Elise has always loved puzzles. The puzzles available at kindergarten she had enjoyed doing when she was two. When she could stand on a chair, she helped her mother with the cooking, working out fractions and measuring ingredients. Elise learnt to read when she was three. Her early schooling was in Victoria. She attended preschool when she was four and prep school when she was five before starting infants school. She suspects that she may have been rather argumentative with her early teachers. During first grade, she clearly remembers being bored mainly because the readers they were given were far below her ability. At home, she was reading more advanced books, such as a year eight reader The Key by Theodore Taylor, and The Hobbit by J.R.R. Tolkien. During this year she was tested a year above her grade, but this did not result in any change in the curriculum she was offered.

The school Elise attended for grades three and four was well resourced and she enjoyed many excursions and extra-curricular activities. One teacher gave her more advanced reading books, but this ended when the teacher was moved to another school.

For grades five and six, she attended a very small rural school which had few resources. Even though Elise remembers this school as being good, she also feels that it did not offer her any academic stimulation. A lot of class time was spent teaching younger students to read. During these years, she was reading C.S. Lewis,
Charles Dickens and Robert Louis Stevenson, and devouring one classic each week (apparently at the time there was a cheap series of classics published at the rate of one each week and available at the local newsagency). Another problem began to surface at this time. Ever since preschool, her parents and teachers had noticed that Elise had difficulty relating with other children. At about the same time as the onset of puberty, she threw temper tantrums at school, and at home she began to treat her mother with contempt. Her mother thinks that this is understandable given the situation. “Off and on over the years”, Elise’s mother has experienced mental health problems, for which on occasions she has required hospitalisation. There were many days when Elise arrived home from school to find her mother still in bed having cried all day.

**High school**

When Elise had completed grade six, her father began a new job which meant that the family moved to Our Town. Immediately beginning high school there was “a shock to the system”, and Elise did not cope well with it. She was frightened to cross a street, felt intimidated by the other students, and did not have any friends. Because she was socially isolated, and because she was very bored and unchallenged by what was presented in class, Elise did not enjoy Year Seven.

At the beginning of Year Eight, school became more tolerable. Elise made friends with two girls, one of whom had cerebral palsy and was confined to a wheelchair, and the other had few friends because of her family’s religion. The three girls called themselves “The Outcasts”, and saw themselves very much in that light. Elise did well academically, but she feels that she lost interest in lessons and could not be bothered to do exceptionally well because “it was too boring”. She escaped the boredom of school by thoroughly immersing herself in her piano and recorder music,
and by reading eighteenth and nineteenth century European history and James Baldwin. Her mother feels that it was at this time that Elise threw herself into her school work and endeavoured to excel academically.

During Year Nine, Elise became very frustrated and bored with her school work, and experienced severe social problems at school and problems at home. Negative impact by other students was kept to a minimum, because her handicapped friend had a teacher’s aide with her at all times. Nevertheless, Elise was subjected to harassment by particular male students, which included name calling and being spat upon during class.

At the same time, she found her Mathematics so easy that she forced her teachers to do something to help her. “Bored to tears”, literally, she presented herself to the mathematics staff and pleaded that she be accelerated one year in Mathematics. The timetable was not flexible enough to allow her to attend Year Ten Advanced Mathematics lessons, but she could do her own work during her Year Nine lessons and seek help from her teacher who was happy with the arrangement. A teacher gained her confidence, and became her mentor. After school, they began working on a special programme of mathematics which covered topics and concepts usually taught in Year Eleven or later. She was bored, too, in English, because she had read all the books previously when she was in early primary school. Acceleration in English was not considered to be an option. The boredom was alleviated when her mentor started “throwing books her way”. Elise is a very reflective and religious person, so the mentor introduced her to some classic works in philosophy, including Russell, Wittgenstein, Boethius and Descartes and some female writers such as de Beauvoir, Murdoch and Warnock. She was also introduced to some demanding
theologians like Bonhoeffer and Farrer, as well as the life and work of Hildegard von Bingen.

Also at the same time, Elise’s mother suffered from recurrent mental health problems. At home, Elise suffered from emotional and physical abuse. Her mentor found respite accommodation for her, which was used during times of crises. Elise, too, was clearly experiencing her own mental health problems. Professional help was sought, and she was diagnosed with Asperger’s Syndrome, a form of autism. This is manifested by severe discomfort in many social situations, very poor verbal and non-verbal communication skills, and behaviour best described as eccentric. A recommendation that Elise be classified as emotionally disturbed was made so that she might receive appropriate educational support. However, not wishing to have diagnostic labels placed on her, Elise declined to be classified in this way.

**Senior high school**

During Year Ten, Elise completed Year Ten English and Science, topped Australia in the Enrichment Stage of the Mathematics Challenge for young Australians, and completed Preliminary HSC 3 unit Mathematics, 2 unit Music, 2 unit Chemistry, and 1 unit Studies of Religion (which *inter alia* allowed her to qualify for her School Certificate requirements in Geography because she studied Buddhism). In Year Eleven, she completed HSC 4 unit Mathematics, 3 unit (Australian Music Examination Board or AMEB) Music, 2 unit Chemistry and 1 unit Studies of Religion, along with Preliminary HSC 2 unit (Related) English and 2 unit Physics. Having therefore already completed ten HSC units, in Year Twelve she completed HSC 3 unit (Related) English and 2 unit Physics, both Preliminary HSC and HSC 2 unit Biology and 2 unit (Board) Music, a university level Board of Studies developed Distinction Course in Philosophy, and first year university Mathematics.
The school made provision for Elise to carry out most of her senior studies outside of formal classes, and most of her senior curriculum was autodidactic which "suited her pretty well". For Biology and Physics, she attended only compulsory laboratory sessions. In 4 unit Mathematics, a one hour lecture and tutorial was given each fortnight. Most of her teachers were very understanding about her needs, even though they were not completely conversant with her situation. However, some teachers did express concern about her "independent learning style" and did not like the fact that she did not turn up to class, and one casual teacher was very antagonistic towards her. Elise summarised this tersely by commenting, "A few teachers do not like acceleration."

A week before her final HSC examinations, Elise was subject to physical abuse at home, and was forced to live elsewhere. As respite accommodation was not immediately available, she lived in a combi-van for a while, without access to her notes and resources which were still at home. Under these conditions, she wrote her final Philosophy essay and gained a high distinction. On the morning of her final Physics paper, a trauma led to her starting the exam, in tears, an hour late. She scored 92%. Her University Admission Index (UAI) was 98.8.

**Elise's reflections on curriculum**

Elise has a very high opinion of the way in which the curriculum is structured in the VSO (Vertical Semester Organisation). She has noticed that students from all years interact, which she believes does not occur at other schools, and that this is definitely facilitated by the VSO.

When she was in Year Eight, Elise enjoyed a number of higher level VSO courses, including a Music course along with Year Ten students. She found this appropriate to
her ability, and she got on a lot better with and related more with these older students. Of course, when she was in Year Ten she didn't have this luxury.

A problem with the VSO is you can take all the level four subjects when you are in Year Eight, and then get to Year Ten and find yourself in the same bored situation again. I also think that it has changed a lot since I did it, from looking at my sister's VSO handbook. It is a lot stricter about what you have to take before you take what else, and having specific … set subjects every year. I feel it was more flexible for me.

However, the VSO certainly gave her access to higher level and more conceptually demanding courses when she was in Year Eight, which she appreciated because she had not accelerated in any other way. For her, it was the way she could accelerate. She also feels that she could have completed what was required from the VSO, to qualify for the School Certificate, in two years instead of three. The possibility of compacting her school certificate studies in this way was not offered to her, even though she thinks that within the school's curriculum structure this could have been done. She strongly believes that communication about these aspects of the VSO could have been much better.

Flexibility

When Elise accelerated in Mathematics, and in Year Ten when she began some Preliminary HSC studies, clashes in the timetable reflected an inflexibility in school organisation that the VSO was not able to adequately address. She got around this problem by studying most of her HSC subjects independently at home, which fortunately for her is her preferred learning style. She believes that there is an urgent need for schools to develop even more flexible organisation which allows students to progress according to individual development, performance and need, and which allows continuity of experience. However, she did note a certain flexibility which allowed subjects to count towards both her School Certificate and her Preliminary
HSC at the same time. She also appreciated the flexibility of most of her teachers, who made course requirements, syllabus notes and resources available, endeavoured to bridge communication gaps, bent some of the rules concerning the school's policy for senior studies, and accepted the fact that she seldom turned up for formal lessons. Her big concern was the lack of flexibility in the school's organisation of the curriculum, even within a system which was intended to facilitate a more flexible structure.

Elise compacted some of her Preliminary HSC and HSC studies into two semesters. This was done both by sequentially completing the two courses, and by completing requirements for both courses at the same time. The formal distinction between these two courses caused some confusion. Knowing what was examinable was not always apparent. She found it much easier and more appropriate to study the HSC requirements and refer back to Preliminary concepts when the need arose. It must be admitted that at times the paper work for the Principal was a bit of a nightmare.

**Acceleration**

Elise believes that students need to be made aware of the possibility of academic acceleration. For her, there was no communication about acceleration until Year Nine, and the idea only arose when she forced the issue with her mathematics teachers. Later, in Year Ten, when Elise was discussing acceleration options with the Principal and her mentor, she had the clear goals of both alleviating her boredom and beginning at least some tertiary studies early.

For Elise, "acceleration was very important, incredibly important." For her, academic acceleration had seven significant implications.
Firstly, academic acceleration made a huge difference in Elise’s attitude towards school. She felt much happier and more “comfortable” because she was doing more interesting and more challenging things. She was subjected to much less harassment by fellow students, and she was sharing classes with students who had similar academic interests and goals, and were closer to being intellectual peers.

Secondly, Elise thinks that she would not have done as well academically if she had not academically accelerated. She believes that it is not important to attain 100% in an HSC course or that a high UAI is necessarily a primary goal. Indeed, for her the UAI was never really an issue, and in general, she thinks that there is far too much importance placed on this score. Rather, she believes

It is important to study something which interests you, and is at an appropriate, stimulating level for you, rather than proving anything to anyone. If you’re at school and you want to be studying and you actually like it and are interested in things, and you are not to be given that opportunity, then people are going to underachieve.

Thirdly, academic acceleration allowed Elise to progress naturally with her subjects. She noticed a significant duplication of topics in various VSO courses. At the same time, she had often studied and read widely on many of these subjects already. After completing level four subjects in Years Eight or Nine, it is natural to progress to the next stage. “Starting senior subjects you feel as if you are not wasting your time.”

Fourthly, academic acceleration vastly expanded the choices available for Elise. She suggests that gifted students should have the choice of completing Years Eight to Ten in either two or the normal three years. In Year Ten, an accelerated student could then either move on a whole year, or could choose a mixture of Year Ten and Year Eleven subjects, or could choose to complete a broader range of Year Ten subjects. In any case, students need to be aware of the possibilities, and of the
difference in the demands and the level of difficulty between Year Ten and Year Eleven. If she had had the opportunity to compact three years into two, Elise thinks that she still would have spent three years completing Preliminary HSC and HSC studies, rather than proceeding to university, because it gave her the opportunity to study more subjects, including some tertiary courses. In fact, Elise completed 19 units, almost double the required number of units for an HSC, as well as two first year university subjects. However, she would also have had the choice of matriculating, leaving home, and commencing full time university studies a year earlier.

Fifthly, academic acceleration allowed Elise to access higher level courses which more closely matched her academic ability. She feels, for example, that the first year university Philosophy course, which she completed while she was in Year Twelve, was the most enjoyable and rewarding course of her school career.

Sixthly, academic acceleration gave Elise many opportunities and invaluable experiences that she would not have had otherwise. Some of the learning experiences taught her a lot about life. For example, while attending a residential course in Sydney, she bought a toasted sandwich at a bistro, and when she got the bill it included many alcoholic drinks and was for over one hundred dollars. The management did not believe that she had not bought them, and the problem was not resolved until Elise said, “Well, if I did buy them, you will be in a lot of trouble because I am only seventeen.”

Seventhly, academic acceleration gave Elise access to tertiary level courses while she was still at school. It is important to emphasise that Elise clearly understood and appreciated that these tertiary studies were an integral part of her senior secondary
curriculum. The two tertiary level courses she completed were rewarding, but some helpful lessons can be drawn from the contrasting experiences.

Tertiary level courses

While in Year Ten, Elise learnt about the Distinction Courses when discussing acceleration options with her mentor, but completing one of them was not a primary goal of acceleration. She had difficulty choosing between Cosmology and Philosophy, and chose Philosophy because she thought it would be easier given her heavy workload. The Board of Studies paid for three plane flights to Sydney, and for accommodation while at residential courses. The course was extremely well organised and structured, and the lectures and academic material were very good. However, she did find it difficult to relate to the other students in the course, because “they were inclined to have parties and get drunk during the evenings”. As a whole, the course was great because it provided the opportunity to study something that might not be studied otherwise, and “people get something out of studying for their own sake and at a reasonable level and for pure interest sake”. Contact with lecturers over the Internet was successful and invaluable. She wrote her final paper under very trying circumstances, and the support given at this time by the course organiser was outstanding. She received a high distinction.

During Year Eleven, Elise first learnt of the possibility of enrolling as a part-time external student at university before matriculating. After completing 4 unit Mathematics, she completed a course in first year university Mathematics at the University of New England. She felt that the course was very poorly organised. It did not directly follow on from the HSC course: some topics had formed part of the 4 unit course and other topics assumed previous knowledge which she had not met before. The imposition of a HECS debt caused some consternation. Administration
details were copious and somewhat complicated. Problems arose in the second semester when Elise did not realise that HECS forms needed to be filled out again, and she does not remember having been sent any information about this. She was withdrawn from the course before she even knew it. There seemed to be no student support offered by university. Residential courses were difficult to get to, and the material provided there was not of a high quality. Transport within Armidale was also problematic. There was poor communication between the university and the residential hall, which meant that they did not receive Elise’s dietary requirements. There were also minor irritations with the timing of assignments and exams. At the end of the course, there were difficulties in getting to the examination centre, forty five kilometres from home. Elise became lost trying to find the examination room, then did not have identification needed to sit the paper. After a long argument, she was admitted about an hour late. She received a Credit.

Ironically, having completed university level courses while at high school became a disadvantage for Elise. Indeed, because she had already completed some tertiary studies, some universities were unable to recognise that she was in fact a school leaver. Furthermore, she found that she was no longer eligible for many scholarships at university.

*Andantino con affettuoso*

Elise began learning music at the age of five, playing both the recorder and the piano. An early teacher, whom she greatly appreciated, did not prepare her for eisteddfods like other teachers, but rather taught her a new piece each week. After moving to Our Town, she enjoyed six years under the tutelage of a conservatorium teacher, during which time her music ability flourished. Elise loves music, enjoys playing in competitions, and has travelled around the state to eisteddfods. Before she became
interested in music, she would get involved with a hobby, such as embroidery, but after a couple of weeks it became easy, she was no longer interested in it, and she wanted to move on to something else. “But music never becomes easy! There is always a harder, more virtuosic piece to master.” Elise recognises that she has trouble expressing herself and communicating with others, and her music goes a long way towards addressing this problem. She is able to express passion and emotion through music.

Most of Elise’s spare time is spent playing the piano, the harpsichord, and the recorder. A benefactor has provided her with her own grand piano. Elise has completed the second year of a music degree at a conservatorium of music at a major university. She is now studying biomedical engineering, and is completing her music studies part-time.

**Elise’s theses**

1. Teachers need to be aware of the particular needs and learning styles of gifted students, especially gifted students with disabilities. For example, attempts to involve Elise in group work were most inappropriate, and teacher attempts at humour were often misguided.

2. Communication with gifted students concerning higher level VSO courses, compaction of courses, academic acceleration, senior courses, and access to tertiary level courses needs to be much improved and expanded. Gifted students have a right to know all the possibilities of the curriculum, and are certainly in a position to understand its ramifications and to make informed decisions about their education.
3. There is an urgent need to develop even more flexible school organisation which will facilitate academic acceleration, compaction of courses, access to higher level courses, and access to tertiary level courses. Gifted students need to progress in a natural way through their curriculum, at a pace and at a level appropriate to their intellectual development, their academic ability and performance, and their individual needs.

4. Academic acceleration is an available and viable option. It goes a long way to meeting the needs of the gifted students who use it. The reasons why it is seldom used - teacher antipathy, inflexible school organisation, and lack of communication - need to be seriously and adequately addressed.

5. Access to tertiary level courses is an appropriate and natural progression for gifted students who have academically accelerated and who have completed HSC courses ahead of their cohort and at the highest level. Elise envisages a possible broadening of access to tertiary subjects while still at school. Her experiences accent some of the difficulties and problems which need to be addressed in order to expand the curriculum for gifted students in this way.
Case study four - J

J was born in September 1982. At school, he never won academic awards, and was considered by most to be an average ability student in all subjects except Computing Studies. He was identified for this study because, when he was in Year Eight, he accelerated his studies in Computing Studies, completing HSC Computing Studies two years ahead of his cohort, and completing first and second year university courses in Computing Studies while still at school. He has now completed his first year of a full time, internal university course in Computer Science, receiving high distinctions in all subjects.

He is the oldest of three brothers. He grew up on a farm about fifty kilometres from Our Town. The family home looks onto farmland, and is surrounded by heavily timbered forest and national park. The landscape is dominated by an awe-inspiring mountain. J has intense and sparkling blue eyes, and has dread-locks in his hair.

Grandparents

J’s paternal grandfather was a general practitioner, and spent his working life in Papua New Guinea and in Queensland. He has an extensive library, mainly consisting of mathematics and computing books. “He is a compulsive collector, but he collects good things.” Most of this library is kept on the property where J lives, and J enjoys unlimited access to them. J knows his grandfather very well, seeing him often, about every two or three weeks. When the grandfather visits from Brisbane, he always brings a bundle of books for J to read. “We debate about all sorts of things. Philosophical issues. Like, how do you define truth. He lent me his philosophy books from when he was at uni. I found that pretty interesting. My first
computer stuff was from my grandfather, because he had books and was really into it in the sixties. He had quite a lot of old computers. It would have been quite expensive then.”

Before marrying, J’s paternal grandmother had been a nurse. She is very interested in photography, reads extensively, and travels quite a lot. “She always has a good story to tell. The good thing about it is each time she tells the story it gets a bit better.” J discusses philosophical issues with her, as well, but “We usually come out at loggerheads. The times they grew up in were a lot different times.”

J does not know his maternal grandfather very well, has not seen him for eight years, and does not know where he lives. He had worked as a driving instructor before joining a government roads and traffic department. “All I know about my mum’s mum is her name and that’s about it.” The maternal grandparents had separated when J’s mother was three, and she grew up with her father.

Parents

J’s father grew up in Brisbane, and completed some tertiary education courses in Agriculture before becoming a farmer. J’s mother attended university, studying Political Science and Philosophy. She did not complete her degree because of the arrival of J. J’s parents first met when they were nine. Years later, when next they met through a mutual friend, J’s father said, “Haven’t I seen you before?” and of course J’s mother thought that this was “the cheesiest pick up line”, and it was not until about five years after they were married that they realised that they had in fact met before. The whole family reads a lot of books of very different types.
Early development

Apparently, there were some problems associated with J’s birth. However, he had very few childhood illnesses, but, at various ages, did have whooping cough and tetanus. Because his mother always encouraged reading, he learnt to read before he went to school. Even though he grew up on a farm, and always had animals, he never considered himself to be a farm boy. Rather, he was always into the sciences. “My parents bought me a chemistry set early on, and I used to try to blow things up with sodium.”

When he was six, he went to preschool for only one day, and then started kindergarten the next day. He attended infants and primary school at a small, rural two-teacher school servicing farming and saw-milling communities. He was particularly fond of Dr. Seuss books and biology books. “My grandfather gave me junior biology books. I was always into that, mostly marine biology. I had a fascination for what was actually in the deep water.” He used to help other students, who were experiencing difficulties, with their reading.

High school

J was excited when he progressed to The High School. “I really enjoyed at least the first four years of high school. Because I was at high school. There was a great library. And most of all the computer classes. Before that, in primary school, I had no computer classes. At home, there were always computers around. The first one we bought was in ’89. The VSO courses ‘What makes computers tick’ were the best courses, because they were programming. I was always interested in how things work, and programming I always really enjoyed. I did both these courses in Year Eight.” At the same time, J also did more advanced Science courses, and often found
that he was the youngest person in his class. “The VSO was great. I really enjoyed
the VSO, because it tended to group together people who were interested in the same
things, and it allowed you to choose a course when you were ready. Though I could
have done with a few more computer courses.”

By the end of Year Eight, J had completed all of the VSO computer courses. “I
thought about more computing as soon as I had finished Year Eight. I rang the
principal and asked if there were any more computer courses, and he offered me
senior computing studies if I wanted to. This was a surprise to me.” So, when he
was in Year Nine, J studied Year Eleven Preliminary HSC Computing Studies, and
completed 2 unit HSC Computing Studies at the end of his Year Ten. The 3 unit
course was not offered by the school that year.

**Tertiary courses**

J did not have any particular plans for when his HSC Computing Studies was
completed. The majority of his Preliminary HSC and his HSC followed the
traditional curriculum. However, he did look forward to doing more computing
courses. “I’m interested in a very select field, I suppose. No, I’m interested in a lot
of things. And I looked through my TAFE and uni courses and there are a lot of
things I’d like to do. I really enjoy learning things. I had thought about furthering
my studies, but I hadn’t specifically thought about uni.” A mathematics teacher at
The High School suggested enrolling in a university course, and offered his help with
seeking admission and with administrative details. This teacher also “found” funds
to pay for textbooks, residential courses, accommodation, and transport to and from
the university which was six hours drive away. “This was a surprise. The only real
problem I had with it was high school and uni time clashed with each other. Times
for assessment tasks overlapped or clashed. You have to plan what you are going to do.

"I had never had to motivate myself and study by myself. I never really had to study before. It was a kind of a rude awakening. It was an interesting course. Not enough programming. But there were electives you could choose. The communication from the uni was new. I was relating it back to the kinds of things you get at high school and quite often getting the wrong idea. The first exam notice they sent me out I misinterpreted, and that was a bit of a problem. Luckily they awarded me a special exam." The examination advice from the university gave the time of the examination as 09.15, then stated, "Examinations Commence at 9.00 a.m. and 2.00 p.m. not as shown on your centre form" (sic). Because he lived two hours’ drive from the examination centre, and because the earlier time was not convenient for his parents to drive him there, J interpreted the advice to mean that he could present himself for his examination at the afternoon sitting. This, in fact, was not the case. "I didn’t think to ring the university and confirm." He therefore had to apply for, and was granted, special provision to sit the examination at a later date.

"I think it would have been a lot easier if I had not enrolled in a Bachelor of Science (that is, if he had enrolled in courses not leading to a degree). I enjoyed the course. I found that I should have spent more time on the actual (second year of university) course, but at the beginning of the year I was just starting the HSC and I was focussing too much on one or the other and never enough on both. I think it means spending less time exploring other avenues. I would have liked to have done more of the university courses. I found it more exciting and much more interesting studying at uni." He also taught himself, for example, C++ programming and fractal image compression.
J saw the university studies as simply part of the senior curriculum at The High School. “Every time I was sent a HECS update, I would think, oh, no. I have gradually owed the government more and more. I haven’t really enjoyed being in debt. I’ve always wondered what they spend all that money on. All I do is send away assignments and they mark it.”

“I got a lot out of the course. You have to apply yourself a lot more than in high school. It was all interesting. There was nothing that they gave me that made me feel bored. A major advantage is the courses I’ve done will be recognised anywhere. I liked UNE, and will probably continue my course there.”

**J’s reflections on education**

J points out that gifted students need more awareness of their situation, suitable recognition for what they do, and, if they accelerate their studies, special care needs to be taken with tracking their progress. “There were a few things which were quite annoying. I did 3 unit Computing Studies when I was in Year Eleven, after I had finished the 2 unit course in Year Ten, and it doesn’t seem to be recognised on my record of achievement anywhere. I have the exam results for it. So more awareness would have been okay. There were times, also, when I needed to use the library, where there would be quiet study time, because there was nowhere else where I could study. Sometimes the library was too full. I was very happy with all the other support the school gave, especially the text book funds and the financial help with residential courses. The accelerated, in-school HSC part was a problem. Study times, and parts of courses overlapped, like a standard school unit, and it was kind of odd. I was doing only a third of the required hours of PE that year, and the PE teacher wasn’t very happy about that. But it was mainly a place to study, and other
teachers recognising that I wasn't going to be in their class all the time, because I had a Year Twelve class which was overlapping with it, too.”

Having a facility for computing brought J unusual opportunities and interesting ethical problems. “I deciphered all of the school’s passwords. Before I was in Year Nine. Then they started to increase security, but they haven’t properly done that yet. I probably should tell them sometime. But no one else should be able to do it. And I find that accelerating, or at least in the field that I did, it wasn’t so much as being gifted, it was just so much that I had a computer at home, I wasn’t afraid to break it, if I broke it, it could just get fixed or I would find out how to fix it myself, and by doing that, by breaking it a lot of times, I managed to gain knowledge, through either fixing it or just not being afraid to push forward into unknown ground.

“I could have done certain things better for myself. I could’ve applied myself more to my HSC. It was probably the opposite to what I should have done. In Year Seven, I made an extreme effort, and it kind of got drawn off towards the end. It was not so much that I was lazy, it was that I was motivated towards the type of thing I had more interests in, the things that I learnt by myself at home, through my grandfather’s books, or with the computer. And I think that because I spent most of my time learning on my own, that’s why I actually accelerated. I think that it is important that people are allowed to do what they are interested in.”

J has some important thoughts concerning a negotiated curriculum, and the way in which the role that students have in this process is communicated to them. “In all, I enjoyed my school career. VSO and acceleration were both pretty good. I think more people should have the opportunity . . . . I didn’t know anything about acceleration, and I’m quite sure that no one else does. If you do the work, and you do it all, and you do it well, then you can accelerate, and I think that that has to be
explained a bit more, especially in Year Seven.” J suggests how this might be done: Students should receive recognition for completing their work early. You should be able to complete a course in your own time (the syllabus being made available to students before the course). Students should be able to sit the exam for the end of a module without having attended lessons for it (maybe J means pre-testing as well). “If a student already has a solid grounding in what’s being studied, they should be able to go on to the next level.”

J also has some clear ideas concerning the support which accelerated students need. “I found that with only one computing teacher at the school, it was hard to get information, whether it be about a course or help with studies during school hours. Because she was the only teacher that was qualified to teach computing studies and there were computing classes going on pretty well much all of the time, it was hard to find spaces where she was free.” J suggests that it should have been possible to gain access to a teacher who was a specialist in his area of interest. Or, perhaps a time period could be set aside, for example, during Wednesday afternoon sport, for accelerated students to get help or have tutorials. “You don’t need face-to-face, you just need information really. It could work quite well over the Internet.”
J's theses

1. School organisation needs to be more flexible, the highest level courses need to be offered to gifted students and run with full face to face teaching, and school resources (study rooms, technology, library space) need to be made available for gifted students who follow an alternative curriculum.

2. Both academic acceleration and access to tertiary courses while still at school are appropriate ways of meeting the needs of gifted students, even those with high ability in a restricted domain. This needs to be fully supported financially (texts, travel, accommodation, and HECS) and with access to specialist tutors. Support (in the form of a qualified teacher) is also needed to help deal with administrative details, with coordinating courses and programmes, and with the tracking and certification of courses and programmes completed.

3. Gifted students need to be given appropriate recognition for what they do.

4. There needs to be better communication about the pathways and courses available for gifted students. Gifted students need to be actively involved in planning, choosing and developing their curriculum, that is, their curriculum needs to be negotiated.
Case study five - Kerr

Kerr was born in Britain in October 1982. He was identified for this study because: he academically accelerated his schooling in several subjects, completing ten HSC units before he was in Year Eleven; he gained access to several tertiary courses while he was still at school; he was Dux of The High School; and, over a period of seven years, we worked closely together. Kerr is the older of two brothers. His sibling Tom is the subject of case study six. Kerr is tall and thin, with long, straggly blonde hair. He is very shy, and very quietly spoken. He speaks with a hybrid English and Scottish accent, chooses his words very carefully, and uses rather complicated syntax. He has an excellent memory, a keen wit, and a very subtle sense of humour.

Grandparents

Kerr’s paternal grandfather passed away when Kerr’s father was fifteen. He had grown up in Wales and Malaysia, and lived in Lincolnshire for most of his life. He was a carpenter by trade, and had been one of the people involved in the handing over of power to Malaysia when it gained independence from Britain. This experience was later to trigger Kerr’s interest in Asian languages. Although he did not receive a tertiary education, his sister was one of the first women in Britain to graduate from university. Her books are still kept within the family. Kerr has met his paternal grandmother several times. She grew up in Middle England. She did not attend university, but for five years did live with her husband in Malaysia, and now lives in Lincolnshire.

His maternal grandfather came from a long line of East Lothian (Scottish) farmers. Kerr is not sure but does have the impression, gathered from family accounts of his
nature and his interests in poetry, that he was university educated, although this did not have any bearing on what he did later in life. Kerr’s maternal grandmother came from the north of England, and studied music at university. Much later in her life, she taught music to hospital patients. After marrying, they spent several years farming in the semi-arid region of Central Australia. They returned to Scotland when this did not prove to be viable, or perhaps it was because they simply felt the need to return home where it was wetter and greener. Kerr’s mother was consequently born in Australia and grew up in Scotland.

All of the grandparents were politically conservative, taking part in rallies and raising funds for the Tory party. They passed on to their children and grandchildren a practical humanitarian interest.

**Family**

Kerr’s father grew up in both Malaysia and England, and was educated in private schools, more than one because he was “thrown out” of a couple of them. Later, when his father had died and his mother was suffering from cancer, he left school at sixteen, took on a lot of family responsibilities, and completed his “A” levels at night school. After spending time in the work force, he went on to university, studying Politics, English, History, and Philosophy, completing two degrees and gaining double first class honours. He gave up his career as a social worker to be a father to his two sons.

Kerr’s mother, against her parents’ wishes, was educated at public schools, and then completed a university degree in French and History whilst completing a diploma in Music during her spare time. For several years, she taught music to children placed,
for various reasons, in institutionalised care. She now teaches Music at a conservatorium of music and also privately.

Kerr's parents met during the late seventies, while they were employed in a social work institution in Scotland. After they were married, when Kerr was two and shortly after his younger brother Tom was born, the family migrated to Australia. From Perth, they travelled across Australia, spending time in Condobolin before settling on the north coast of NSW.

Kerr admits that he does not get on well with his younger brother, but suggests that this is normal. He sees his brother as a more noisy and active person, whereas Kerr is more contemplative. They therefore often draw quite different conclusions on a lot of issues. He does get on very well with both of his parents, certainly much better than what is normal. He generally agrees with their philosophical outlook on life, and where he disagrees with them he accepts that this may simply be the optimism of youth. The area of biggest difference would be in attitude towards modern technology.

"I am certainly not in agreement with the capitalist structure of society, but I'm not wanting to batter it down and set up something different ... because changes have to be at a pace people agree with and cope with, and so that democracy will prevail or at least as much as it does now, and that's because I'm not sure how much a democracy prevails in a democracy."

Kerr is a vegetarian by choice and by philosophical conviction. "I find my commitment to ethics infinitely stronger than developing a taste for meat."

Discussion of philosophical, ethical and political issues is rather common at home.
They are a very close musical family. Both sons have received a lot of support to enjoy playing music and to take it to a high standard. Even though he does not get on well with his younger brother, Kerr does find him to be a good musical accompanist.

**Early development**

Kerr’s early childhood was free from illness and childhood disease. He started to learn music when he was three, and learnt to read before he began school. He attended pre-school part time, then started school when he was five. For the first few years, he attended a small, rural, one-teacher school, and therefore shared classes with students in Years K to Six. When he was in Year One, he distinctly remembers reading “The Wizard of Oz” about twenty times, and learning primary school mathematics, for example, multiplication, division and fractions. During this time he also began to play the recorder, and, when he found that he was enjoying this, he practised more, the music lessons became more formal, and he also started to learn to play the flute. Kerr remembers all the children at his school getting on well and playing together. Otherwise, he remembers receiving a traditional curriculum from his first teacher, and a more progressive and innovative curriculum from his second teacher who was more influential on his development.

When Kerr was in Year Four, in response to a perceived need rather than due to formal testing, he was placed up a year. Some people did question whether this was appropriate, mainly because of his handwriting. Then, about half way through that year, the family returned to Scotland. This was so that the two boys could attend a school for gifted young musicians, receiving a normal schooling as well as specialist tuition. The family was able to spend valuable time with grandparents. However, put off, perhaps by the dreighness of the Scottish weather, or was it the crowding of
people and the cultural and social changes which had occurred in post-Thatcher Britain, they returned to Australia.

The family considered settling in Tasmania, before finding a small, isolated property in the mountains forty kilometres west of Our Town and finally settling there. Ten kilometres past the end of the bitumen, along ten kilometres of rotten-rock gravel determined by the shire council to be a road, there is a gate, then another one, and half a kilometre of dirt track winding through the forest trees to their hundred acre block. At the bottom of a steep hill, overlooking a pristine mountain creek and surrounded by scrub, is the home being built by Kerr’s father. There is no mains power. There are a couple of ten watt solar panels and a small generator which charge some twelve volt batteries. The telephone, once locked in a shed near the gate, is now connected at the house.

Thus it was that Kerr attended the local, small, rural, isolated, one teacher primary school. Here, his teacher struggled to keep up with providing what was hoped to be an appropriate curriculum for him. This included a mathematics programme extending into Years Seven and Eight, especially geometry, which, ironically, later proved to be Kerr’s weakest mathematics discipline. And thus it was that Kerr’s teacher telephoned The High School in Our Town and made a plea for help. A mathematics teacher from the high school became Kerr’s mentor, and worked closely with him for the next seven years. During Year Six, Kerr completed Year Eight Mathematics, and enjoyed participating in the challenge and enrichment stages of the Mathematics Challenge for Young Australians.
High school

Kerr adapted well to the changes high school brought. He accepted the bus travel as a necessity of life, and generally was not troubled by peer pressures he encountered for the first time. Once, along with other members of a cooking class, he prepared a dish which included meat, very much contrary to his beliefs. The principal arranged for him special tuition in assertiveness. Kerr often sought refuge in the library, and made excellent use of the resources available there. When he was in Year Seven, he studied the normal Year Seven curriculum as well as a VSO course in problem solving and Year Nine Advanced Mathematics. Time tabling problems meant that he attended Year Nine Intermediate Mathematics classes but studied the advanced course independently. Although this was satisfactory and he felt comfortable placed in this situation, he did witness many disruptions by students who were not significantly interested in what was being offered or taught. Most students showed a positive interest in their unorthodox classmate, and only a small number made negative comments about him or tried to put him down. With his mentor, he began after school extension lessons in mathematics and a programme of advanced problem solving, which continued for four years.

When Kerr was in Year Eight, he was placed in an unstreamed Year Eight core English course. The remainder of his courses were all at Years Nine and Ten level. He thought that, at first, the VSO curriculum structure of the school, though perhaps controversial, did work very well for him.

Accelerated HSC studies

The following year, when Kerr was in Year Nine, he had less choice of advanced VSO courses, and, indeed, in some cases there were no longer any courses for him to
do. Again, timetable clashes occurred because, along with his junior curriculum, he was also studying HSC courses. He did not attend any Year Eleven 3 unit Mathematics lessons, but studied this course independently and when necessary discussed problems with his teacher or his mentor. He did not feel entirely comfortable about this arrangement.

Two years previously, Kerr had completed an introductory course in Indonesian. At the beginning of Year Nine, he approached the principal to seek permission to study more Indonesian by correspondence. The principal explained the situation to the director of the distance education centre, who thought the idea preposterous. The principal therefore put Kerr on the telephone to talk with the Indonesian teacher. It must be noted that a very shy Kerr would seldom have had the opportunity to use a telephone. After a couple of minutes of conversation in Indonesian, Kerr was accepted straight into the Year Eleven course.

At the end of Year Nine, Kerr completed his first HSC course, which was 3 unit Music, majoring in Recorder. In order to gain tuition at a level appropriate to his ability, he regularly travelled three hours each way, and occasionally six hours each way, to attend a conservatorium of music.

When Kerr was in Year Ten, he continued to study courses offered in the VSO. However, the majority of his subjects were senior courses. He completed six Preliminary HSC units. Although his mentor recommended, for reasons mainly concerning depth of coverage of the work and expected average results, that he defer HSC exams for one year, Kerr did complete HSC 3 unit Indonesian and HSC 4 unit Mathematics. It must have been very disappointing for him to be overlooked when the school awarded the annual prize for the student in Year Ten with the most potential. Equally, something strange in terms of Kerr’s acceleration pattern, or an
oversight by both the principal and his year adviser, meant that the NSW Board of Studies did not award him a School Certificate, even though he had met requirements for this by the end of Year Nine and, at the latest, should have been awarded it along with his cohort.

**A technological world**

A couple of years previously, Kerr’s mentor had tried to raise funds for a computer for Kerr, but had received support from neither the Department of Education nor private enterprise. Partly to compensate for the lack of recognition of Kerr’s achievements, the mentor “found” some money which paid for a computer. It was specially wired for both 240 volt and 12 volt use, and quietly presented to Kerr during the summer vacation.

Before this, Kerr did not have many opportunities or stimulation to play around with programming, although he had already picked up a couple of computer languages in VSO courses. The acquisition of the computer triggered his quickly developed interest in computer science. He taught himself assembly programming, and designed his own operating system, which he later presented in his HSC Design and Technology portfolio.

“I taught myself assembly programming for the X36 processor, which may sound as if it is something which is about to disappear and die in its technological niche. But I think that in terms of having a detailed picture of how something works, even if it is something which is going to become obsolete in itself, it helps one think about the whole way computer systems and the programmes are built up. Over the top of that, I think that’s been the key in terms of stimulating the technical side of my interest in
that. There’s no way I could have done that without having access to working with a computer at home.”

A distinctive HSC

Also during the summer vacation after his Year Ten, Kerr was accepted as an external, part-time student at The University of New England. He enrolled directly into the second year of a native speaker’s course in Indonesian. Kerr’s mentor “found” some funds which paid for university texts, residential courses and accommodation, and transport to and from the university.

Thus it was that, when Kerr was in Year Eleven, he completed four Preliminary HSC units, HSC 2 unit Aboriginal Studies, HSC 2 unit Chemistry, HSC 2 unit Related English, and second year university Indonesian with Distinction. Studying under the auspices of the Australian Music Examination Board (AMEB), he also completed two diplomas, an AMusA in Classical Guitar and an LMusA in Recorder, both with Distinction.

And thus it was that, when Kerr was in Year Twelve, he completed HSC 3 unit Computing Studies, HSC 2 unit Design and Technology, HSC 2 unit Physics, first year university Latin, first year university Computer Science, second year university Computer Operating Systems, and third year university Indonesian. Due to technical problems associated with his isolated situation, he finished the year just short of completing his LMusA in Classical Guitar. At the end of his Year Twelve, he was awarded Dux of The High School.

Because of a lot of dedication and hard work throughout his time at high school, Kerr had to his credit twenty-three HSC units, just over the equivalent of one year of full-time university studies, and three music diplomas. He emphasises that he enjoyed
the learning, and saw as integral components of his secondary school education each of the courses he did while at high school.

**Kerr’s reflections on education**

Looking back on the time when he was in Year Nine, Kerr starkly contrasts his Year Eleven Mathematics studies, using resources written with the assumption that students attended lessons, with the well-structured correspondence course in HSC Indonesian he was concurrently studying, using resources specifically developed for independent learners. He also reflects on the fact that, in most subjects, topics covered in the VSO are repeated in the HSC, and topics in the HSC are repeated in first year university. He now emphasizes what he sees as very real problems. “What happens when you get to the end of the VSO early? And a more major problem is the extent to which things are repeated.” He thinks that, in the light of these problems, better structured courses are warranted, and that the disappearance of streaming is not a good thing.

To a large extent, Kerr overcame these problems by academically accelerating his studies, which he did in six ways. He progressed at his own pace. He skipped grades. He compressed courses. He showed that he had already met the outcomes of a course. He studied courses and their prerequisites concurrently. He worked independently. With his mentor, just for the enjoyment of doing it, he also completed a programme of work which was not part of a formal course.

“I also believe that, probably far more controversially, the focus on continuous assessment isn’t really productive in that it encourages people to think that what they should be doing is work, not learning, and that what you know at the end of the course doesn’t really count for a lot. I understand that people think about strange
exams, but, in the end, if whether you know it at the end of the semester or not
doesn’t pertain to what you go and do in the next semester or the next year, I don’t
think that that drives the courses forward in terms of people’s learning. I think it
means that people put more time into making sure that the work they submit during
the semester is good work, and the teachers expect that and focus on that, rather than
assessment and goals being in terms of what you achieve inside your head by the end
of it all.”

Tertiary courses

When Kerr was in Year Ten, the idea of gaining access to tertiary courses arose
because he was at that stage completing HSC courses in Mathematics and
Indonesian. There were Distinction Courses available, but he thought that, through a
loophole, he might be able to get into a native speakers course in Indonesian.
However, he chose to apply for admission into formal university courses because
they would count towards university studies later and would give him advanced
standing in those subjects. By and large, Kerr thinks that completing several tertiary
courses met many of his needs. However, some of the problems associated with
distance education became apparent. For example, there was a feeling of lack of
continuity and fulfilment in the Indonesian course, because the slow turn around time
for the five or six significant assignments during the year meant that there was
essentially no direct feedback, particularly for the oral work. This problem was less
accentuated in the first year Latin course because there were six assignments per
semester rather than per year, and the lecturer made sure that assignments were
marked and returned before the next one was due.

Kerr found the residential courses he attended very beneficial because they were
integral with what was happening in the courses he was doing. During lectures, he
was able to ask more than his fair share of questions. He was accepted by the mature age students who were doing the same courses. At night, while the others were partying, he was able to take advantage of being in a large city and enjoy cultural events that he normally would not have the opportunity to see. He also took advantage of gaining access to the excellent resources available in the university library.

"I guess from an environmental perspective, in terms of paper wars, I think it is a bit disconcerting, particularly given some of the administrative material is repetitive. But in terms of being able to read it, if anything, I think it was probably good for my school reading. I don't think that it posed an extensive problem in that respect."

"I think that I probably, retrospectively, have a slight amount of regret about the overall study load I ended up taking, particularly towards the end. But certainly in any respect other than that, in terms of time tabling or adjusting my mind or anything, I didn't come up against anything."

Accumulating a HECS debt "was a bit annoying". "I was able to pay up front for the second year Indonesian course and so get the 25% discount which helps a lot in terms of what it adds up to. But the next year it was basically all too much to do anything like that and I was broke after having paid off the Indonesian. But I have to live with anything that comes along, and if what's available is that I have to pay HECS to do that, I was prepared to take that because I would prefer to do that than not do it. I guess in terms of me, I don't see HECS as a big problem because I'm not the sort of person who gets debts on credit cards and mortgages and things. I know that it is something that will probably be manageable in the context of my life. But it is quite possibly the only debt I will ever have."
The university courses, which Kerr completed, were seen by him to be an integral part of his school curriculum.

**An alternative emphasis**

"I think my twenty-odd HSC units are interesting. I think that my UAI is undervalued in that context because the best ten don’t stand out as much as if you only do ten, because I would have put more time into them. But I think in terms of what it means for me and where I can go with that, I was quite willing to sacrifice up to two points on my UAI. Whatever difference it happens to make, I’ve got a UAI that is good enough and I’m quite happy to sacrifice that for more breadth and interest and things, rather than being slightly more perfect at just a few subjects."

"The UAI is just a number. I’m slightly sceptical about how well even just as a number in terms of evaluating people who take a standard range of courses. I’m not sure how much emphasis it does place on some others. And the loading scheme, on the face of it, doesn’t place any emphasis on any course except by the strength of the candidature that does it, but because that definition has to be recursive, I’m a little bit sceptical about how well that works.” Kerr cited the case of a student he met who studied courses below their ability (2 unit English instead of 2 or 3 unit Related English) in order to gain marks several standard deviations above the mean and thus gain a high UAI. He thinks that this is inappropriate as well as making the UAI lacking in meaning. “A reasonable proportion of students choose subjects that will put them way above the rest of the candidature rather than ones which will extend them. To get a high UAI they sacrifice what they could be doing at school that may be of interest to them.” As it happens, Kerr attained a UAI which was in the top half of the nineties.
Kerr feels that a lot of the staff worked very hard and did a lot to be flexible and provide for his needs and by and large have done a good job of it. He feels that the structure and precedent for meeting his specific needs were not in place and recognises that this was an impediment. The only thing that he had difficulty with, in terms of furthering his education with resources and such, was the problem of taking Computer Science at University without the necessary computer communication facilities available at the school. He got around this problem by using other resources in the community.

*Scholium*

Kerr is now a student at the University of Sydney. With his advanced standing and credit transfer, he believes that he will complete two degrees with honours within four years. He is continuing his studies in Mathematics, Computer Science, and Linguistics. Indeed, he is thoroughly immersing himself in Pure Mathematics, much to the delight of his old mentor. He is also studying the recorder and classical guitar at post diploma level.
Kerr's theses

1. Academic acceleration, in its various forms, and access to tertiary courses while still at school, are both appropriate and important curriculum options for meeting the academic and intellectual needs of gifted students.

2. Gifted students require specialised, high level courses throughout their schooling, including when VSO and HSC courses have been completed ahead of their cohort. Such courses need to be well structured, and supported by appropriate resources. They should be offered in at least streamed classes, and preferably in specialist classes with peers.

3. More flexible school organisation is needed, especially with regard to timetabling and to meeting the outcomes of courses. Gifted students should be informed about and involved in planning a negotiated curriculum. Certification, more recognition, and better tracking of courses completed, are needed for gifted students who have accelerated their studies.

4. Financial support is needed so that gifted students may gain access to appropriate level courses at other institutions, and this should cover HECS as well as expenses for travel, accommodation, textbooks, and other resources.

5. Financial support is especially needed for gifted students from low socio-economic backgrounds and gifted students living in isolated situations, so that they may gain access to specialist textbooks, computing hardware and software, university libraries and laboratories, other resources associated with large centres, appropriate work experience, and a (paid) mentor, and may have opportunities to work, study and relate with peers.
Case study six - Tom

Tom was born in Edinburgh in August, 1984. His mother had wished to have a home birth. He suspects that her doctor tricked her by giving an early due date, so that, when Tom was late, the birth had to take place in a hospital. He is the younger sibling of Kerr, the subject of case study five. Tom was identified for this study because he accelerated his schooling by one year, and because he almost became the youngest person to have completed an HSC subject. Tom is tall and thin, with neat, short-cropped dark hair. He speaks with an unusual northern English accent, although, in his father’s opinion, he speaks “a language other than English” at home.

Family

Tom does not have such a detailed knowledge of his family background as Kerr has. He does point out, however, that his paternal grandfather in fact served in the Royal Air Force in Malaysia, and later was an authoritative figure in the withdrawal of Britain from Malaysia. He has met his paternal grandmother a couple of times, but does not remember much about her.

While living in Edinburgh for a short while, Tom got to know his maternal grandmother quite well, and he remembers her with affection. She had a large library, and a grand piano. She used to organise music in hospitals, so the two brothers both got a chance to visit hospitals and play music for aged patients.

Tom’s details of his parents’ earlier lives are sketchy. He thinks that his father has a degree in sociology or psychology, but he does know that his father did work as a social worker for a while. He thinks that his mother has a university degree in music, and knows that she has taught music both at schools and privately. He does not have
a clue how his parents met. Tom is very interested in a career in the Royal Australian Air Force, much to the dismay of his pacifist parents. “Both my grandfathers served in the armed forces, so it must be a generation thing.”

He vividly remembers the time in Edinburgh. “The whole family moved to Edinburgh so that Kerr and I could attend a music school. But we did not get any joy out of that. We came back and lived in Hobart for six months, but we did not like living in cities. We looked around for a while, and found our property west of Our Town.”

Tom thinks that he gets on all right with his brother, but does describe him as “a bit of an idiot”. “We have different viewpoints on many things. We argue a lot, but that is to be expected.” For many years, as long as he can remember, they have played a lot of music together. “We still argue. We argue about what interpretation to place on the music.”

**Early development**

Tom learnt to read when he was three. He was reading books such as *The Wizard of Oz* and *Charlotte’s Web* when he was five. During primary school, he read a lot of books by C. S. Forrester. When he was in Year Six, he gained access to the high school library through his brother. He began to read fantasy literature, and he is still an avid reader of this genre.

He went to pre-school when he was five, but did not enjoy the “disorganised organisation” and quickly became bored. He found Kindergarten very easy. At the end of that year, Tom skipped a grade, and went straight into Year Two. The arrangement to accelerate him was made by his parents, with the agreement of his teacher at the small, rural, one-teacher school. “In the small school setting, there was
a lot of availability of setting different work for different students if they could get work done quicker or found it easier.”

“It was strange when we moved to Edinburgh. It was the first big school I had ever been to. There were seven hundred kids there. There was virtually no playground, and you couldn’t go out and play. There was one small square of grass and most of the time it was out of bounds because it was too muddy. There was a special dining room where you had to go and get your lunch. It was a music school. I played the violin and the piano, and every day I would have time out and go and do music. It was very technical teaching which I did not enjoy a lot. It was based on technique and there was not a lot of fun in the teaching. The bit I enjoyed most was the orchestra. I got to play in the school orchestra, and I’ve never had the chance to play in an orchestra apart from that. It was a lot of fun.”

“I went to three schools in Year Four. It was hard. Different teaching processes. In a way, though, it was good, because we got to see different ways of doing things.”

When the family settled west of Our Town, Tom attended the local, small, rural, isolated, one-teacher primary school for Years Five and Six. Even though he was a year young for grade, no special provision was made for him. By way of an exception to this, he worked with students, another year ahead of himself, on extension work in Music and French, both taught voluntarily at the school by his mother. There was another student good at mathematics, and Tom enjoyed the competition from him.

**High school**

The progression to The High School was easy. He made thorough use of the school library, and as well as fantasy literature he also read George Orwell, Aldous Huxley
and J. D. Salinger. He quickly came to dominate the school’s chess competitions, and captained the chess team for four years.

High school brought Tom a lot more academic opportunities. This was especially so when he was in Year Eight, and could choose more advanced courses from the VSO. “For example, I did Advanced Chemistry which is normally a Year Ten course, and I did it in Year Eight. When I was in Year Nine, I did Physics, a Year Ten course, and Is There An Answer, a course in advanced problem solving. This also meant that I couldn’t do the courses below that the next year. It would have been deadly boring. I did the core English and Maths courses, and a bit of Cabinet work. I still read the Chemistry books, but I couldn’t do any more courses. I didn’t see this as a problem, because I probably wouldn’t have done Year Eleven Chemistry at that time anyway. “The only course I regret not being able to have completed was the music one. I would have had to go to Sydney to sit my HSC performance exam, which I couldn’t afford to do. I was going to do this in Year Eight, and wasn’t able to sit it after that because the courses changed and I haven’t even got any accreditation for that any more. I found out later that the school could have helped me with this, but I didn’t know that at the time. So I had to sit my Grade Eight violin and forget about it, basically. I regret this. I probably wouldn’t have wanted to do anything at uni. I would have gone on with AMEB, and it might have given me more enthusiasm to go further. It would have been good for my ego, as well. I got a letter of notification from the NSW Board of Studies that I would have been the youngest person to ever have sat an HSC exam. And I didn’t do it. So .... That would have been fun.” “I think that in some ways the VSO is good because it gives people the chance to follow their own interests, other than everyone being forced to do the same thing, and make people into sheep. But in other ways, some students feel that they should
do a course because, for example, with Chemistry, they will blow things up, which is just a common view, but it makes a lot of people who aren't really interested in Chemistry do the subject. So in ways VSO takes away opportunities as well as giving them. This could be made better if teachers had a say in who did what courses as well. The teachers should interview the students who are in their course and decide if they are appropriate for that course, or if they would be more suited to another course. This would put students into courses with other people with the same interests and would give them more opportunity to learn as much as possible in that situation.”

The communication about VSO was good. “I read the VSO handbook, and I thought, that this will give me the opportunity to do this and that. This sort of back-fired on me because halfway through Year Eight they changed the system to make it so Science had compulsory core Science for Years Eight, Nine, and Ten. I had already done the Year Eight and Year Nine compulsory units. While everyone else in Year Nine were doing Science, I had to do another Science course by myself. I did Physics, and Water Ecology, and enjoyed them. I got along well with the teacher.”

During Years Seven to Ten, Tom worked with one of the mathematics teachers on a special, extra-curricular programme of advanced problem solving and mathematics extension topics. “That was fun. The Euler and Gauss series explained themselves well. They teach you how to do something then give you problems to test how well you'd done that, and in a competitive situation. The only problem was that, when I got to Years Ten and Eleven, I felt that I had already done this stuff, so I didn’t have to put so much effort into it. Then it gave me problems because it was at a slightly more advanced level, and although I knew the principles, I hadn’t actually done
things at a higher level as I thought I had, so it gave me a few problems. I also did
the Noether and Polya series, but actually didn’t finish them because I had a lot
happen. But maybe if there were another series during Year Eleven that went on
with the same issues at a harder level and expanded on the stuff in the other ones,
then that would be more appropriate than some of the stuff in the maths courses in
Years Eleven and Twelve.”

**Senior high school**

The change which occurred when Tom started Year Eleven was quite noticeable.
“Especially in the homework. The courses which were offered were fine for me. I
got every subject I wanted. But because The High School is a small school, in
Physics and Chemistry and 3 unit Mathematics we lost face-to-face lessons because
there are not enough teachers to provide the full timetable that we’re meant to have,
and also my 3 unit maths clashes with Design and Technology which means I don’t
have so many D and T lessons to go to. I was doing thirteen units, but I decided to
drop Indonesian because of the workload and I find languages hard. My teacher
reckons I’m good at them, but they’re a lot of work. I’m sorry I dropped it. It’s
interesting, but I think I’ll be better in my other units.” Tom also studies a lot of
Music outside of school time. Once a month, he regularly travels five hours to get
violin lessons at a level appropriate to his ability.

Tom is a year younger than other students in his grade. He gets on well with most
people in his class. “Some of them, I disagree with their principles and the way they
look at things, but on the whole I get on well with them. I think I get on a lot better
with them than I do with the year below me. I think I am more suited to the older
students. My closest friends attend a conservatorium of music.”
Tom's reflections on education

"Completing my schooling a year quicker than what I might have done means I'll be a year younger when I leave school. Either I can take a year to do nothing and laze around, or I can get a job a year earlier and start earning money while other people my age are still at school. Either way I come out better off. Rather than spending my younger years at preschool or something, I can have that same year, I can just wrap it up and bring it out fifteen years later when it is more useful. It's a good investment."

"Just skipping a year met my needs. All the stuff they were doing in Year One, I had already done with my dad. He started teaching me when I was three and a half. I could read when I was four sufficiently, and I knew most of my multiplication tables by the time I was five. Acceleration worked out well for me. I didn't see any disadvantages in acceleration."

"I would have liked the opportunity to have more music lessons. For that I have to live in a big city, or I have to commute to a city, and I do not have the time or the money to go up there more often than about once a month, so it's not often I have those lessons. I think my music might have developed a bit more if I had been able to do that."

"I don't see how on a school's budget they could have provided for me better. They don't have the teacher resources to provide a full line for only a few students. I think the school should be able to apply for more funding from the department if they feel that a class is not doing as well as they could because they are missing out on lessons. The things I did with my mathematics teacher helped a lot with my maths development especially, which I guess also helps in some of the other subjects,"
because they’ve enabled me to look at some of the problems mathematically at a more advance level.”

Tom thinks that, if there had been the provision of support specifically for gifted students, for example to help with paper work, then he would have been able to take advantage of it.

“My biggest regret about acceleration was with the HSC Music. If I hadn’t accelerated, I probably would have still done a lot of accelerated work because my parents helped me out a lot with that. But school would have been a lot more …. It would have been a problem doing work below my level at school. I probably would not have done as well as I have. I would have found it very boring, and I would have stopped paying any attention, really, whereas I think I’m better off being challenged a little bit all the time, because that allows me to keep interested and to keep working. It’s an issue of competition as well.”

“I think marks are important. Universities and so on don’t care about what potential you have. They want you to work and to perform. I think I’ll get a higher UAI because I accelerated, because I would not have done any work, and actually got behind from being ahead, and that would have disadvantaged me in the end. I can’t really imagine not having accelerated.”

Tom has now completed Year Twelve and his HSC. He would very much like to become a pilot in the Air Force, and therefore he was disappointed in his poor performance in the HSC examinations, which resulted in a university entrance mark well below his personal expectations. In the new year, he telephoned me and needed to have a long chat. He was elated. The University of New South Wales had just
offered him a scholarship, set aside for rural students, which would enable him to study aeronautical engineering.

**Tom’s theses**

1. Academic acceleration is an important, viable and already available option, and goes a long way towards meeting the intellectual and social needs of gifted students. It gives increased choice to those who take advantage of it. Enrichment is also important, and needs to be relevant, at a high level, and supported by good quality resource material, and have some form of continuity throughout school from Kindergarten to Year Twelve.

2. Gifted students need a specialist teacher, trained in education for gifted students, to give curriculum and administrative support to them and their teachers.

3. Appropriate high level courses need to be developed for gifted students who have accelerated and completed or met the outcomes of courses ahead of their cohort. The need is greatest for students who have completed Year Ten or HSC courses early.

4. There is a pressing need for financial support and increased opportunities for gifted students from low socio-economic backgrounds and living in rural or isolated situations.

5. Gifted students need smaller, specialist classes, and to be in classes with their peers. In smaller, comprehensive high schools, government funded support is needed to ensure that this happens. There also needs to be greater flexibility in
school organisation, including more flexibility in the timetabling of lessons. It needs to be recognised that classes out of normal school hours may bring hardship to students living in rural and isolated situations.

6. Curriculum needs to be negotiated. Gifted students need to be involved in decision making concerning their curriculum. Teachers of high level courses need to have a say in who may (and, therefore, who may not) participate in such courses. Curriculum for gifted students needs to be fully funded and appropriately resourced.

7. Gifted students need opportunities to mix with like minded peers from other centres.
Case study seven  -  Matha

Matha (pronounced "Ma-ta") was born in March 1986. He was identified for this study because, when he was in Year Seven, he academically accelerated all of his studies, and then a year later he chose to rejoin his cohort. Matha is the youngest of three sons. The family home is about half an hour's drive from Our Town, at the end of a gravel road, and is prominently placed on a spur overlooking tallowwood and stringybark forest. Matha is tall for his age, and has an athletic build. His skin is deep brown, and his hair is black and fuzzy and sometimes worn in many small plaits or adorned with beads.

Family

Matha’s paternal grandfather was an architect, practising in Sydney and Bowral. His paternal grandmother was a speech therapist. When they retired, they generally followed their son, and lived near to where he was living. The grandparents still live “just up the road there”. They have lots of books.

Matha never met his maternal grandfather, who died several years ago. His maternal grandmother, “my apia”, lives in Papua-New Guinea, and has come to stay on four occasions. He does not speak the same language as her, and can only communicate with her using words like “tea” and “coffee”. Matha has not yet had the opportunity to visit her in her village. “Mum has passed on a lot of stories about what used to happen in the village.”

Matha’s father works very hard, seven days a week. He works full time for a forestry company, and works on the farm on weekends. “So he’s working all the time.” He had previously been a lawyer. He studied at the University of Sydney,
and was articled to a law firm which practised in Papua-New Guinea. He enjoyed the diversity of briefs he worked on in PNG, but on returning to Australia he had to do a lot of divorce work which he did not enjoy, and he therefore changed jobs. The family then moved to a farm 25 kilometres from Our Town. Matha’s father worked for the local council, before entering into private enterprise in silviculture.

Matha’s mother grew up in a small village near Buna, in the coastal region of northern Papua-New Guinea. She speaks two languages, and is conversant in a number of dialects and Pidgin. She began university in the second year in which women could attend university in PNG. She graduated with two degrees, in arts and social work. “She’s pretty special.” (Matha believes that his mum was the first PNG woman to graduate, but this is not quite true.)

His parents met when his mother was working as a social worker, and his father was practising law. After they were married, Matha’s mother found that, because she was married to an Australian, she was no longer eligible for promotion, and neither would she be paid at European rates. This prompted their move to Australia, and they eventually settled on the farm where they now live. Since then, they have had three sons, of whom Matha is the youngest. The two older brothers were both strong students academically, and excelled at applied subjects, especially mechanics and electronics.

**Early development**

The only story which Matha can remember about his very early childhood concerns an incident when his brothers placed stockings over his head. He did not have any childhood diseases or illnesses. He learnt to read when he was four, and did not attend pre-school. “I had a fair few jigsaws, and stuff, around to do, and lots of little
books. I remember of an afternoon, maybe three, four times a week or something, my brother would take me outside with a book and help me to read that.” There are many books in the house, several walls are taken up with bookcases, and boxes of books lie around in corners of rooms and on the verandah.

When he was six, he started Kindergarten, and attended infants and primary school at the Convent in Our Town. “I remember a bit from school, but mainly times when I hurt myself and stuff like that. Pretty normal, I think. We had a book club at school, and you read a lot of books like that. Just about everything. At home, I used to watch my brother pulling apart radios and things like that when I was younger, and it aroused my interest a bit, but I didn’t get into it until I got older. I got more interested in mechanical things when I was about twelve. I usually topped my class in most subjects. I was always the best at maths. In Years Five and Six, you were given a maths book and you just worked at your own pace. I remember finishing the book before everyone else, and I didn’t have to do any maths for the rest of the year. They gave me sheets instead, which was all extension work, so I suppose it helped me a bit. That was enjoyable.”

**High school**

“When I was in Year Seven, everyone was just that much bigger than me. I couldn’t believe it. And the school was huge. Having to change classrooms, and carry your gear around with you, was a bit of a change for me, I suppose. I always got along with other people pretty well. Playing sport helped me a bit with that, too. People sort of respect you if you are good at sport. From watching my brothers play, I got interested in basketball. I played a bit of soccer as well. When I was in Years Five and Six, I started beating everyone at running. Sport is better at high school. I get to go to a lot more places and play other schools more often. I’ve represented the high
school at basketball, soccer, volleyball and athletics. I got to state in athletics, in short to middle distance events, but I broke my ankle. In basketball, I was playing for the under fifteens and I was fourteen at the time. I was hoping to get selected for the state representative team, but I broke my ankle in the last game. On weekends I play a bit in the open age group, but everyone is that much bigger than me. This year, I was surprised to make the region under eighteen team. The bloke there was quite impressed, and he was a bit shocked when I told him I was only fifteen. The support from the school is alright, I suppose. I know that the number of people playing basketball is decreasing. I’ve got a couple of older boys to play with at our school. I find that most of the people I’ve met playing basketball are pretty decent sort of people. I get along well with people through sport. That is the main way that I meet people. Sport helps me with my relationships with other people.” Eighteen months ago, the school basketball courts were closed by the Department for Education because they were deemed to be dangerous. A campaign by the community has failed to convince anyone to satisfactorily solve this problem.

Relationships with some other students in class are not quite the same. “Some of them give me a bit of crap for being smarter than them and that, but usually when it comes around to test time they get strangely friendly. I don’t really let that get to me, any more. When I was younger, it got me down a bit. They used to always call me ‘Dictionary’ at school, because I had a reasonably large vocabulary. I knew it wasn’t a bad thing to be smart at school, so I wasn’t ashamed of it.”

“I found that most of the work that I was doing in Year Seven was generally the work which I’d been doing in Year Six.” On the advice of all of Matha’s teachers, the principal asked him if he would like to accelerate a year. The change happened about Easter during Matha’s Year Seven. “I thought it was good to go up a year. I
wasn’t really sure what it would be like. I wasn’t sure how hard the work was going
to be, and how I was going to fit in with all the other students. When I went up, I
was fine. The work was more difficult, but it wasn’t anything I couldn’t handle.
There were a couple of other students my age who had started school a year early. I
didn’t have as many friends in that year. I don’t think it was because I just didn’t get
along with them. It was just the sort of people I met weren’t the sort of people that I
would get along with as well as the friends that I’d been with for most of my school
years. I generally hung out with my own friends in my own year at lunchtimes and
recess.” Here Matha has enjoyed some poetic licence. He tended to spend his recess
and lunch time on the basketball courts, playing with other students from all years,
and in fact a majority of them were senior students.

“I was a bit restricted in my access to VSO courses, because I was coming into the
year late and a lot of the classes were already full. I got it pretty good, because no
one else in Year Seven got electives that year. Some of the subjects I didn’t go so
well in, but that was because of a lack of my application. I found that this year if I
just apply myself I do a lot better anyway.” At the end of his accelerated year, Matha
chose to rejoin his cohort. “It was partly because, at the end of that year, I picked my
electives, and a lot of the ones I picked were already full because I wasn’t there on
the day that every one selected them, and I didn’t really want to waste a full year
doing electives that I didn’t really want to do, and miss out on the ones that I did
want to do. And also, I was just wanting to be with my friends in class. There were
people that I’d sit next to in class, but there weren’t very many of them in Year
Eight, and that sort of affected my academic performance, I think, because some of
the people I sat next to were not the sort of people who try very hard in class.” It is
interesting to note that state imposed changes to the Year Eight curriculum means
that there is now essentially no choice for the students in that year. However, during his two years in Year Eight, Matha was able to gain access to several electives, and at a higher level, which he would not have been able to do otherwise. It is really only the core components of the English, Mathematics and Science which Matha chose to repeat. “Last year I actually got to do a level three course. I wasn’t supposed to do it, but it was just a maths elective. This year I’m doing some level three and level four courses. I am doing some computing courses and some electronics now. My academic needs are being met. Interests could do with a bit of work. But that’s just the number of courses that get run. My English teacher is very good. I’m doing quite a lot of essays and getting pretty good at them now. My maths teacher is pretty good as well. We get to work at our own pace, and he is really good at explaining things if we have any problems with them. After accelerating, I didn’t regret having to do the core subjects again. I had different teachers both years, I got to revise all my work, and I covered most of the work that I was supposed to do in Year Seven.”

Matha’s reflections on education

Matha thinks that he will now probably follow the normal curriculum. “I might do a bit of stuff at TAFE just to do a bit of hands on stuff. I might still do an HSC subject early. It depends on how I go. I’m doing reasonably well in my studies at the moment, and I’m quite happy with that. I’m trying to work out some long term goals, and have something to aspire to. After I broke my ankle, I became a bit more aware of my body’s limits, and I don’t feel so invincible any more. I know that if I want to become anything in a physical line of work, I have to start training now. I don’t really want a nine-to-five job. I’d rather an outdoors sort of job.”
Compared with the traditional approach to curriculum, Matha thinks that the VSO is much better, because he was sharing classes with older students. He has topped a couple of these classes, and enjoyed the competition. When he has completed all of the available higher level courses that he wants to do, he thinks that he will broaden his curriculum and do cooking and applied basic things. "With the number of students, the number of teachers, and the capacity of the school, it's probably a bit much to ask to do even higher level courses. If it were possible to get higher courses in VSO, I'd like to do that. I'd like to do electronics: there used to be four courses in electronics, but now there are only two. Computing Studies is still there, so I'm quite happy with that. I might like to do electives in Maths and Science."

Unfortunately, changes to the VSO have greatly reduced or completely removed the electives in English, Mathematics and Science.

Matha has found that the school's communication concerning the VSO has been appropriate. "I read through the year book this year for the first time and worked out what was on offer in the courses. That explained things pretty well to me." It is a shame that he did not have the opportunity to do this at least a year earlier.

Apparently, there has been no communication concerning alternative HSC pathways, or alternative courses when a high level VSO course has been completed early.

Matha finds the pacing, scope and spiralling of courses appropriate for his needs "as long as you don't do too much revision".

When asked if there is anything else school could do to meet his needs, he says, "Give me free food." "I think the school's done quite well. I'm learning quite a bit this year, and I'm pretty happy. And it is providing some sort of a challenge." He is very happy that he can keep his options open, and he may choose to accelerate in an HSC subject when he is in Year Ten.

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Matha’s theses

1. Gifted students need opportunities to meet and mix with peers. This is especially true for gifted students from rural and isolated areas.

2. There is a need for improved communication about curriculum options, including acceleration, available for gifted students in high school. This should include feeder schools as well as students and their caregivers.

3. Academic acceleration does give access to higher level, more conceptually difficult work, and does significantly increase the options which a gifted student has. If gifted students are to be offered acceleration options, it should be ensured that they thereby gain access to courses which best meet their needs. Acceleration is best offered as an integral part of the school’s curriculum, and changes should take place at appropriate times (for example, at the time of transition from Year Six to Year Seven). Appropriate teacher, administrative and counselling support is needed for students who accelerate. If, after accelerating, a student chooses to rejoin their cohort, they should be able to access this same teacher, administrative and counselling support.

4. Accelerated students need continuity in their curriculum. When gifted students have completed highest level (level 4) VSO courses ahead of their cohort, there is a need for appropriate high level courses which follow on naturally. These could be included within the VSO, and should include TAFE and Preliminary HSC courses. “Interest” courses, autonomous learning classes, and specialist high level classes could be run, and, depending on need, should be funded by the Department of Education.
5. Revision is not necessarily needed by gifted students. Courses which contain common components should be restructured. Provision should be made for gifted students which allow them to show advanced standing in a course or that they have achieved some of the outcomes of a course, and changes made to their curriculum accordingly.
Gekko was born in Sydney in September 1987. He chose his pseudonym for this case study from the name Green_Gekko which he gives to his virtual reality persona. He was identified for this study because he has accelerated his schooling by one year by skipping a grade, and has accelerated in Mathematics by two years. He is the younger of two boys. His sibling is two years older than he, and is a year young for his grade, having accelerated his schooling by one year during primary school by skipping Year Four. Gekko is a very shy person, is very sensitive, and is very easily embarrassed. He is a person of very few words. Things said to him are usually taken literally. He appears to lack confidence in social situations, and often appears to be “off in a world of his own”. He spends a lot of time playing on his computer at home. He enjoys tennis, and plays a strong game of chess.

A Canadian background

Gekko’s grandparents are Canadian, and he remembers only sketchy details about them. His paternal grandfather is now incapacitated because a couple of years ago he suffered a stroke. He is cared for by his wife. Gekko’s maternal grandfather worked with wood and had a big workshop. His maternal grandmother died about ten years ago. The grandparents have all visited the family in Australia.

Gekko’s father grew up in Canada. He studied forestry at university, then worked in forestry research for a few years. While he was studying and carrying out research, he learnt a lot about computers, and eventually moved into private enterprise. He now works, from home, as a computer programmer. “He works with computers, and he is a farmer, but that is a hobby because he doesn’t make any money.”
Gekko’s mother also grew up in Canada, and was a good athlete at school. She was university educated, studying education. She completed neither her degree nor her teaching qualifications, because she married and followed her husband to Vancouver Island where he was doing his research. She is now a farmer and housewife, does a lot of work for the community, and is a pianist.

Gekko’s parents met at university, and married when they moved to Vancouver Island. They then spent several years travelling and living in several places, including Sydney, Melbourne, and, for about one year, in Great Britain, before deciding to migrate to Australia. They bought a farm fifteen kilometres from Our Town, and settled there with their two sons. They built their own house, which nestles into the top of a ridge and commands a spectacular and uninterrupted view across rolling farmland and forest. Throughout the house, there are lots of books: books on computing and the sciences, and novels, in particular the ones with which Gekko is most familiar, science fiction and fantasy. A grand piano has pride of place in their lounge room.

**Early development**

Gekko believes that there were no problems associated with his birth, and that his early childhood was free from illness and disease. However, he is asthmatic, and about once a year suffers from a major attack for which he needs medication.

When Gekko was four, the family moved to Great Britain to live for one year. It was there that he attended preschool, and learnt to read. On returning to Australia, for two years he attended infants school at a public school in Sydney. When he was in Year One, he was placed in Year Two for English “because I was smart”.

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It was then that the family wanted to move out of the city, and to live on a farm. They settled on the property where they now live. Gekko therefore continued his schooling at the public school in Our Town. It takes about half an hour to travel by bus to school. By the end of Year Two, Gekko was doing Year Four work. He remembers wanting to move up a year, and, in agreement with his teacher and his parents, at the end of that year he skipped Year Three.

When Gekko was in Year Five, he was in a composite class with Year Six students, and he was able to complete two years of mathematics work within one year. Therefore, when he was in Year Six, his teacher contacted The High School, asking for help. A mathematics teacher became Gekko’s mentor, and has worked closely with him for the past three and a half years.

In discussions between Gekko, Gekko’s parents, the Year Six teacher, and the mathematics teacher, it was decided that Gekko should not attend Year Seven Mathematics lessons at The High School, because that would mean having to cross the busy main road that separated the two schools, and because Gekko often experienced difficulties when he was placed in new situations. However, the Year Six teacher agreed to help him work through the Year Seven syllabus. Also, once each week, the mathematics teacher went across the street to the primary school and gave intensive, one-on-one mathematics and problem solving lessons to Gekko in the deputy principal’s vacated but messy office. Gekko felt extremely uncomfortable being withdrawn from class for this lesson, thought that the mathematics teacher was “strange”, was bored or frustrated or overwhelmed by the content or the format of the extension mathematics which was presented, and much preferred working alongside his friends in class. Gekko and the mathematics teacher came to a mutual agreement that these lessons should cease.
At the same time, he thought that his Year Six teacher was “foolish”. “I didn’t like him. And he liked me excessively, and that embarrassed me, at least at one point, when he kicked me out of the class.”

During the course of that year, Gekko also competed in the Year Seven Australian Mathematics Competition, just missing out on a High Distinction, the Junior Mathematics Challenge, being placed in the top ten percent of Years Seven and Eight students, and the Euler series, for which he received a Distinction.

Looking back on this year, Gekko still clearly remembers the uncomfortable situation in which he found himself placed, but he does not know what kind of help would have been most appropriate for him then.

**High School**

Gekko was eleven when he started high school. He completed the normal courses for Year Seven, except that he attended Year Eight Mathematics lessons. He felt comfortable in this situation because he knew some of the students in the Year Eight class. Timetabling problems meant that he missed mandatory Year Seven Music and Art lessons, which he completed independently at home. It also meant that he had several free periods each week, which he had to spend in a busy and noisy library.

When Gekko was in Year Eight, he completed the normal courses for Year Eight, except that he studied the Year Nine Advanced Mathematics course, and he was able to choose four VSO courses, of which one had to be a Mathematics course. Timetabling problems meant that the Year Nine Mathematics class clashed with compulsory Year Eight courses. Once a fortnight, after school hours, he met with the mathematics teacher for intensive, fast-paced lessons which covered the Year Nine Mathematics syllabus as well as extension work. He found the arrangements made
for him were not satisfactory. He felt very uncomfortable working independently, 
resented the expectation that he would do extension work, and felt that the 
imposition of attending a class after school was asking too much.

I did the Advanced Maths by myself in the library, or not, as the case may 
be. I met up with my teacher every fortnight to discuss my maths. For a 
starters, I was doing my maths in the Library and got distracted very easily. I 
couldn’t ask questions at any time. I had to do extra work. I had to meet up 
with my teacher after school, when I could have been at home relaxing. 
Clearly, if a Year Eight elective had been on at the same time (as Year Nine 
Mathematics), I could have not done an elective.

Nevertheless, looking back on this problematic year, he is still happy that he had 
accelerated his Mathematics and was doing this subject at a level appropriate to his 
ability.

An exceptional student

Towards the end of his Year Eight, Gekko was incapacitated by a debilitating 
condition. He was absent from school for about half of term four, and, until the end 
of the summer vacation, was unable to read or write or concentrate. He was under 
heavy medication for most of this time, and was regularly seeing a psychologist in 
the regional city.

When Gekko was in Year Nine, changes to the VSO structure mean that he had very 
little choice in the electives that he was doing. One of his VSO courses he found 
exceedingly boring, “It’s crap!” (sic), and he thinks that his time would have been 
better spent if he was doing extra mathematics instead.

He has been studying Year Ten Advanced Mathematics. Again, timetabling 
problems meant that his Mathematics classes clash with compulsory Year Nine 
courses. He therefore attended a Mathematics class with Year Twelve Extension 1 
(3 unit) Mathematics students. During free periods, he had access to his mathematics
teacher for as long as was needed, and he often worked alongside senior students who were in the library at the same time. He related very well with the older students, and found this arrangement quite satisfactory. He found having a teacher available gave him a much more disciplined approach to his work and more closely met his needs. However, he also felt that it would have been better if he was sitting in with the Year Ten Mathematics class. He attained by far the highest mark in every Mathematics test.

During the course of his Year Nine, it became clear that Gekko’s debilitating condition had not gone away, and had worsened. In fact, he was diagnosed to be suffering from a severe case of Obsessive-Compulsive Disorder. This manifests itself in repetitive behaviours, of which he is conscious, and for which he is powerless to do anything. Reading past one sentence and writing more than a couple of symbols become enormous tasks. Naturally, he is extremely frustrated by his inability to concentrate on a single, simple thought without the cycle of repetitive behaviours setting in. He also feels a high level of anxiety in exams and in social situations.

In a term three Mathematics test, his teacher read the script and acted as an amanuensis for Gekko, and extra time was given. The topic was trigonometry, which the class had just finished but which he had covered several months previously. While under test conditions, he sweated profusely, which turned his test paper to pulp, made only a couple of illegible notes on a scrap of paper, invented angles less than $0^\circ$ and greater than $360^\circ$, which he had not met before, hence giving an infinite number of solutions to problems, and made only one trivial error to outscore his nearest rival by about thirty percent. In similar circumstances, but
without the amanuensis and without the extra time, he sat for the Australian Mathematics Competition and attained a High Distinction.

Gekko has actively sought help to overcome the problems his disability brings to his learning. He was absent from school for most of term four, spending the time in an adolescent psychiatric unit in Sydney, seeking ways to manage his disability. He also has asked for a Teacher’s Aide, to read and to write for him, and requested some curriculum modification and support. The process of formally applying for this support proved to be quite traumatic and upsetting for Gekko. The response from the Department of Education appeared to be slow and dictated by other factors, which, Gekko felt, was almost as frustrating as his condition. At the end of term four, Gekko’s application for support was successful. However, the nature of the support is rather limited.

**Gekko’s reflections on education**

Gekko likes the potential strengths of the VSO system, but senses that it faces too many restrictions, imposed by both Department of Education curriculum requirements and the limitations of staffing and organising a small school. “The VSO was pretty good last year, where I could select from all the subjects. But they’ve taken away all the English and Maths courses, and limited the Science courses, that you can choose, apart from Core, and that’s crap (sic). Most of the electives are geared towards red-necks. That’s true. And you usually don’t get all the courses you want.” He would like to see elective English and elective Mathematics offered. He would also like to be able to choose from electives in Geography and History rather than be forced to do compulsory core units.
Except for his Year Eight, Gekko feels that the way the school has fitted in with his acceleration pattern has been acceptable. However, he also thinks that it is possible for the school to do a better job. This year, for example, VSO classes in English, Mathematics and Science are timetabled together, so that anyone who has accelerated in one or two of these subjects will immediately have clashes on their timetable. "Maybe there should be different times to have core classes so that you can get advanced. If you could choose from three or four core English classes which are at different times, then you could choose one and during another go to an Advanced Maths."

Gekko believes that his pattern of acceleration was wise, "because I'm good at Maths'. Last year, his academic needs were not being met, "but at the moment they are".

The extra-curricular mathematics and problem solving done with his mathematics teacher "is interesting". "Some of it is probably too difficult, I find. But it would be good to have extra time at school to do a bit of it, a little bit of time, maybe two hours a week. Probably a bit much. No, an hour a week. I mean during class time."

Gekko very much feels the need to relate to peers and to be in a class with friends. One suggestion is to have an autonomous learning class, placed on one block of the VSO timetable, designed especially for students who have accelerated or have completed level four courses, and who wish to complete, with the help of a tutor, higher level courses or appropriate courses that otherwise would not run. "But it would be preferable to have more than one kid in the class so that you could talk to kids."
Gekko knows only two people who have similar academic ability to himself, and they are both older students from The High School. There have been no programmes or excursions for gifted students which would give him the opportunity to meet other students with similar interests and academic ability. “I guess it might be alright to try one.” He also suggests the possibility of visiting or doing work experience at a university. “It depends if I had kids with me. I wouldn’t want to go to a university with heaps of people half a metre taller than me.”

When he is asked for his thoughts about what might be done to help meet his academic needs, Gekko is very reflective. “Smaller classes. Less people in the class. More choice as to when you do classes that you have to do. I guess lunchtime classes, maybe.” When asked if he has any special needs that are not being met, he immediately replies, “I assume you are talking about school.” He has a very subtle wit. “Yes! It is not a need, it is a want. I’m doing an elective class which I don’t enjoy, and I want to have a free period instead of that class so that I can do work for other classes. So I don’t have to do as much homework.” When asked if there are any other reflections on what the school might do for him, he says, “Give me money. Be sure to include that in the thesis. Probably could have a teacher talk to me more often and during school time, instead of after school.”

He plans to do Preliminary HSC Extension 1 (3 unit) Mathematics when he is in Year Ten, and HSC Extension 1 and 2 (4 unit) Mathematics when he is in Year Eleven. He has not yet thought about the possibility of completing other HSC courses, say Computing Studies, at the same time, but this is certainly a possibility. When he is in Year Twelve, he hopes to study English, Computing Studies, Business Studies or Economics, and Drama. He has also not yet thought seriously about the possibility of beginning university studies during that year, but he does see that as
being one of his options. “I could study for the other courses. Or I would probably get another course. It depends on how difficult the other courses are, because it would be nice to get a free period to study for other courses.”

Gekko is also poignantly aware that his compulsive-obsessive disorder may yet prove to be too much of a disability and may prevent him from realising his potential.

**Gekko’s theses**

1. Academic acceleration is an appropriate response to meet the academic needs of gifted students. It should give more choice to gifted students, but needs to be supported by a more flexible timetable. Accelerated students would benefit from a timetabled autonomous learning class with access to a specialist teacher or tutor during school time. Gifted students require access to a quiet and peaceful resource centre or specialist room for independent study. Extension work, including work done with a mentor, needs to be a formal part of the curriculum offered to gifted students and should be done during school time.

2. Gifted students need: teachers trained in the education of gifted students; counsellors trained in the psychology of gifted students; appropriate high-level curriculum in class, preferably with peers; access to specialist teachers; and opportunities to meet gifted students from other places and to spend time with intellectual peers.

3. There is a pressing need for appropriate support for gifted students with disabilities. Gifted students with disabilities need Teacher’s Aides who are trained in the education of gifted students, who are able to keep up with a higher level of
abstract thinking, and who are conversant with specialist language and symbols (as one would meet, for example, in Extension 1 and 2 (3 and 4 unit) Mathematics).

Application procedures for educational support should be less traumatic, and should not be governed by the school year. It needs to be recognised that high intellectual capacity and high academic ability may indeed be a disadvantage or disability in the traditional curriculum.
"If a man does not keep pace with his companions, perhaps it is because he hears a different drummer. Let him step to the music he hears."

(H. D. Thoreau.)
Discussion and Findings

The people who participated in the study have attended The High School over a period of sixteen years. During this time, there have been about 1600 students enrol at the school. The participants, therefore, represent approximately one half of one percent of the school's population. Their case study narratives explore in depth the formative and educational lives of eight gifted people from seven families.

Families

Families of gifted children have been considered in American studies (Moon, Jurich and Feldhusen, 1998; Silverman, 1997), and, in part, in the Australian study by Gross (1993). These studies highlight the important influences which the family environment has on the emotional and social development of a gifted child.

Seven out of the eight case studies come from “functional”, stable families. The parents of the other case study separated before he was three years old. He lived with his mother and her partner until leaving school, and, during school holidays, he regularly travelled by train and bus to visit his father who lived about one thousand kilometres away.

In four of the seven families, neither parent is in full time employment, and five families would be considered to have a very low household income, lower than the median for this area. Five of the families live out of town in a rural or bush setting. Two of the families, which include three of the case studies, do not have mains power connected to their homes. One family had the telephone connected to their home just before this study took place.
Most of the grandparents of the case studies did not receive any tertiary education. In two families, one grandparent completed a university degree, and in two families, two grandparents completed university degrees.

However, most of the parents of the case studies were university educated. In six of the families, at least one parent has completed a university degree, and in three families both parents have completed a university degree. In the other family, the mother began tertiary studies after her youngest child had started school. None of the parents have post-graduate qualifications.

*The case studies support the notion that gifted students come from diverse family, geographical, and social contexts, including backgrounds of disadvantage such as low socio-economic status, rural isolation, and ethnic minority.*

*They also strongly suggest that a supportive family environment, and a family history of university level education, may be conducive to high academic achievement by gifted children.*

**Gender issues**


Two of the case studies involve siblings. Five of the case studies come from families with two children. Three are the older or oldest sibling, and the other five are all the younger or youngest sibling. There were very few problems associated with their pregnancies and births, and any problems were minor. The case studies experienced
few childhood diseases. Three of the case studies are asthmatic, and two of these occasionally require hospitalisation because of it.

Two of the eight case studies are female. Kerr (1997) highlights the issue of underrepresentation of girls identified as academically gifted. Benbow (1983), for example, has found that sex difference is evident in upper ranges of mathematical ability. Dehaene (1997, pp. 158ff.; cf. Leder, 1993) notes that the gap which separates the mathematical scores of males and females is small compared with the impact of educational strategies, and remains convinced that the prejudices which society conveys about gender are largely responsible for most differences.

The intergenerational data in the case studies reveal aspects of the repeated and systemic exclusion of women from an education which helps them to attain their potential. General women's issues are starting to be addressed in Australia with studies, including a large scale longitudinal study on young women's aspirations, at the Research Centre for Gender and Health, University of Newcastle, and federal policy advice. However, there do not appear to be any Australian studies concerning women and giftedness (Lee, 2002, personal communication.)

Recommendation 1. There is a need for both national and state policies that specifically address the educational needs of gifted female students, and for the development of appropriate structures and mechanisms to support these policies.

Books, books, and more books ...

Seven of the eight case studies were early talkers. The other person, who first talked at three years of age, comes from a family of very low socio-economic background and whose parents separated when he was two years old.
All of the case studies were early readers, with seven learning to read at three, and the other learning to read at four years of age. Jackson (1992; cf. Jackson & Klein, 1997, pp. 462f.) claims that this is certainly not surprising, considering the strong link evident between language and reading acquisition and abstract reasoning ability.

In six of the homes of the seven families, there are extensive libraries. Some homes have rooms full of books, books piled up all around the house, and boxes full of books scattered around the house and on the verandah. Some of the case studies regularly borrow many books from a grandparent's library. Some of the families have inherited a large number of books from grandparents. All of the case studies make full use of the school and town libraries, and, when the opportunity arises, some gain access to university libraries during school vacations.

This does not mean, of course, that the ready availability of books results in giftedness. Rather (cf. Jackson & Klein, 1997, p. 463):

_the case studies support the notion that precocious reading ability, in an environment which values books, gives gifted children a firm foundation for future learning._

**Schooling**

All of the case studies attended public schools for most of their education. The only exception was one person, who attended a Catholic infants and primary school. Thus, all of the case studies have attended The High School for all of their secondary school education. Living in a rural and relatively isolated setting has meant that five of the case studies have had to travel a long distance by school bus to and from school, for up to three hours each day.

Six of the case studies academically accelerated their schooling. They achieved this in diverse ways, which include thirteen of the fifteen options outlined by Southern

Most subjects accelerated were accelerated by one year. One person accelerated by one year in all subjects, except for Mathematics which was accelerated by two years. One person accelerated by one year in all subjects, except for Music which was accelerated by five years. One person accelerated by one to four years in various subjects.

The three case studies who accelerated during high school did so during Year Seven, at the end of Year Eight, and during Year Nine. The other three, who accelerated in infants or primary school, did so by skipping a grade at the end of a school year. It is interesting to note that each of these three cases of acceleration occurred in another town.

This small point does have some wide ramifications. For example, during the course of interviews, another example came to light of a student, at The High School, who had academically accelerated his schooling. Unfortunately, this person was not able to be included in this study. Lack of knowledge of his situation means that The High School has not been able to properly address his particular educational needs.

Again, a student, who is not included in this study, was identified as mathematically gifted by another school, and he accelerated one year in Mathematics before moving to Our Town. The High School was expected to maintain his accelerated programme, even though this student had very poor problem solving ability, and evidently was not strong in any of Krutetskii's (1976) criteria for mathematical ability (vide supra, p.12).
Recommendation 2. There is a need for state-wide coordination of processes which involve academic acceleration.

High mathematical ability

A high correlation between IQ and mathematical ability, as well as between verbal ability and mathematical ability, was found by Benbow, Perkins and Stanley (1983), and by Dehaene (1997).

Seven of the eight case studies in this study enjoy high ability in mathematics. The other person is not considered to be strong in mathematics, completing only 2 unit HSC Mathematics. However, when a mathematical concept is needed for an application in computing, for example, matrix algebra and transformations, or fractal analysis, this person shows the ability to acquire autodidactically the relevant information and use it to write a computer programme.

Four of the case studies have completed HSC Mathematics at the highest level. Two of these people attained 100% in HSC Mathematics examinations. Each of the four has noted that, even with Advanced and 3 unit courses available, they were not sufficiently challenged in Mathematics until they met the 4 unit (now Extension 2) course in Year Twelve. An excellent model for the fast paced learning of mathematics, called SMPY, is presented in Benbow and Stanley (1983) and Stanley and Benbow (1986), and is adapted for a rural setting by Lunny (1983).

Recommendation 3. A significant number of students might not be challenged in mathematics until they meet Extension 2 (4 unit) Mathematics in Year Twelve. This lacuna in the Mathematics syllabi needs to be addressed.
Problem solving

All of the case studies love solving problems, in the sense of Polya (1954) and Lakatos (1976). For most of them, this means solving mathematical puzzles and problems, but for some it also means solving problems in physics or in computing. Two of the case studies attained 100% in Australia wide mathematics problem solving competitions.

Students gifted in mathematics express the mathematical abilities of Krutetskii (1976) in a way which is markedly and qualitatively differentiated from their peers, and this is measurable in problem solving ability (vide supra, p. 12). The criteria of Krutetskii, I believe, are transferable to domains other than mathematics.

A growing number of educators, mathematicians, and psychologists are appreciating the value of problem solving in the education of gifted students (Australian Mathematics Trust, <http://www.amt.canberra.edu.au/amtomoc.html>; Dehaene, 1997, p. 241; Schiever & Maker, 1997; Thornton, 1998). It must be admitted that this has been known to mathematicians for a long time (Polya, 1954). However, the experiences of the case studies would suggest that suitable problem solving resources are becoming available only in a limited number of specific disciplines and only during part of their schooling.

Recommendation 4. There is a need to develop appropriate high level curriculum support and improved resources in problem solving for gifted students, in a broad range of subjects, from Kindergarten to Year Twelve.

Creativity

In their ability to solve problems, the case studies reflect a certain creativity, which often is not associated with mathematical ability. Creativity is usually understood in
terms of artistic ability or divergent thinking skills (Gardner, 1982; Gruber, 1998; Ramos-Ford & Gardner, 1997). Michael (1983) has highlighted the difficulty in defining creativity operationally, and part of this difficulty lies in a general inability to conceptualise “subconstructs of creativity relevant to problem-solving activities involved in mathematics” (Michael, 1983, p. 43; cf. Sternberg, 1985).

It is questioned (Daurio, 1979, p. 19; Feldhusen, 1994c; Shore & Kanevsky, 1993) whether programmes, which are designed to enhance creative abilities and develop creative thinking skills, are suitable pedagogics for gifted students. As Csikszentmihalyi (1996, p. 1) notes, “It is easier to enhance creativity by changing conditions in the environment than by trying to make people think more creatively.” It therefore seems more appropriate to acknowledge that creativity is a process that unfolds over a lifetime.

All of the case studies show both divergent and convergent cognitive ability (Michael, 1983, pp. 45f.), and are able to transfer creative thinking concepts from one domain to another (Callahan & Hunsaker, 1991). All, and two in particular, have the insight to see into a problem deeply (Sternberg & Horvath, 1998, pp. 184f.), and have heavily enriched intuitions (Dehaene, 1997, pp. 238-245). These two people also showed that they could concentrate on the one problem for several hours at a time, and approach the solution to a problem over several weeks.

It is therefore suggested that educational practice would be improved if “creativity” programmes recognised, developed and enhanced the attributes which the case studies exhibited in their problem solving abilities (cf. Sternberg, 1999, Part IV).
Recommendation 5. General conceptions of creativity, and educational programmes for gifted students which are based on them, need to be set on a firmer foundation. Their ability to solve problems also emphasises the extent to which these people think differently from others (cf. Rogers, 1986).

Four of the case studies demythologise the deep and surface dichotomy (Webb, 1997) by sometimes using surface (memorising) strategies for deep (understanding) reasons. All of the case studies are comfortable working at a metacognitive level (Feldhusen, 1989c, pp. 253ff.; 1994c). Three of the case studies much prefer an autonomous learning style (Betts, 1986), seeking support when it is needed. At least one person appears to prefer to learn by first immersing herself in abstract theory before exploring concrete ramifications of the subject. This is termed a “deconstructionist” approach to learning by Rogers (1996b), who cites Sternberg, although I have been unable to find any further reference to this interesting observation.

Recommendation 6. Much work is needed on understanding how gifted students think and learn, and on making changes accordingly to their curriculum and to the way in which it is presented.

Philosophy

Perhaps not unrelated to their ability to solve problems, all of the case studies love to philosophise. By this I mean that they happily engage in discussion or debate or disputation on thinking, ethics, political theory, religion, logic, and a broad range of other philosophical issues. They enjoy reading philosophical books and articles, for example, the excellent introduction to the history of philosophy, Sophie's World, by
Jostein Gaarder, and essays on ethics, by Peter Singer. One person's favourite book is *The Little Prince* by Antoine de Saint-Exupéry.

Perhaps it may be noted here, that only two of the case studies have strong religious beliefs.

In my opinion, it is most pleasing to see Philosophy included as one of the Distinction Courses. The person who participated in this course found it to be the most enjoyable and rewarding course of her school career.

School based Philosophy courses have been developed for primary school students by the Department of Philosophy at the University of New South Wales (Cam, 1996, personal communication), and for secondary school students, for example, at Heathcote High School (Thompson, 1996, personal communication). Some resource material is available from the Australian Council for Educational Research, and there exists a Federation of Australian Philosophy for Children Associations (ACER catalogue, pp. 71-73). However, apart from the Distinction Course, formalised Philosophy courses, which comprise Board of Study requirements, do not appear to have been instituted anywhere in Australia, let alone afforded appropriate curriculum support.

The case studies clearly suggest that many school students, and, in particular, gifted students, would benefit from the inclusion of Philosophy in their curriculum or as part of their curriculum offerings (cf. Delisle, 1997, pp.479f.; Lipman, Sharp & Oscanyan, 1980.)

*Recommendation 7. There is a need to develop appropriate Philosophy courses for gifted students, Kindergarten to Year Twelve. Gifted students who choose such*
courses would require full support in terms of access, resource material, and trained tutors.

Cultural pursuits

For relaxation, apart from reading, the case studies testify to a limited number of cultural past-times. While at school, one person was heavily involved in classical and jazz ballet, training on weekends and on two week nights.

Four of the case studies play musical instruments. One person made his own guitar under the guidance of a master instrument maker. The other three play two or more instruments, and have taken their performance to a very high standard. All four play predominantly classical music, from medieval recorder and renaissance harpsichord, to eighteenth century violin and nineteenth century romantic piano, to twentieth century flamenco guitar.

The connection between the development of complex cognitive processes, and listening to classical music and learning to play a musical instrument, has been outlined by Hofstadter (1980). It would seem appropriate, then, as the case studies suggest, that learning to play a musical instrument should be an optional component of the curriculum for all students, and, in particular, for gifted students. For example, in Queensland, such music lessons are school based, and students are able to borrow instruments or to pay them off over an extended period of time (Nott, 2002, personal communication).

Recommendation 8. Learning to play a musical instrument should be an integral component of the curriculum offered to gifted students. Students who choose this option might be afforded appropriate support in terms of access to trained music
teachers, costs of lessons and resource material, and, if needed, financial help to acquire their own instrument.

Before leaving school, only one of the case studies was fluent in a second language. Since leaving school, one person has become fluent in French and German. Three of the case studies express concern and regret that they are not conversant in a second language. It is, therefore, because of a very real sense of something lacking in their education that the case studies recommend that most students, and in particular gifted students, be offered opportunities, and be given encouragement and appropriate support, to learn a second language.

Recommendation 9. The learning of a second language should be an integral component of the curriculum offered to gifted students, Years K to Twelve. Students who choose this option might be afforded appropriate support in terms of gaining access to courses, material resources, and enriched learning experiences.

Four of the case studies love playing chess. Three of the case studies spend perhaps an inordinate amount of time on their computers, mainly playing virtual reality games. All of the case studies are proficient and comfortable with information technology. Indeed, three of the case studies have built their own computers from scratch. However, it is interesting to note that the five older case studies use their computers only for applications, such as word processing.

Curriculum for gifted students

All of the case studies are deeply concerned with the issue of a curriculum that best meets the needs of gifted students.

Six people mention, and two emphasise, that work experience programmes need to be more appropriate. They cite their experiences, most of which were quite limited
because of the lack of opportunities available locally. The one person who found suitable placement, first in a university laboratory and then with a master musical instrument maker, remarked enthusiastically how important these experiences were for his intellectual, social and emotional development.

Recommendation 10. Gifted students need access to work experience programmes appropriate to their ability and interests.

All of the case studies refer to the pace, scope and sequence of an appropriate curriculum for gifted students. They carefully make several important observations and recommendations about ways in which their curriculum may be improved.

Firstly, revision is not necessarily needed for gifted students. Courses which contain common components should be restructured. Provision should be made for gifted students to show advanced standing in a course or in a course component, and changes made to their curriculum accordingly.

Furthermore, gifted students need a high level, faster paced curriculum. They need high level, faster paced, specialised courses, delivered in smaller classes with peers, and with specialist teachers or tutors. Such courses need to be offered throughout their schooling. Especially in smaller, comprehensive high schools, these need to be fully funded and appropriately resourced, for which the state Department of Education, and not the local school, should be responsible. Three case studies suggest that one suitable mode of delivery might be “autonomous learning classes” (Betts, 1986).

Again, the need for specialised classes is most felt by gifted students who have accelerated and completed or met the outcomes of a course ahead of their cohort, in

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particular, those who have completed a Year Ten or an HSC course early.

Academically accelerated students need continuity in their curriculum.

Finally, it also needs to be recognised that, within the traditional curriculum, high intellectual capacity and high academic ability may in fact be a disadvantage or, indeed, a disability (cf. Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001, Recommendation 3, Paragraph 2.90).

**Recommendation 11.** Gifted students need high-level, faster paced, specialised courses, delivered in smaller classes with peers, and with specialist teachers or tutors.

**Recommendation 12.** Academically accelerated students need continuity in their curriculum.

**A negotiated curriculum**

Five of the case studies make a clear plea for improved communication about the curriculum, and for gifted students to be involved in decision making concerning their curriculum.

They suggest that communication with gifted students concerning high level courses, compaction of courses, academic acceleration, senior courses, and access to tertiary level courses needs to be much improved and expanded. Such communication should include the caregivers of gifted students, and should also include gifted students in feeder primary schools. They argue that gifted students have a right to know all the possibilities and potentials of the curriculum, and are certainly in a position to understand its ramifications and to make informed decisions about their education.
Recommendation 13. There needs to be better communication about curriculum options and the pathways available for gifted students. Gifted students should be informed about and actively involved in negotiating their curriculum.

School organisation

Seven of the case studies draw attention to the ways in which their progress through the curriculum was hampered by inflexible structures in the education system, in the school’s curriculum, and in the school’s timetable. One student was not allowed to accelerate academically because of inflexible school organisation at the time. Even with The High School’s VSO system in place, the six people who academically accelerated their studies experienced severe disruptions to courses, and limited access to some classes and teachers, due to inflexible school organisation.

The case studies strongly urge that school organisation, at both a state and a local level, becomes more flexible (cf. Braggett, 1985, recommendations 4 & 5). Provision should be made for gifted students to meet the outcomes of courses in non-traditional ways. The highest level courses need to be made available for gifted students. School timetables need to cater for gifted students who have academically accelerated some of their studies, or who are following an alternative curriculum. School resources, including quiet and peaceful study rooms, quiet library space, information technology, and computing hardware, need to be made available for gifted students who follow an alternative curriculum.

The case studies affirm that gifted students need to progress in a natural way through their curriculum, at a pace and at a level appropriate to their intellectual development, their academic ability and performance, and their individual needs.
Recommendation 14. There is an urgent need to develop even more flexible school organisation which will facilitate academic acceleration, compaction of courses, access to higher level courses, and access to tertiary level courses.

**Academic acceleration**

The case studies are unanimous in their emphatic acclaim for the benefits of academic acceleration, and in their unequivocal support of its practice.

They agree that enrichment is important, and needs to be relevant, at a high level, and supported by good quality resource material. It needs to be planned, and to have some form of continuity throughout school from Kindergarten to Year Twelve. Extension work, including work done with a mentor, needs to be a formal part of the curriculum offered to gifted students, and should be taught, if possible, during school time.

Their experiences show that academic acceleration certainly does give access to higher level, more conceptually difficult work. In its various forms, it is an appropriate, available, viable, important, and valuable option for meeting the academic and intellectual needs of gifted students. It also gives increased choice to those who take advantage of it. It is best offered as an integral part of the school’s curriculum. If gifted students are to be offered acceleration options, it should be ensured that they thereby gain access to courses which best meet their needs, and changes should take place at appropriate times.

The case studies noted that, when participating in programmes involving acceleration (both school and university based), they were able, for the first time, to meet with and relate to intellectual peers. They felt more comfortable and much happier in these courses, which tended to be the most enjoyable and rewarding of their school careers.
These positive experiences reinforce the important observation made by Gross (1993, pp. 271ff.) that academic acceleration also goes a considerable way towards meeting the social and emotional needs of many gifted students.

They suggest that academic acceleration needs to be appropriately supported. It needs systemic and community support (cf. Bailey, 1998; Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001, Recommendation 6, Paragraph 3.94). It needs more flexible school organisation (cf. Braggett, 1985). Gifted students, who have academically accelerated, need teacher, administrative and counselling support (cf. Silverman, 1993; VanTassel-Baska, 1989a). If, after accelerating, a student chooses to rejoin their cohort, they should be able to access this same teacher, administrative and counselling support.

Here, the case studies point out that academically accelerated students would benefit from a timetabled “autonomous learning class” (Betts, 1986), with access to a specialist teacher or tutor. They require access to a quiet and peaceful resource centre, or specialist room, for independent study. They also require appropriate certification, more recognition, and better tracking of courses completed.

Furthermore, the case studies suggest that the reasons why academic acceleration is seldom used - teacher antipathy, inflexible school organisation, and lack of communication (Bailey, 1998; Braggett, 1985) - need to be seriously and adequately addressed.

The case studies therefore reject the notion that gifted students do not require access, through academic acceleration, to courses of a more intellectually demanding nature. Rather, they plead for gifted students to be given access to the full range of curriculum options offered through academic acceleration, in
its various forms, and that those who choose to enjoy its benefits be given appropriate support.

Recommendation 15. Academic acceleration is a valid, and already available, educational option which meets the academic, intellectual, social and emotional needs of many gifted students. Gifted students require a curriculum which includes, as formal and integral components, options of academic acceleration. Gifted students who academically accelerate their studies need appropriate support.

Access to tertiary level courses

Three of the case studies were able to access university courses while they were still at school. They completed courses in Computing Science, Indonesian, Latin, Mathematics, and Philosophy, at first, second, and third year university level. Results ranged from Credit to High Distinction. Each of these three people envisage a possible broadening of access to tertiary subjects while still at school. Their experiences accent some of the difficulties and problems which need to be addressed in order to expand the curriculum for gifted students in this way.

The case studies, therefore, support the notion that access to tertiary level courses is an appropriate and natural progression for gifted students who have academically accelerated, and who have completed HSC units ahead of their cohort and at the highest level (Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001, Recommendation 11, Paragraph 3.145). It is an important curriculum option for meeting some of the academic and intellectual needs of gifted students, even those with high ability in a restricted domain.

Furthermore, the case studies suggest that gifted students, who gain access to tertiary courses while still at school, need to be fully supported. Support is needed
financially, with provision of texts, with payment of travel and accommodation expenses for residential courses, and with scholarships to cover the payment of HECS. Support is needed so that they gain access to specialist tutors and resources. Support is also needed in the form of a teacher to help with administrative details, with coordinating courses and programmes, and with the tracking and certification of courses and programmes completed.

Recommendation 16. Gifted students, who have academically accelerated and who have completed a Higher School Certificate course ahead of their cohort, need to be fully supported in gaining access to appropriate tertiary level courses, which are to be seen as an integral component of their senior high school curriculum.

Appropriate support for gifted students

All of the case studies carefully emphasise the deep need for appropriate support to help in the intellectual, social, and emotional development of gifted students.

Their experiences highlight the fact that gifted students need appropriate support for their social and emotional development. Schools need to develop better structures and procedures which remove verbal abuse and prevent ostracism, inflicted on gifted students by other students. Gifted students need appropriate recognition for their achievements, given in a way which is sensitive to their situation. Gifted students need opportunities to meet, work with, mix with, spend time with, and relate to like minded, intellectual peers from other places. This is especially true for gifted students from rural and isolated areas, and financial support is needed to ensure that this happens.

The case studies point out that gifted students need support to enable them to gain access to much needed resources such as information technology, computing
hardware and software, curriculum materials which differentiate the curriculum, and more advanced, specialist textbooks (cf. Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001, Recommendation 9, Paragraph 3.121; Recommendation 20, Paragraph 5.14). They need to experience opportunities offered in large centres, for example, visits to universities, university libraries, and research facilities. This is especially true for gifted students from rural or isolated areas. Gifted students from low socio-economic backgrounds, and from rural and isolated settings, need financial support to ensure that they gain access to these resources and experiences.

The case studies suggest that gifted students need a specialist teacher, who is trained in the education of gifted students, to give curriculum and administrative support to them and to their teachers (cf. VanTassel-Baska, 1989a). Indeed, all teachers would benefit from professional training and development in the education of gifted students (cf. Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001, Chapter 4). Gifted students need school counsellors who are trained in the education and psychology of gifted students (cf. Silverman, 1993). Gifted students need careers advisers who have knowledge of issues concerned with university pathways and career options for gifted students, and who are able to assist in organising work experience placements which are appropriate to their interests and academic ability. Gifted students from low socio-economic backgrounds, and from rural and isolated settings, need financial support to ensure that they gain access to appropriate work experience programmes.

It is also suggested that many gifted students, especially those from low socio-economic backgrounds, and from rural and isolated settings, would benefit from
gaining access to a paid mentor. A programme, different from Mentor Links, and specifically designed for rural and isolated gifted students, needs to be developed.

Furthermore, the case studies suggest that systemic support is needed so that small, rural and isolated high schools may develop and implement individual programmes for gifted students, and may run high level classes with low numbers of students but with a full quota of face to face lessons. It needs to be recognised that lessons out of normal school hours may bring hardship to students living in rural and isolated situations.

The case studies make a plea for financial support, so that gifted students may gain access to appropriate high level courses, including tertiary level courses, at other institutions. This financial support should cover any travel expenses, accommodation at residential courses, textbooks and other resources, and should also cover any HECS fees. This is especially true for gifted students from low socio-economic backgrounds, and from rural and isolated settings.

All of the case studies believe that both the State and Federal Departments of Education have the responsibility to ensure that gifted students, especially those from low socio-economic backgrounds, and from rural and isolated settings, are given appropriate support, including financial support, which is predicated on the needs of individual students (cf. Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001, Recommendation 19, Paragraph 5.13).

Recommendation 17. Gifted students need appropriate support, in terms of policy, enriched educational experiences, access to high level courses, access to specialist teachers and tutors, and resources, to help them in their intellectual, social, and emotional development.
Recommendation 18. Gifted students from low socio-economic backgrounds, and from rural and isolated settings, need financial support to give them access to resources, and to educational experiences and opportunities, enjoyed by others.

Pathological concerns

During the course of this study, it became apparent, as well as a source of deep existential Angst, that three of the case studies are suffering from psychological disorders. One person suffers from Manic or Bipolar Depression. Another was diagnosed to have Asperger’s Syndrome. She was recommended to be classified as emotionally disturbed, and almost dropped out of school before completing Year Ten. A third person has a severe case of Obsessive-Compulsive Disorder.

Simonton (1997; 1998) draws attention to five important observations. Historically, the frequency of various mental and emotional disorders is significantly higher for notable achievers than for the general population. A similar high proportion of famous contemporaries exhibit mental or emotional pathologies. Eminent people are measured to have high scores on the clinical scales of all standard psychometric inventories. Distinguished achievers are usually found in genetic lines that show a conspicuously high rate of mental illness. Pathological disorders are slow to manifest themselves, usually becoming apparent after puberty or in early adulthood (Simonton, 1997, pp. 340f.; 1998, pp. 154ff).

All of this evidence corroborates the basic conclusion that genius-level talents probably reside at the delicate boundary between a healthy and an unhealthy personality. Furthermore, ... this precarious location is not incidental. There actually are advantages that accrue to individuals who lie at the edge (Simonton, 1997, p. 341).

A lot of research has centred on the psychopathology of depressive disorders (Cicchetti & Toth, 1998), and to its treatment and prevention (Roberts, 1999).
Government policy advocates integration for all students with emotional disorders, even though the regular classroom does not appear to be the optimal learning environment for them (Bradshaw, 1998; O’Connor, 2001, personal communication). Hasthorpe (1995) has developed an intervention programme for learning-disabled gifted students, based on teacher perceptions, and mainly concerned with the underachieving gifted student.

Since three out of the eight case studies have experienced severe mental and emotional difficulties, it must be questioned whether this proportion is in any way indicative of the general incidence of pathological symptoms displayed by gifted students. If so, then this is a serious problem which needs to be addressed immediately.

Each of these three case studies makes a plea for appropriate support. By appropriate support, they mean four things. School counsellors need to be trained in the specific area of psychology of gifted students. Teachers need to be aware of the particular needs and learning styles of gifted students, of gifted students who are experiencing mental or emotional difficulties, and gifted students with disabilities. Some gifted students require the provision of a Teacher’s Aide, who is trained in issues concerning gifted students, who is able to keep up with higher level and faster paced classes, and who is conversant with specialist language and symbols. Procedures, for recognition and for applications for educational support, need to be more sensitive, and should not be governed by the school year.

Recommendation 19. There is an urgent need for research to be conducted on giftedness and psychopathology.
Recommendation 20. Gifted students who suffer from mental or emotional disorders need to be recognised and given appropriate support.

A model for academic acceleration

This model for academic acceleration has evolved during the course of about a decade (vide supra, pp. 63-66). It has been developed, implemented and refined in response to the perceived needs of a specific group of gifted students. On the one hand, this model has influenced the curriculum which was offered to the students. On the other hand, it has been modified by the experiences of the students as they participated in this curriculum. The final content and logic of the model is informed by the findings and recommendations of this study. The case studies indicate the benefits the model may have for the cognitive and affective development of many gifted students.

The model recommends six steps towards a better curriculum for gifted students:

- Identification
- Communication
- A negotiated curriculum
- Academic acceleration
- Tertiary level courses
- Support for Gifted Students

Identification

My own conception of giftedness is presented above on p. 13. Each school should have its own understanding of giftedness. Identification of a gifted student should imply that educational action will take place. It needs to be remembered that
identification is notoriously unreliable, especially for gifted students from a background of disadvantage. That is one of the reasons why it is important to have a broad, inclusive curriculum, and to have students involved in making decisions about their curriculum.

*Communication*

Gifted students have a right to know the curriculum options and pathways available to them. Information about enrichment programmes, extra-curricular activities, meeting outcomes in alternative ways, high level courses, senior courses, academic acceleration, and access to tertiary level courses while still at school, should be clearly communicated to gifted students, and indeed to all students and their caregivers.

*A Negotiated Curriculum*

Gifted students are in a position to make informed decisions about their education. They should be actively involved in decision making processes concerning their curriculum. Gifted students should be empowered to negotiate their curriculum. This could be attained through a form of mandatory Individual Education Programmes for gifted students.

*Academic Acceleration*

Academic acceleration is valid pedagogics, is grounded in and supported by research, and is an appropriate response to the educational needs of a student whose cognitive ability and academic achievement are several years beyond those of their age-peers. Academic acceleration appears to be the best and most feasible method for providing a challenging, rewarding and continuous education which matches a gifted student’s
academic ability and comes closest to meeting their educational - their intellectual, social and emotional - needs.

Academic acceleration may include: early entrance to school, grade skipping, continuous progress, self-paced instruction, content or subject acceleration, combined classes, curriculum compacting, telescoping curriculum, extracurricular programmes, concurrent enrolment, credit by examination, correspondence courses, and early entrance to university. It is important to note that, in order to provide these options, it may be necessary to change the organisation of the school's curriculum.

*Tertiary Level Courses*

Access to tertiary level courses is an appropriate and natural progression for gifted students who have academically accelerated, and who have completed HSC units ahead of their cohort and at the highest level. Support is needed financially, with provision of texts, with payment of travel and accommodation expenses for residential courses, and with scholarships to cover the payment of HECS. Teacher support is needed to help with administration and coordination, and to ensure access to specialist tutors and resources.

It is perhaps obvious, but important, to remember that, if a gifted student is to enjoy access to tertiary level courses while still at school, they first need to have academically accelerated their studies in at least one subject. Ideally, this should happen, at the latest, before the end of junior high school. This is one reason why careful planning, clear communication, and a negotiated curriculum are very important.
Support for Gifted Students

Gifted students need appropriate support, in terms of policy, enriched educational experiences, access to high level courses, access to specialist teachers, tutors, counsellors and mentors, and resources, to help them in their intellectual, social, and emotional development.

Gifted students from low socio-economic backgrounds, and from rural and isolated settings, need financial support to give them access to resources, and to educational experiences and opportunities, enjoyed by others.

Limitations of the study

It is recognized that a study of this nature has its limitations. Because the participants in the study represented a small and non-random sample of identified gifted students from a small and non-random high school, caution is needed in equating them with the general population of gifted students.

Equally, because I am on close personal terms with each of the participants, there is a danger of aspects of subjectivity influencing the outcomes of the study. However, the trusting relationships that I am privileged to have with these people might also be seen as a distinct advantage, because the participants were very open, honest and deeply reflective in their interview responses.

Recommendations for further research

The twenty recommendations which arise in the Discussion and Findings of this study make, I believe, a constructive starting point for other researchers as well as for policy makers at school, district, and system levels.

There is an evident lack of rigorous research concerning gifted students in rural or isolated areas. The case studies have drawn attention to some of the difficulties
faced by gifted students in such a situation, and it is appropriate that this should be further explored. It is equally appropriate that the advantages, for I am convinced that there are many, for gifted students growing up and gaining an education in such a situation should also be explored.

**Diapsalmata**

A residing refrain resonates throughout the narratives of the case studies:

*Thesis*  *Equity in education may be attained when greater flexibility of school organisation empowers gifted students to negotiate a qualitatively differentiated curriculum, which offers continuity and diversity of choice to access, through academic acceleration, courses of a more intellectually demanding nature, including the possibility of completing appropriate tertiary level courses as an integral part of their senior high school curriculum.*

*Metanoia: the education of gifted students*

It will be apparent that, in this study, “appropriate” is often used, particularly in conjunction with curriculum or educational services for gifted students. It means, of course, “attached as an attribute, quality or right” (Onions, 1978). Implicit, here, is the notion that governments are responsible for ensuring the best possible curriculum, resources, experiences and conditions for the education of gifted students, and these, ideally, are predicated upon the specific needs of individual gifted students (cf. Senate Employment, Education and Training References Committee, 1998, pp. 14-15). It would therefore seem appropriate, also in this sense, that both federal and state governments accept a leadership role in this area (cf. Commonwealth of Australia, 1988, p. 142).
The changes envisaged by the case studies will only be realised if educational leadership gives compatible contextual support (Chapman & Aspin, 2001; Cornbleth, 1990, pp. 178f.; Sturman, 1989, pp. 244ff.). It would be necessary to implement required systemic changes: changes in school organisation, in development and training of professional teachers, and in teacher training. And it would be necessary to change the way people - from administrators and policy makers, to teacher educators, to classroom teachers and curriculum developers, to the wider community - conceive the education of gifted students.

The recommendations arising from the case studies also offer practical and effective suggestions for implementing the changes required to improve the curriculum for gifted students. Most notably, I believe, advantage could well be taken of the current outcomes and pathways approaches to learning by offering a negotiated curriculum through mandatory Individual Education Programmes for gifted students.

Such a reculturing requires a transformation of mind, which I would call a metanoia. I learnt this term from my departed friend Rev. Dr. Alan Lewis, who used to place it, naturally, albeit with a Scottish brogue, within its historical and theological context. Senge (1992) has recently brought this concept back from desuetude by making it central for a ‘learning organisation’. To understand metanoia “is to grasp the deeper meaning of ‘learning’, for learning also involves a fundamental shift or movement of mind” (Senge, 1992, pp. 13f.).

The voices of the case studies offer strong evidence in support of Braggett’s belief, and mine, that gifted students “are possibly the most disadvantaged group ... for they generally have not received sufficient stimulation to achieve their full potential” (Braggett, 1985, p. 5; cf. p. 259). An appropriate curriculum, which is compassionate towards and inclusive of gifted students, and which alleviates the
suffering of isolated and impoverished gifted students, is a moral imperative if social justice is to be realised. If our premise, that each child has a right to realise their potential, is to be taken at all seriously, then a metanoia in education is needed, for the intellectual and psychological well-being of gifted students.
"There is frequently more to be learned from the unexpected question of a child than the discourses of men, who talk in the road according to the notions and prejudices of their education."

(John Locke, *Some Thoughts concerning Education*, 1693.)
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Appendix

“One morning, a train left Central at the published time and travelled the eight kilometres to Ashfield at an average speed of thirty three kilometres per hour, arriving just as the minute hand covered the hour hand on the old station clock. What time did it show on the engine driver’s digital watch?”

(Anonymous.)
Plain Language Statement

Research Project: Appropriate curriculum for academically accelerated students.
Researcher: Peter Merrotsy (Northern Territory University)

Purpose of research project
You are invited to participate in this research project, which is concerned with educational provisions for gifted students. The purpose of the research project is to study the curriculum offered to gifted students in high school, and to study ways in which this curriculum may be improved.

Benefits of research project
It is anticipated that this research project will help high schools provide a better curriculum for gifted students. It is anticipated that it will help gifted students gain access to higher level courses more appropriate for their academic ability. It is also anticipated that it will help in the implementation of a NSW Department of Education policy, to be introduced in 2002, which will enable gifted students, who have accelerated their high school studies, to access tertiary level courses.

What would be expected of you
If you decide to take part in this research project, you will be interviewed at a place that is convenient and comfortable for you. The interview will be audiotaped. You will be asked questions about your family history and background. You will be asked questions about your own history and about your education. You will be asked for your opinions and feelings about your educational experiences. You will be asked for your thoughts on the way in which these educational experiences could have been improved. It is not intended to ask questions which cause embarrassment or intrude on your privacy. Although some interview questions may touch upon family life and circumstances, every effort will be made to avoid embarrassment and to limit the invasion of your privacy. The interview will be used in a case study, which will form part of a thesis for a Doctor of Teaching at Northern Territory University.

Possible discomfort
There is no specific discomfort associated with this research project, apart from being interviewed for an hour or so and having the interview audiotaped. You may feel uncomfortable reliving some of your educational experiences which were painful or hurtful. During the interview, you may take breaks as required, and refreshments, such as iced water, tea, coffee and biscuits, will be made available.

Confidentiality
Full confidentiality concerning your interview and case study will be maintained by me. The audiotapes will be kept confidential, and used only in this research project. Your name, and the names of any people you mention in the interview, will appear neither in the transcript of the interview nor in the thesis. You will be identified in your case study only by an alias of your choosing.

Your participation
I would be very grateful if you did participate in this research project. However, you are certainly free to refuse to participate. Even if you do decide to participate, you may...
withdraw from this research project at any time. Any decision not to participate will make no change to your academic standing or your relationship that you enjoy with the school.

**Results of the research project**

If, at a later date, you wish to listen to the audiotape of your interview, arrangements will be made for you to do so. Also, a transcription of the audiotape will be made, and if you wish to read it, a copy will be made available for you. If, when the thesis is completed, you wish to read the case study formed from your interview, you are welcome to arrange a suitable time to read it.

**Persons to contact**

If, at any time, you have any questions about this research project, please contact me, by telephone on (02) 66 366 190. If, at any time, you have any concerns about this research project or the way it is conducted, you are invited to contact the Executive Officer of the Northern Territory University Human Ethics Committee, who is not connected with this research project, by telephone on (08) 89 467 064. The Executive Officer will pass on any concerns to appropriate officers within the university.

With many thanks

Peter Merrotsy
Plain Language Statement for Caregivers

Research Project: Appropriate curriculum for academically accelerated students.
Researcher: Peter Merrotsy (Northern Territory University)

Purpose of research project
Your child is invited to participate in this research project, which is concerned with educational provisions for gifted students. The purpose of the research project is to study the curriculum offered to gifted students in high school, and to study ways in which this curriculum may be improved.

Benefits of research project
It is anticipated that this research project will help high schools provide a better curriculum for gifted students. It is anticipated that it will help gifted students gain access to higher level courses more appropriate for their academic ability. It is also anticipated that it will help in the implementation of a NSW Department of Education policy, to be introduced in 2002, which will enable gifted students, who have accelerated their high school studies, to access tertiary level courses.

What would be expected of your child or dependent
If you decide to allow your child to take part in this research project, he / she will be interviewed at a place that is convenient and comfortable for him / her. If you wish, you may be present during the interview. The interview will be audiotaped. Your child will be asked questions about his / her family history and background. Your child will be asked questions about his / her own history and about his / her education. Your child will be asked for his / her opinions and feelings about his / her educational experiences. Your child will be asked for his / her thoughts on the way in which these educational experiences could have been improved. It is not intended to ask questions which cause embarrassment or intrude on you and your child’s privacy. Although some interview questions may touch upon family life and circumstances, every effort will be made to avoid embarrassment and to limit the invasion of you and your child’s privacy. The interview will be used in a case study, which will form part of a thesis for a Doctor of Teaching at Northern Territory University.

Possible discomfort
There is no specific discomfort associated with this research project, apart from being interviewed for an hour or so and having the interview audiotaped. Your child may feel uncomfortable reliving some of his / her educational experiences which were painful or hurtful. If this occurs, I will offer your child my full support, and I will discuss the matter with you after the interview. During the interview, your child may take breaks as required, and refreshments, such as iced water, tea, coffee and biscuits, will be made available.
Confidentiality
Full confidentiality concerning your child's interview and case study will be maintained by me. The audiotapes will be kept confidential, and used only in this research project. Your child's name, and those of any people mentioned in the interview, will not appear in the transcript of the interview nor in the thesis. Your child will be identified in his / her case study only by an alias of his / her choosing.

Your child's participation
I would be very grateful if your child did participate in this research project. However, you are certainly free to refuse to allow your child to participate. Even if you do decide to allow your child to participate, you may withdraw your child from this research project at any time. Any decision not to participate will make no change to the academic standing or the relationship which your child enjoys with the school.

Results of the research project
If, at a later date, you and your child wish to listen to the audiotape of his / her interview, arrangements will be made for you to do so. Also, a transcription of the audiotape will be made, and if you and your child wish to read it, a copy will be made available for you. If, when the thesis is completed, you and your child wish to read the case study formed from his / her interview, you are welcome to arrange a suitable time with me to read it.

Persons to contact
If, at any time, you have any questions about this research project, please contact me, by telephone on (02) 66 366 190. If, at any time, you have any concerns about this research project or the way it is conducted, you are invited to contact the Executive Officer of the Northern Territory University Human Ethics Committee, who is not connected with this research project, by telephone on (08) 89 467 064. The Executive Officer will pass on any concerns to appropriate officers within the university.

With many thanks

Peter Merrotsy
Consent Form

I, ........................................... ,
of ................................................................................................ .

hereby consent to participate in a human research study to be conducted by Peter Merrotsy. I understand that this will entail being interviewed, and that the purpose of the research is to address the educational needs of gifted students, in particular, gifted students who have academically accelerated their secondary school studies.

I acknowledge:

1. That the aims, methods, and anticipated benefits of the research study have been explained to me by Peter Merrotsy.

2. That I voluntarily and freely give my consent to my participation in this research study.

I understand:

1. That the interview will be used for a case study for research purposes, and that the case study will form part of a doctoral thesis and may be reported in scientific journals and academic journals.

2. That the interview will be audiotaped. The audiotape and any information I provide will remain anonymous and confidential, and will not be released in an identified form.

3. That details identifying me with my case study will not be released to any person, nor be printed in the doctoral thesis, nor published in a journal, except at my request and on my authorisation.

4. That I am free to withdraw my consent at any time during the study, in which event my participation in the research study will immediately cease and any information obtained from me will not be used.

Signature: ............................................. . Date: ..........................
Consent Form on Behalf of a Child

I, ................................................................. ,

of ................................................................. ,

hereby consent for my child to participate in a human research study to be conducted by Peter Merrotsy. I understand that this will entail my child being interviewed, and that the purpose of the research is to address the educational needs of gifted students, in particular, gifted students who have academically accelerated their secondary school studies.

I acknowledge:

1. That the aims, methods, and anticipated benefits of the research study have been explained to me by Peter Merrotsy.

2. That I have discussed this matter with my child, who agrees to participate in this study.

3. That I voluntarily and freely give my consent for my child to participate in this research study.

I understand:

1. That the interview will be used for a case study for research purposes, and that the case study will form part of a doctoral thesis and may be reported in scientific journals and academic journals.

2. That the interview will be audiotaped. The audiotape and any information provided will remain anonymous and confidential, and will not be released in an identified form.

3. That details identifying my child with his/her case study will not be released to any person, nor be printed in the doctoral thesis, nor published in a journal, except at my request and on my authorisation.

4. That I am free to withdraw my consent at any time during the study, in which event the participation of my child in the research study will immediately cease and any information obtained from me will not be used.

Signature: ................................................................. Date: .................

Signature: ................................................................. Date: .................
A collation of the recommendations

1. There is a need for both national and state policies that specifically address the educational needs of gifted female students, and for the development of appropriate structures and mechanisms to support these policies.

2. There is a need for state-wide coordination of processes which involve academic acceleration.

3. A significant number of students might not be challenged in mathematics until they meet Extension 2 (4 unit) Mathematics in Year Twelve. This lacuna in the Mathematics syllabi needs to be addressed. (Note this has been reworded.)

4. There is a need to develop appropriate high level curriculum support and improved resources in problem solving for gifted students, in a broad range of subjects, from Kindergarten to Year Twelve.

5. General conceptions of creativity, and educational programmes for gifted students which are based on them, need to be set on a firmer foundation.

6. Much work is needed on understanding how gifted students think and learn, and on making changes accordingly to their curriculum and to the way in which it is presented.

7. There is a need to develop appropriate Philosophy courses for gifted students, Kindergarten to Year Twelve. Gifted students who choose such courses would require full support in terms of access, resource material, and trained tutors.

8. Learning to play a musical instrument should be an integral component of the curriculum offered to gifted students. Students who choose this option should be afforded appropriate support in terms of access to trained music teachers, costs of lessons and resource material, and, if needed, financial help to acquire their own instrument.

9. The learning of a second language should be an integral component of the curriculum offered to gifted students, Years K to Twelve. Students who choose this option should be afforded appropriate support in terms of gaining access to courses, material resources, and enriched learning experiences.

10. Gifted students need access to work experience programmes appropriate to their ability and interests.

11. Gifted students need high-level, faster paced, specialised courses, delivered in smaller classes with peers, and with specialist teachers or tutors.

12. Academically accelerated students need continuity in their curriculum.

13. There needs to be better communication about curriculum options and the pathways available for gifted students. Gifted students should be informed about and actively involved in negotiating their curriculum.

14. There is an urgent need to develop even more flexible school organisation which will facilitate academic acceleration, compaction of courses, access to higher level courses, and access to tertiary level courses.
15. Academic acceleration is a valid, and already available, educational option which meets the academic, intellectual, social and emotional needs of many gifted students. Gifted students require a curriculum which includes, as formal and integral components, options of academic acceleration. Gifted students who academically accelerate their studies need appropriate support.

16. Gifted students, who have academically accelerated and who have completed a Higher School Certificate course ahead of their cohort, need to be fully supported in gaining access to appropriate tertiary level courses, which are to be seen as an integral component of their senior high school curriculum.

17. Gifted students need appropriate support, in terms of policy, enriched educational experiences, access to high level courses, access to specialist teachers and tutors, and resources, to help them in their intellectual, social, and emotional development.

18. Gifted students from low socio-economic backgrounds, and from rural and isolated settings, need financial support to give them access to resources, and to educational experiences and opportunities, enjoyed by others.

19. There is an urgent need for research to be conducted on giftedness and psychopathology.

20. Gifted students who suffer from mental or emotional disorders need to be recognised and given appropriate support.
The belief that there is more in our experience of the world than can possibly meet the unreflecting eye, that our experience is significant for us, and worth the attempt to understand it ... this kind of belief may be referred to as the feeling of infinity. It is a sense (rather than an item in a creed) that there is always more to experience, and more in what we experience than we can predict. Without some such sense, even at the quite human level of there being something which deeply absorbs our interest, human life becomes perhaps not actually futile or pointless, but experienced as if it were. It becomes, that is to say, boring. In my opinion, it is the main purpose of education to give people the opportunity of not ever being, in this sense, bored; of not ever succumbing to a feeling of futility, or to the belief that they have come to an end of what is worth having. It may be that some people do not need education to save them from this; my claim is only that, if education has a justification, this salvation for those who do need it must be its justification.

(Mary Warnock, 1976, pp. 202-203.)