GIFTED AND TALENTED EDUCATION

PROFESSIONAL DEVELOPMENT PACKAGE FOR TEACHERS

SPECIALISATION

Module 1

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Australian Government
Department of Education, Science and Training

THE UNIVERSITY OF NEW SOUTH WALES

GERRIC
Gifted Education Research, Resource and Information Centre

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Specialisation Level

Introduction

Welcome once again to the Advanced Training Program of the Australian Government Professional Development Package for Teachers in Gifted and Talented Education.

As with the Core and Extension Packages which you have completed earlier, we want to individualise the Program as much as possible to optimise its relevance and usefulness to you.

Initially you will select from Early Childhood, Primary or Secondary school context. For the purpose of this course we are defining early childhood as all pre-school or school years up to and including Year 2.

Additionally there is content differentiated by:

Role	Classroom Teacher ct ROLE	Executive Staff es ROLE	Principal p ROLE
Location	Urban u LOCALITY	Rural r LOCALITY	
Mode	Self Study ss MODE	Small Group sg MODE	Whole Staff ws MODE

While using the package, you will be able to select content that is applicable to your context.

Thank you! You're now ready to proceed.

Module 1: Understanding Giftedness

The course has examined and analysed three influential models of giftedness, Françoys Gagné's Differentiated Model of Giftedness and Talent, Joseph Renzulli's 'three-ring' model and Abraham Tannenbaum's 'sea-star' model. We looked at some of the ways in which gifted children and adolescents may differ from their age-peers in both their cognitive and their socio-affective development and, in particular, how intellectually/academically gifted students tend to differ in the ways they learn. In the Extension Module we revisited Betts and Neihart's six 'profiles' of gifted learners and discussed how different learning styles could help to explain some of the attitudes and behaviours of these students. We looked at levels of giftedness and the implications of this for program development.

Module 2: The Identification of Gifted Students

We have looked at the principles of effective identification in early childhood, in the primary school years and in adolescence. We examined the principles of reliability and validity and discussed how important these are in selecting identification tools. We discussed how using multiple criteria — a **range** of objective and subjective measures — rather than one test or checklist on its own, can provide a 'safety net' which will catch as many as possible of the gifted or talented students in your school. We have analysed the strengths and weaknesses of teacher, parent, peer and self-nomination and the use of IQ, aptitude and achievement testing and off-level testing. We have highlighted the use of dynamic testing to identify students from disadvantaged and culturally diverse populations. We analysed two different ways of synthesising the valuable data gathered from all these procedures to provide a useful identification matrix for your school.

Module 3: Social and Emotional Development of Gifted Students

This Module has highlighted ways in which intellectually or academically gifted children may differ from age-peers in their emotional maturity, their friendship conceptions, their feelings about their gifts and talents and even their hobbies and interests. We analysed possible outcomes of the 'forced-choice dilemma', for example 'dumbing down' or moderating one's achievements for peer acceptance. We also explored the five forms of 'over-excitability' and noted that students who react more intensely than their classmates to intellectual, emotional or physical stimuli can sometimes be misdiagnosed as having Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD). We looked at how motivation and optimism can influence achievement and we evaluated positive and negative aspects of perfectionism. We explored some issues in parenting gifted students, such as how to encourage task-oriented rather than performance-oriented self-expectations and the importance of building facilitative home-school partnerships. We explored a range of issues in self-esteem and noted that unrealistically inflated self-esteem can be moderated by the experience of working with other students as able as oneself.

Module 4: Understanding Underachievement in Gifted Students

We explored some of the causes of underachievement among gifted students. Boredom, learning disabilities, low teacher expectations and dysfunctional perfectionism were examined. Betts and Neihart's 'Profiles of the gifted and talented' were introduced as a useful framework to identify and understand underachievement. Dynamic Testing was proposed as an effective means of identifying 'invisible underachievers' from culturally diverse and low socio-economic groups. We noted that underachievement often arises from students' own beliefs that they are of low ability or little value and we suggested strategies through which teachers can identify and assist those students. We discussed the links between academic self-efficacy and students'

abilities to persevere in the face of difficulties and we examined some strategies that teachers can use to enhance students' self-efficacy through mastery experiences — including the provision of positive role models. We investigated key factors in underachievement in Australian Indigenous children such as the educational disadvantage experienced by involuntary minority status peoples, and the distrust of, and negative attitudes toward, education that can emerge from this. We affirmed the importance of allowing all underachievers to experience 'flow'.

Module 5: Curriculum Differentiation for Gifted Students

This Module introduced some procedures which teachers can use to differentiate the level, pace and complexity of curriculum delivery for gifted learners through modifying content, process, product and learning environment. We showed how the use of pre-testing, to assess what students already know, allows us to minimise unnecessary revision by compacting the curriculum. Bloom's Taxonomy and the Williams model of curriculum development provide useful structures through which teachers can develop an enriched and challenging curriculum for gifted students, while the Kaplan model provides an excellent scaffold for developing theme-based independent study or research projects. The Maker model provides a vehicle for developing extension activities through differentiating the content, process, product and learning environment and through providing rich tasks and 'real world' problem solving activities for gifted students. We examined some of the research supporting curriculum differentiation for gifted students and explored different ways in which we can evaluate the effectiveness of curriculum differentiation. We noted that different levels of giftedness require different curriculum differentiation strategies.

Module 6: Developing Programs and Provisions for Gifted Students

This Module explored some of the mythologies which have grown up around ability grouping and acceleration and introduced some of the research-based findings that support the use of these procedures for gifted and talented learners. The concept of effect size was introduced as a useful way of representing learning gains through different programs of acceleration and ability or achievement grouping. Several forms of grouping and acceleration were described and their academic outcomes reported. Practical hints were provided to maximise the effectiveness of these programs. The international guidelines on acceleration were introduced to enable teachers and parents to evaluate both a student's readiness for acceleration and which forms of acceleration might be most suitable. We examined both the possibilities and the pitfalls of using cooperative group learning with gifted students. We explored the possibilities of online and group mentoring and its particular advantages for gifted students in rural and remote areas. We explored issues in the development and management of individual education programs which can be extremely beneficial and which are particularly necessary for students of more than moderate levels of giftedness, students who have a learning disability or physical impairment, or indeed any gifted student who is significantly underachieving or at risk of becoming a chronic underachiever.

The Specialisation Level of the Professional Development Package builds on, and expands from, the Core and Extension Packages.

We have not provided pre-tests for the Specialisation Modules as we anticipate that, having progressed this far, you are enjoying the Professional Development Package and will be eager to work through the material that follows.

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Module 1

Early Childhood

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Module 1

Other Issues in Understanding Giftedness

Welcome to Specialisation Module 1: Other Issues in Understanding Giftedness. In this Module you'll be introduced to Howard Gardner's controversial 'Multiple Intelligences' model and some of the arguments for and against it.

We will look at the long history of Talent Searches and describe three current Australian Talent Searches which may be able to assist some of your present students to develop their gifts into talents. Longitudinal studies are extremely valuable as they give us an insight into how gifted young people develop as adults and the impact, in later life, of special assistance — or no special assistance — at school, and we will analyse the findings of several of these.

Some of the characteristics of giftedness in early childhood will be explored further in terms of their usefulness as predictors of later achievement.

Finally, we'll explore some of the research on the learning characteristics of students gifted in creativity, leadership and the performing arts.

Professor Miraca U.M. Gross

Specialisation Module 1: Early Childhood

Other Issues in Understanding Giftedness

Contents

Outcomes

At the completion of this Specialisation Module you will be able to:

- assess the usefulness, for your classroom or school, of Gardner's 'Multiple Intelligences' model.
- evaluate the potential value, for students in your classroom or school, of participation in the Australian Sports Talent Search for students gifted in sport and athletics and the Australian Primary Talent Search (APTS) and Australian Secondary Schools Educational Talent Search (ASSETS) for academically gifted students.
- understand the effects in adulthood, as shown through longitudinal studies, of special school provisions for gifted children and adolescents.
- recognise some early childhood characteristics and behaviours which indicate probable intellectual giftedness.
- understand and respond to the learning styles and characteristics of students who are gifted in non-academic areas.

Part 1

Multiple intelligences — do they exist?

In Extension Module 1, we examined the origin and development of Joseph Renzulli's 'three-ring' model of giftedness. As discussed in that report, Renzulli built his model **not** on the characteristics of gifted children but on the characteristics and behaviours of successful 'creative/productive' adults, particularly the creative architects studied by MacKinnon in the 1950s and the astonishing collection of paradigm shifters in science, medicine, law, literature and other fields whose lives were studied by Sir Francis Galton in the 1860s — men such as Shakespeare, Michelangelo and Newton. Critics of Renzulli's model have pointed out that it is doubtful whether models of successful **adult** productivity — particularly extreme adult productivity — can be generalised to children and used to identify child potential.

Gardner's 'seven intelligences'

A similar problem exists with 'Multiple Intelligences'. In 1983, a neuropsychologist, Howard Gardner, published a book which came to arouse considerable interest — and considerable controversy — in the educational community. *Frames of mind: The theory of multiple intelligences* proposed that there exist 'seven separate and somewhat independent intelligences' rather than one central, generalised capacity to reason.

At first glance this is an attractive and encouraging theory. Surely, the more 'ways' of being intelligent we can identify, the more chance individual children have of being 'intelligent' in one way or another! Teachers want to think the best of their students and they want the best **for** their students. Parents, naturally, want the same for their children. And it is this very natural human wish that life should offer wider opportunities for young people to excel that has caused 'Multiple Intelligences' theory to be embraced with such enthusiasm — particularly in egalitarian Australia.

Nonetheless, there are many problems with 'Multiple Intelligences' theory. Firstly, like Renzulli's 'three-ring' model, it was not primarily derived from a study of children. Gardner derived his theory from a study of brain-damaged adults and his observations of the destruction or preservation of **separate** abilities depending on the area of the brain that had been damaged. For example, singing and speaking appeared to be separate functions of the brain which could be independently lost or spared. Similarly, language skills and spatial orientation appeared to be the function of different parts of the brain. The capacity to relate productively to other people seemed to be sited in yet another area.

During the same period in which Gardner was making these observations he was also working with children who were **not** brain damaged and he noted that, while some of these children seemed skilled in many areas, most seemed to demonstrate greater strengths in some areas than in others. An important maxim for researchers or developers of theory in education, psychology or indeed any other field is: 'Correlation is not causation.' We have to guard against assuming that two factors which seem to co-exist are necessarily causally linked. However, Gardner was influenced by what he perceived as links between the two groups he was studying:

> *'Both of the populations I was working with were clueing me into the same message: that the human mind is better thought of as a series of relatively separate faculties, with only loose and nonpredictable relations with one another, than as a single, all-purpose machine that performs steadily at a certain horsepower independent of content and context' (Gardner, 1999, p. 32).*

In *Frames of mind*, Gardner introduced his 'seven separate and somewhat independent' intelligences. The definitions provided below are taken from Gardner (1999) pp. 41-43.

Linguistic (verbal)
Gardner defines this as sensitivity to spoken and written language, the ability to learn languages and the capacity to use language to accomplish certain goals.

Logical-mathematical
The capacity to analyse problems logically, carry out mathematical operations and investigate issues scientifically.

Musical
This entails skill in the performance, composition and appreciation of musical patterns.

Bodily-kinesthetic
The potential of using one's whole body or parts of the body (eg the hand or the mouth) to solve problems or to fashion products.

Spatial
The potential to recognise and manipulate the patterns of wide space (those used, for instance, by navigators or pilots) as well as the patterns of more confined areas (such as those of importance to sculptors, surgeons, chess players, graphic artists, or architects).

Interpersonal
This denotes a person's capacity to understand the intentions, motivations and desires of other people and, consequently, to work effectively with them.

Intrapersonal
This involves the capacity to understand oneself, to have an effective working model of oneself — including one's own desires, fears and capacities — and to use such information effectively in regulating one's life.

Later Gardner added three additional 'intelligences'; naturalist, spiritual and existential. However, the majority of his writing has been on the original seven.

Gardner was frank and open in acknowledging that he had **no** scientific or empirical basis for his selection of what is, or is not, an 'intelligence': 'The selection (or rejection) of a candidate intelligence is more reminiscent of an artistic judgment than of a scientific assessment. Borrowing a concept from statistics one might think of the procedure as a kind of "subjective" factor analysis' (Gardner, 1993, p. 62).

Perhaps a better description of this procedure could be 'making an educated guess'! However, Gardner was by no means the first to develop a theory of loosely related 'intelligences'.

Thurstone's seven 'primary mental abilities'

Early in the 20th century, psychologist Charles Spearman proposed that there is a general, pervasive human ability, which he called *'g'* — general intelligence — which underpins virtually all human activity. This does not deny that *g* manifests itself differently in different fields of activity, or that different levels of *g* may be required for successful performance in different occupations; it does hold, however, that general intelligence — the capacity to reason — is at the core of all activities which involve the generation of knowledge and the processing of information (Carroll, 1993; Pyryt, 2000). It has usefully been described as 'a highly general information-processing capacity that facilitates reasoning, problem solving, decision making and other higher order thinking skills' (Gottfredson, 1997, p. 81).

In 1938 L.L. Thurstone challenged this widely accepted belief by proposing that there was no central, integrated capacity for reasoning but rather that intelligence comprised seven 'primary mental abilities'. Like Gardner four decades later, Thurstone emphasised that his seven abilities were independent of each other. Prominent among Thurstone's 'primary abilities' were mathematical aptitude, spatial ability, and verbal fluency and comprehension, which also appear in Gardner's 'seven intelligences'. Thurstone did not include 'personal intelligences' however, and he did not consider musical aptitude to be a 'separate' ability, perhaps because it is so closely linked to numerical reasoning and because, for the lyricist in song or operatic composition, it requires both musical and verbal facility.

However, Thurstone's theories came under stringent criticism from other psychologists and statisticians who re-analysed his data through the statistical procedure of factor analysis and reported that, when correctly analysed, correlations were found between several of Thurstone's abilities, suggesting an underlying general capacity to process and use information which permeated mathematical, verbal and spatial ability — Spearman's *g* had struck again!

Gardner's exemplars

As indicated earlier, Gardner's 'Multiple Intelligences' theory was derived originally from a study of adults who had suffered various forms of cerebral damage. For this reason, it's perhaps unsurprising that he uses adults as examples of the various 'intelligences'. What does seem a little strange, however, is that most of the examples he gives are highly gifted men and women; for example, Einstein for logical-mathematical intelligence, T.S. Eliot for linguistic and Stravinsky for musical. However, as Gardner later acknowledged (Gardner, 1999) many of the remarkable, creative-productive adults he proposed as examples of specific intelligences were actually

multi-talented and excelled in several domains. This seems to contradict the very theory he was proposing.

As with Renzulli, we must question whether Gardner's models of successful **adult** productivity — particularly extreme adult productivity — can be generalised to children and used to identify specific abilities in childhood.

'Multiple Intelligences' in Australia

> *'I believe that philosophically, morally, politically and educationally the approach must be that all children have gifts and talents which need to be identified, valued and fostered' (Colanero, 1985, p. 46)*

This quotation is taken from a paper which was originally presented in 1984, in Canberra, at the Australian National Workshop on Gifted and Talented Children from Populations with Special Needs. This conference had a laudable purpose — to highlight the point that gifted and talented children appear in every racial and ethnic group, among children with disabilities, in disadvantaged groups and in remote communities; to give the message, indeed, that wherever children are found we will find gifted children.

Unfortunately, this message was not widely accepted — largely because a view that was very prevalent in Australia during the 1980s was that every child had a gift or a talent. This concept was translated, in many schools, into the belief that since everyone was gifted there was no need to make special efforts to identify 'gifted' students, there was no need for special provisions for 'gifted' students (except where the gift lay in sports or music!) and there was no need for teachers to be trained in how to differentiate the curriculum for 'gifted' students since all were, by definition, gifted. Unfortunately, this confusion between the concept of gifts and and the concept of individual strengths, which we discussed in Core Module 1, was endorsed, and even fostered, in some state education systems. Several states which had provided modest funding for special programs for gifted students withdrew the funds and allowed the programs to lapse.

Gardner published *Frames of mind* in 1983 and over the next few years it was enthusiastically adopted in many Australian schools. Unfortunately in some cases the push towards its adoption was socio-politically motivated, rather than educationally driven or endorsed. Gardner's claim that abilities were separate and unrelated was politically 'highjacked' and re-interpreted as endorsing the view that all children have gifts and talents; all teachers had to do was find each child's 'intelligence'.

In 1988 Abraham Tannenbaum, speaking at a conference organised by the Gifted and Talented Children's Association of South Australia, humorously refuted Gardner's premise of separate 'intelligences':

> *'Unfortunately there are still some people who accept a pseudo-scientific belief that the human mind consists of many discrete abilities and that if you break down these independent abilities and keep on breaking them down, you will eventually reach a point where there are more special aptitudes than there are people walking on the face of the earth. And the logical conclusion and absurdity that arises from this belief is the idea that if there are more aptitudes around than people, then surely each human being must have a chance of possessing at least one superior aptitude. Sadly, however, this is not so. God was not a democrat when She distributed abilities' (Tannenbaum, 1988).*

Tannenbaum was affirming that human abilities are not discrete or only tenuously linked. For example, mathematical ability and musical ability are not two separate 'intelligences' as proposed by Gardner; they are aptitudes which teachers of maths and teachers of music happily acknowledge to be quite highly correlated. Similarly, what Gardner calls 'inter-personal intelligence' — the capacity to understand other people — is closely related to what he calls 'intra-personal intelligence' — the capacity to understand oneself — and indeed a strong relationship between the two is essential for mental health.

> Unfortunately, teachers who adhere too closely to the 'multiple intelligences' theory are reluctant to acknowledge that students who achieve highly in one area of academic work are likely to have the potential to achieve highly in other areas. **Rather than assuming that a specific academic ability exists in isolation, educators should look for unusually high potential in other subject areas.**

In his Adelaide presentation Abraham Tannenbaum noted that students attending elite schools for the musically gifted are generally seen to be academically able. He pointed out that students at New York's Juilliard School of Music are generally well above average in academic, as well as musical, studies. This is still so today. Musically gifted students are not permitted to enter the Cincinnati School for Creative and Performing Arts, which admits students at the age of 10, unless they show additional evidence of significant academic aptitude; they would require this to keep up with the standard of academic excellence set by the school's student body. Radford (1990) reported that the average IQ of students at the Yehudi Menuhin School of Music was 130. Fewer than three percent of people score at this level.

David, in Year 1, was a maths whiz. He seemed to count everything and he loved to find mathematical relationships in things. He came to Mrs Eliot, his teacher, one morning early in Term 1 and announced that the six chairs at 'his' table each had four legs and that was 24 legs altogether and if you counted in the legs of the six students who sat at his table that was 36 legs altogether.

Early in the term Mrs Eliot had been to an inservice day where a consultant had spoken eloquently about Multiple Intelligences. The teachers enjoyed it very much. It was a theory that seemed to recognise the specialness of every child. As one of the inservice activities, the teachers were asked to analyse which intelligence characterised each of the children in their class and then think of activities that might foster each intelligence. Mrs Eliot decided that David's intelligence was logical-mathematical and for the next few weeks she did her best to foster his passion for maths by developing activities in several subject areas which allowed him to use his number skills.

After a few weeks David seemed to lose interest in maths. He fiddled with the materials but wouldn't really do anything with them. He stared out of the window. He watched what the other kids were doing. He kept a book on his lap and read surreptitiously. Mrs Eliot spoke to him gently. 'David', she said, 'Why have you stopped doing maths? I thought you liked maths.'

'I do like maths but not all the time,' said David. 'I like icecream too, but not for every meal.'

Mrs Eliot laughed good humouredly at the analogy. Maybe David possessed linguistic intelligence too!

Over the next few weeks Mrs Eliot looked more observantly at David. She found that once she stopped perceiving him only through the lens of MI theory, she was able to see a whole range of strengths and talents that David possessed. He was an excellent reader, had a keen interest in science and was a talented soccer player. And, ironically, once she reduced the helpings of maths in his diet his love of maths returned!

David, a Year 1 student in your school, was a maths whiz. He seemed to count everything and he loved to find mathematical relationships in things. He came to Mrs Eliot, his teacher, one morning early in Term 1 and announced that the six chairs at 'his' table each had four legs and that was 24 legs altogether and if you counted in the legs of the six students who sat at his table that was 36 legs altogether.

The school's Professional Development Day early in the year had featured a consultant who spoke eloquently about Multiple Intelligences. The staff enjoyed it very much. It was a theory that seemed to recognise the specialness of every child. As one of the inservice activities, the teachers were asked to analyse which intelligence characterised each of the children in their class and then think of activities that might foster each intelligence. Mrs Eliot decided that David's intelligence was logical-mathematical and for the next few weeks she did her best to foster his passion for maths by developing activities in several subject areas which allowed him to use his number skills.

After a few weeks, Mrs Eliot spoke to Ms Jackson, the Principal, in some concern. David seemed to have lost interest in maths. He fiddled with the materials but wouldn't really do anything with them. He stared out of the window. He watched what the other kids were doing. He kept a book on his lap and read surreptitiously. Mrs Eliot asked him what was the matter but he seemed reluctant to talk to her about it. She suggested to Ms Jackson that perhaps she could talk to the boy.

Ms Jackson had a good relationship with David. She spoke to him gently later that day. 'David', she said, 'Why have you stopped doing maths? I thought you liked maths.'

'I do like maths but not all the time,' said David. 'I like icecream too, but not for every meal.'

Mrs Eliot laughed good humouredly at the analogy when Ms Jackson reported back to her. Maybe David possessed linguistic intelligence too, she said!

The next day Ms Jackson had a friendly talk with Mrs Eliot. She suggested that Mrs Eliot had over-reacted to the Multiple Intelligences seminar. It was just one way of looking at children — certainly not the only way. Indeed, it might be unwise to assume that the most visible talent in a child was his or her only talent!

Ms Jackson's advice had a very positive outcome. Over the next few weeks Mrs Eliot looked more observantly at David. She found that once she stopped perceiving him only through the lens of MI theory, she was able to see a whole range of strengths and talents that David possessed. He was an excellent reader, had a keen interest in science and was a talented soccer player. And, ironically, once she reduced the helpings of maths in his diet his love of maths returned!

Howard Gardner in Australia

Gardner has been highly critical of educators who 'highjack' his philosophies for socio-political ends. 'Contrary to much that has been written, MI theory does not incorporate a position on tracking, gifted education, interdisciplinary curriculum, the schedule of the school day, the length of the school year, or other hot-button educational issues' (Gardner, 1999, p. 89).

Should schools attempt to identify and teach to students' individual 'intelligences'? Gardner's position seems to be ambivalent on this. He criticises other scholars who have attempted to devise tests to measure specific 'intelligences' on the grounds that such tests often confuse a child's interest in an intelligence with aptitude or skill in it. Indeed in 1999 he went even further, overtly criticising educators who attempt to identify and teach to the 'intelligences' he proposed 16 years earlier and even seeming to suggest that these 'intelligences' were hypothetical:

> *'I consider it a fool's errand to embrace the search for a "pure" intelligence, whether general intelligence, musical intelligence or interpersonal intelligence. I do not believe such alchemical cognitive essences actually exist; they are an outcome of our penchant for creating (and then attributing reality to) terminology rather than searching for determinable, measurable entities' (Gardner, 1999, p. 207).*

This seems to echo a comment from his first book, *Frames of mind* (Gardner, 1993, pp. 69-70):

> *'Sympathetic readers will be likely to think — and fall into the habit of saying — that here we behold the "linguistic intelligence", the "interpersonal intelligence" or the "spatial intelligence" at work, and that's that. But it's not. These intelligences are fictions — at most, useful fictions — for discussing processes and abilities that (like all of life) are continuous with each other. Nature brooks no sharp discontinuities of the sort proposed here. Our intelligences are being separately defined and described strictly in order to illuminate scientific issues and to tackle pressing practical problems. It is permissible to lapse into the sin of reifying so long as we remain aware that this is what we are doing. And so, as we turn our attention to the specific intelligences, I must repeat that they exist not as physically verifiable entities but only as potentially useful scientific constructs.'*

In his 1999 book Gardner specifically and scathingly criticised a group of Australian teachers who were attempting to teach 'multiple intelligences'. His main concern seemed to be that the teachers were employing not pure MI theory but 'a mishmash of practices with neither scientific foundation nor clinical warrant' (Gardner, 1999, p. 79). He complained that 'left-brain-and right-brain contrasts, sensory-based learning styles, neurolinguistic programming and MI approaches were commingled with dazzling promiscuity. Clearly, no one had separated out the curricular wheat from the extracurricular chaff' (p. 79). The curricular wheat, presumably, was MI theory.

Indeed, as this Module is being written, Gardner has again gone on record describing the use of multiple intelligences in Australian 'accelerative learning' programs as 'fatally flawed' (Slattery, 2005). **It is important to note that he is not referring to the practice of accelerating gifted students.**

Gardner criticises, with some justification, teachers who claim to be using 'multiple intelligences' but who are simply continuing practices they have used for years — but conveniently relabelling them:

> *'I once watched a series of videos about multiple intelligences in the schools. In one video after another I saw youngsters crawling across the floor with the superimposed legend "Bodily-Kinesthetic Intelligence". I said, "That is not bodily-kinesthetic intelligence; that is kids crawling across the floor. And I feel like crawling up the wall"' (Gardner, 1999, pp. 141-142).*

Practical advice from Gardner: Some 'don'ts'

Teachers who plan curriculum along the lines of 'multiple intelligences' may want to heed the following guidelines developed by Gardner. Perhaps we should particularly heed his warning that multiple intelligences are theory only and that this theory has not yet been scientifically validated. In particular, we should be aware that children who possess high ability in one domain of learning are **more likely than not** to possess high ability in at least some others. Within Gagné's framework, this could be expressed as: 'If a student shows **talent** in one subject, look out more closely for **hidden gifts** in other subjects!'

Gardner's guidelines

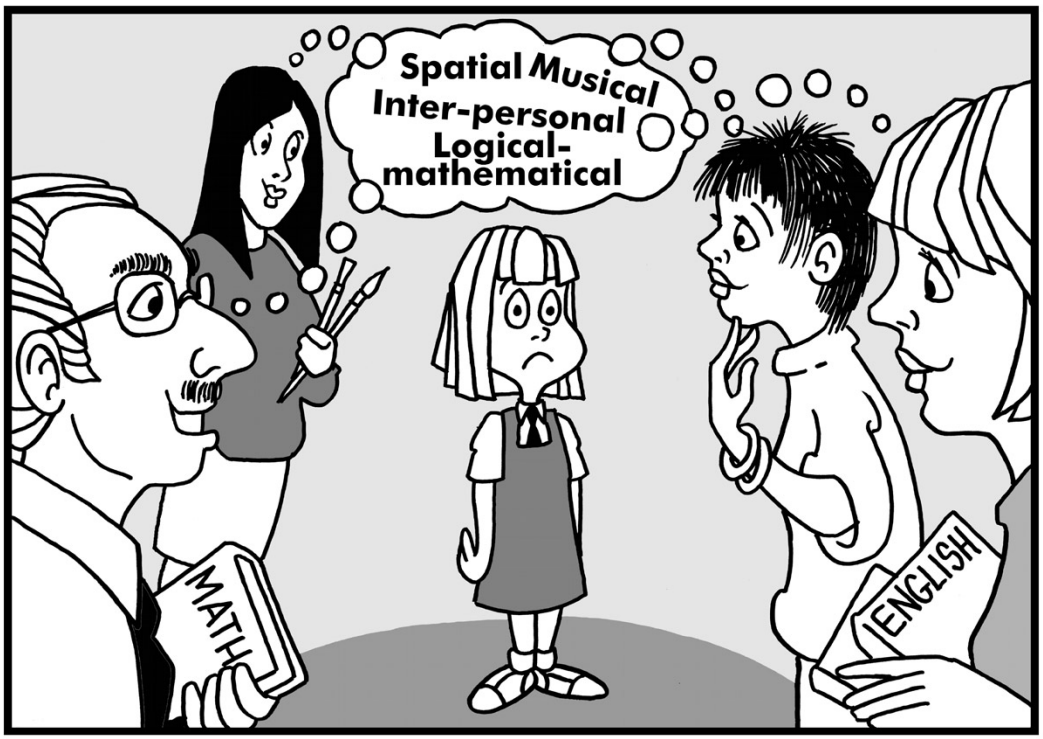
- Don't attempt to teach all concepts or subjects using all of the intelligences. 'Applying a scattershot approach to each topic is a waste of time and effort.'
- Don't believe that going through certain motions activates or exercises specific intelligences.
- Don't use intelligences primarily as memory devices. 'It may be easier to remember a list if one sings or dances to it. However these uses of the "materials" of an intelligence are essentially trivial.'
- Don't conflate intelligences with other desired outcomes. 'Interpersonal intelligence, the understanding of other people, is often distorted as a program for cooperative learning or as a playground for extraverts. Intrapersonal intelligence, the understanding of oneself, is often misused as a rationale for self-esteem programs or is attributed to introverts. These distortions and misapplications suggest a shallow (or nonexistent) understanding of my writings on intelligence.'
- Don't label people in terms of 'their' intelligence. 'People so labelled may then be seen as capable of working or learning only in certain ways, a characteristic that is almost never true.'

(Direct quotations in the above section are taken from Gardner, 1999, pp. 89-91).

Keep your eyes open!

Like the fabled blind men with the elephant, each of us tends to see the qualities in students which are closest to hand. Too often, we are blind to the richness of the whole child. There is the risk that, if we accept MI theory unquestioningly, without heeding Gardner's own warnings, we may adopt rather uni-dimensional perceptions of our students.

If you see one talent in a student, look for others!



Splitting infinities

Beware seductive theories.

Try not to be beguiled.

Our kids are individuals

no matter how they're styled.

A teacher's not infallible

and kids can get misfiled

if each sees what he values

and no one sees the child.

– *Miraca Gross*

The Principal's role in implementing a 'multiple intelligences' curriculum

If your school is working on a 'multiple intelligences' curriculum there are some issues that you may need to consider.

The first issue raised by Gardner in his list of things to avoid is extremely important. Trying to force-fit all 7 (or 8, 9 or 10) 'intelligences' to a topic in a curriculum unit is, as Gardner points out, a waste of time. Furthermore, this can destroy the integrity and rigour of some subjects. Attempting to develop 'bodily-kinaesthetic intelligence' in maths by getting children to form numbers with their bodies is not maths. Trying to foster 'linguistic intelligence' by creating science-related words out of the chemical table of elements is not chemistry.

Creating original and 'fun' activities for all is not the same as differentiating the curriculum for gifted students. MI curricula should be submitted to Passow's three 'key questions' just as stringently as we would submit any other curricula we intend to present to our gifted students.

Would all students want to be involved in these learning experiences?

Could all students participate in these learning experiences?

Should all students be expected to succeed in these learning experiences?

If the answer to any of these questions is **yes** the curriculum is **not** appropriately differentiated for your gifted students. It is not pitched at the level, pace and degree of abstraction that are needed by students who are gifted or talented in the subject area or areas in which the curriculum is set.

Unless MI curriculum is overlaid with challenging, higher-level tasks developed through the models of Bloom, Maker, Kaplan or Williams, it is unlikely that it will serve the needs of gifted students.

A number of schools are using Bloom/Gardner grids developed by commercial publishers. This can be a useful way of synthesising these two models. However, the ideas and activities presented still have to be submitted to Passow's 'trinity' of questions. The majority of commercial curriculum materials are developed to match the capabilities and needs of the majority of students — so these materials may not provide an optimal match with the needs of gifted students. You may want to use the ideas provided in commercially developed books or kits as 'foundation' ideas on to which your staff can build greater rigour and higher levels of abstraction.

Commercial materials may provide excellent 'horizontal enrichment' but may be much less suitable for **extension**. This will be discussed further in Specialisation Module 5.

Talent searches

'What is honoured in a country will be cultivated there.' (Plato)

National Talent Searches have existed for thousands of years. While the earliest talent searches were designed to secure the safety of a nation or empire, and assist in its administration or defence, modern talent searches are designed to identify young people who possess high levels of some aptitude or ability that their country or community values, and to assist them to develop these gifts into talents.

Chinese 'Public Service' talent searches

The oldest talent search that we know of was developed as early as the second century BC and was designed to identify highly able young people who could be trained to occupy positions of responsibility in the administrative bureaucracy that governed the vast Chinese empire. Several dialects of Chinese were spoken throughout the empire and people from different regions could not easily converse, so a strong emphasis was placed on literacy in the common **written** language which had been developed specifically for this purpose.

A three-tier selection process was set in place with applicants for positions in the Public Service passing through an increasingly rigorous series of tasks. By the 12th century AD, while linguistic mastery was still extremely important, administrators were also promoted on their knowledge of the geography of the empire, law, military affairs, agriculture and taxes, and their command of statescraft and administrative skills.

The Chinese emphasis on objective assessment under examination conditions which were designed to be scrupulously fair became an important element in the talent searches later developed by other nations and cultures. Examinations for entry to the introductory ranks of the Public Service were held in the chief city of each district and the questions and test conditions were designed to be identical. It is interesting to note how the principles of assessment developed in ancient China still influence modern testing procedures.

- While the Public Service Talent Search did not begin till the second century BC, China had used proficiency testing to determine hiring and promotion as early as 2200 BC.
- These tests assessed the specific skills which the applicant would require in the job for which he was being considered. For centuries before Confucius there were job-sample tests in music, archery, horsemanship, writing and arithmetic.
- Participants in the Public Service Talent Searches passed through a series of carefully graded, increasingly rigorous, tests.
- Testing sessions were systematically administered to ensure consistency.
- Examiners were specially trained in scoring techniques to ensure inter-rater reliability.
- Scrupulous attention was paid to anonymity in scoring.
- Tests were revised to suit changing times and changing needs.

While the Chinese empire greatly honoured its senior administrators, the Mandarins, they were regarded firstly as servants of the empire and the rigour and objectivity of the selection procedures were designed to ensure that the empire's administrators were chosen for their ability to provide outstanding service. This was highly unusual for its time: in many other cultures the top jobs went to family members of the monarch or emperor with little regard for their experience or ability!

The Ottoman empire talent search

From the 14th to the 16th century the huge Ottoman (Turkish) empire was governed by administrators selected deliberately from a talent pool of gifted and highly educated slaves who owed their lives, careers and good fortune to the Sultan and would be unlikely to rebel against him.

Each year, talent searchers were dispatched throughout the empire to seek young boys who showed high intellectual ability or physical prowess. These children were taken forcibly from their homes and were transported back to Constantinople. The children were assessed by an examining panel which asked them questions resembling those in modern IQ tests. The brightest of them were selected as student 'pages' and the very brightest were sent to the Palace School to be educated. The young people who had been selected on the basis of their physical prowess were trained as soldiers, with the strongest and most physically gifted being reserved for the elite corps of Janissaries.

The pages were not simply junior servants; they were empire administrators in training. The promotion system in the school was on merit, resembling that of the Turkish Government and also reminiscent of the Chinese Public service. The curriculum was broad, including oral and written fluency in Turkish, Arabic and Persian, these being the main languages of the empire. The young pages also studied law, philosophy, mathematics, science, theology and music. There was also constant physical exercise with special attention paid to horsemanship; the Sultans believed that a healthy mind functioned best in a healthy body. After a rigorous and carefully tailored education lasting approximately 14 years, many of the graduate pages were sent back to the country of their origin — still part of the vast empire — to govern their own former people on behalf of the Sultan.

The birth of modern talent searches

Modern talent searches have their origin in the vision of one remarkable man, Professor Julian Stanley of Johns Hopkins University in Baltimore, USA. In 1968 he encountered, by chance, a highly gifted 12-year-old boy with a remarkable gift for computing who was helping graduate students with Fortran. Stanley became aware that the boy also had an astonishing gift for mathematics, but age-appropriate tests were powerless to assess the full extent of his abilities (Colangelo, Assouline & Gross, 2004).

Stanley assessed the boy on the Scholastic Aptitude Tests (SAT) of maths and language used to assess 12th grade American students for college entrance — and despite being at least five years younger than the age-group the tests were designed for, he did exceptionally well. Stanley tried to intervene for the boy with several local high schools, to allow him to take accelerated programs in his talent areas, but all refused. The boy was socially and emotionally mature for his

age and the curriculum designed for his age-peers had little relevance for him; he had passed through most of the work years before. Eventually, with the support of Julian Stanley, he enrolled in undergraduate studies at Johns Hopkins where he graduated with both a BA and MA at age 17 — a striking example of successful radical acceleration.

Stanley became aware that there could be many such young people across the United States — perhaps not students who would be emotionally ready for college entrance but certainly students who could benefit from a more academically challenging curriculum in middle school and high school. In 1971 the Spencer Foundation gave him a generous financial grant to find and assist mathematically talented students who needed something more and different if they were to fulfil their potential. The modern Talent Search was born.

Today, many nations, including the USA, Canada, Australia, China, Singapore and Israel run academic talent searches. Talent searches offer a challenging test designed for older students to younger, bright, highly motivated students who already show unusual aptitude in a specific domain. Academic talent searches use aptitude tests rather than achievement tests; aptitude tests allow gifted students to use their reasoning abilities to solve problems even if the context is unfamiliar (Lupkowski-Shoplik, Benbow, Assouline & Brody, 2003).

Talent searches begin with a two-step process. The first stage is to identify students who have high ability in the field of the talent search and who would benefit from off-level assessment. This is usually based on their existing scores on an age-appropriate test — in general somewhere at or beyond the 95th percentile. The second stage is to assess these students on the off-level test which is generally designed for students three or more years older.

Typically, when students scoring in the top ranges of a test are assessed on an above-level test, a new 'bell curve' of scores appears with some of these gifted students scoring at the lower end of the new curve, some in the middle ranges, and some at the top end. **This does not mean that the students scoring below average on the above level test have 'failed' the test.** It is impossible to 'fail' a test of material one has not been taught. Indeed, a student's score on an off-level test should not be thought of as 'success' or 'failure' — **all** students sitting an off-level test have, by definition, already demonstrated high level aptitude on the age-appropriate test.

Scores on an off-level test can, however, assist teachers to discriminate between **different** levels of high ability. Jan, a gifted Year 5 student who scores at the 85th percentile on a test of maths designed for students in Year 8 has a higher level of maths aptitude than her classmate Steve who scores at the 30th percentile on that same off-level test — even though Steve is **still** gifted. Both Jan and Steve scored at the 95th percentile on the Year 5 test!

It would have been difficult for Jan and Steve's maths teacher to develop an appropriately differentiated maths curriculum for these two students on the basis of their on-level test scores — the on-level tests did not have sufficient discriminatory power. The off-level test, however, clearly shows that Jan's maths aptitude — and therefore her maths curriculum needs — are very different from Steve's.

Australian National Talent Search

Given Australia's passion for sport and athletics, and our justified admiration for, and desire to assist, young people talented in these areas, it is perhaps not surprising that our country's first talent search was, and still is, dedicated to identifying and fostering gifted young athletes and sportspersons. In 1994, as part of the lead-up to the 2000 Olympics, the Federal Government allocated $500,000 per year for two years to establish a talent identification program. The purpose of this program, which became known as Talent Search, was to identify athletic and sporting talent and to fast-track athletes for the Olympics. Eight sports — athletics, cycling, canoeing, swimming, rowing, triathlon, water polo and weightlifting — were chosen for inclusion and the target group for identification was gifted young people aged 14-16 years. This meant that the young athletes would be 20-22 years old in 2000. Talent Search coordinators were employed and based at each of the state academies or institutes of sport.

Talent Search had three phases:

> **School screening**. Equivalent to on-level testing in academic talent searches, this consisted of screening in the school environment using a battery of eight physical and psychological tests.
>
> **Sport-specific testing**. Students who scored in the top 2% on any of the eight tests were invited to participate in Phase 2 — off-level testing to assess for higher level talent in any one of the eight targeted sports. This phase equated, in some ways, to off-level testing in academic subjects.
>
> **Talented athlete program**. Students identified as having talent in a specific sport were invited to join a talented athlete program organised by a state or national organisation within their sport.

Funding and organisation arrangements have changed over the years and a much wider range of sports is now included but the program still follows the traditional talent search pattern of initial identification, off-level assessment and provision of appropriate training. Talent Search offers free talent identification to secondary schools and their students, and schools generally put forward, for this special assessment, students who are believed to have above-average potential. The age range is usually 11-18 although, as originally, most students tested are in the age 14-16 range. Those identified as having talent as a result of the special assessment are invited to develop their talent in either a quality sports program or a formal Talent Identification program.

> **Phase 1:** Tests are conducted by students' schools based on simple measures that would often be used to test student fitness. The students' results are then submitted to the local Talent Search Coordinator to be carefully scrutinised. Promising students are then invited to participate in Phase 2 testing.
>
> **Phase 2:** These tests may be somewhat similar to Phase 1 tests or they may be advanced sports-specific tests but they are conducted with more advanced scientific equipment, resulting in greater accuracy of results.
>
> **Phase 3:** Students whose tests have revealed favourable characteristics for a particular sport are invited to join a talented athlete program. Specialised coaching is provided to nurture the athlete and fast-track their development. The athlete is provided with an individualised program structured to the athlete's level of ability and level of development.

An important element in talent searches is that students are not exposed to off-level testing unless they have first **demonstrated** high aptitude on an on-level test.

Australia's sports and athletics Talent Search follows the classic talent search program; (1) identification through on-level testing; (2) confirmation and refinement of identification through off-level assessment; and (3) provision of advice on suitable avenues of talent development.

Where this talent search differs from most **academic** talent searches, however, lies in the fact that funding is also provided to directly **assist** the talented young person to develop his or her sporting or athletic talents, not only through individualised coaching and mentorship but also through ability grouping and acceleration — even through many Australian teachers still refuse to use the last two provisions with academically gifted students!

The website of the Australian Institute of Sport has a wealth of useful information on the Talent Identification program which provides outstanding opportunities for young Australians with special aptitude in sport and athletics to develop their gifts into talents.

Access http://www.ais.org.au/ and follow the links to Talent Search.

The Australian Primary Talent Search (APTS) and the Australian Secondary School Educational Talent Search (ASSETS)

APTS and ASSETS are not competitions. They are testing programs for academically gifted students, initiated by the Gifted Education Research, Resource and Information Centre (GERRIC) at the University of New South Wales, in association with the Belin-Blank International Center for Gifted Education and Talent Development at the University of Iowa.

APTS tests gifted students in Years 4-6. Since 1998 more than 12,000 academically gifted primary students in every state of Australia have participated in APTS. ASSETS tests gifted students in Years 7-9 (even in states where primary school continues into Year 7). ASSETS commenced in 2004. Over 2004 and 2005 almost 1,000 students from every state in Australia have participated in the program.

Like other talent searches, APTS and ASSETS employ off-level testing to assess the true levels of aptitude of students who have already been identified as having high ability. Identifying gifted students is critical; without appropriate academic challenge these young people may not fully develop their gifts into talents.

Professor Michael Pyryt has pointed out that a highly gifted Year 3 student who already knows and understands more, in maths, than the average Year 8 student, faces 50,000 minutes of potential boredom in Years 4-8 (50 minutes a day for 1,000 days) completing assignments on concepts he or she has already mastered! This student needs a significantly accelerated pace of instruction, opportunities to research topics in depth, opportunities to explore topics of interest and opportunities to interact with peers of similar ability. But this won't happen if this student's teacher is unaware of the full extent of his or her ability.

GERRIC sends, to parents of students who participate in APTS and ASSETS, two copies of the student's results on the off-level test. Parents are encouraged to give a copy to the student's school so that the child's teacher and school Principal can be aware of his or her scores on the subjects assessed by the test. Schools can then act on this important information.

Students who enter APTS take a test called EXPLORE. EXPLORE is a multiple-choice test developed by American College Testing (ACT) as a test for 8th grade students. The off-level test used in ASSETS is a special version of the ACT Assessment developed to assess Year 11 and 12 students in the United States for university entry. EXPLORE and the ACT Assessment measure academic aptitude in four subjects, English, maths, reading and science reasoning. The total time involved for APTS is approximately three hours, including testing and breaks. ASSETS takes half an hour longer.

Sample questions from EXPLORE and the ACT Assessment can be viewed on the GERRIC website (http://gerric.arts.unsw.edu.au). APTS and ASSETS testing is held once each year, generally in May, at a number of centres in each state and territory, including rural and remote centres. Testing is held on a Saturday morning but students whose religious faith precludes them from testing on a Saturday may be able to register for testing on the following Sunday at a smaller number of sites around Australia.

Who is recommended to participate in APTS and ASSETS?

Precise details of this can be found on the GERRIC website but broadly, APTS is open to students in Year 4-6 and ASSETS to any students in Years 7-9:

- who have scored in the 95th percentile on an individual or group IQ test (IQ 125+) or on an achievement test in any academic subject area,
- who have scored in the top band on any state's 'Basic Skills' test (LAP in Victoria),
- who have gained placement in certain types of gifted program (eg, Opportunity Class in NSW, PEAC program in WA),
- who have gained a Distinction or High Distinction in the Australian Schools Maths, Science or English Competitions,
- who have won an academic scholarship, or
- whose teachers believe them to be in the top 5% of academic ability for their age.

Please see the website for the precise entry criteria for which students must provide evidence.

How do students benefit from APTS or ASSETS?

- Taking EXPLORE or the ACT Assessment allows students to demonstrate unusual academic strengths in one or several key academic areas by taking an academically challenging test at a level that is not usually set at the Year levels in which they are enrolled. This information can be used by the student's school in planning appropriate curricular and programming modifications.
- Students gaining outstanding individual scores are acknowledged in a formal recognition ceremony at the University of New South Wales.
- Students scoring significantly above their Year level are eligible to participate in a range of GERRIC programs which have been developed specifically for high scoring APTS and ASSETS students.

How do families benefit from APTS or ASSETS?

- Families receive two copies of a comprehensive written report on the student's performance in the four subject areas. This includes recommendations for curriculum readiness. Families are encouraged to give the second copy to the student's school.
- Families are regularly informed of courses and programs for gifted students offered through GERRIC, including a range of student programs in school vacations, as well as courses and seminars regularly held for parents of gifted children.
- Families have the opportunity to participate in research to further assist gifted children.

The experience of participating in APTS or ASSETS offers many advantages to gifted students. For many, it is their first opportunity to test themselves against material that truly challenges them. The tests allow gifted students to stretch their mental muscles. It can be an affirming and indeed exhilarating experience. The experience also allows gifted students to develop better test-taking skills in a non-threatening atmosphere.

How do schools benefit from APTS or ASSETS?

These two nationwide talent searches provide objective identification of students talented in four key learning areas. Parents receive two copies of a comprehensive report which gives precise information on how the student compares with other Australian students taking the same test and also how he or she compares against the normative sample of students some years older. GERRIC encourages families to give the second copy to the student's school.

With the score reports comes a comprehensive analysis of the student's relative strengths and weaknesses across the four subject areas. Schools can use this to plan more closely individualised programs than would be possible without this sort of information. Increasingly, schools are using the practical information from APTS and ASSETS results to provide appropriate educational responses for their academically gifted students.

More than 50% of the gifted Year 4-6 students participating in APTS score above the average for Year 8 students! More than 50% of the gifted Year 7-9 students participating in ASSETS score above the average for Year 11-12 students! APTS and ASSETS reveal the wealth of talent — often hidden talent — in Australian schools.

Schools across Australia act as test sites for APTS and ASSETS. If your school would be interested in becoming a test site, or if you would like printed material about these Talent Searches which you could give to parents, email gerric@unsw.edu.au or fax (02) 9385 1973.

ct ROLE

Jenny is in Year 1 in Mr Allen's class. At the start of the school year her enthusiasm for maths was obvious and she rarely made an error. However, over the last few weeks she has started to make careless mistakes in maths and she doesn't want to complete the maths worksheets which she used to enjoy and love completing.

Mr Allen is beginning to wonder whether Jenny is bored with the level of maths he is giving her. He is aware of the Australian Primary Talent Search - indeed, his school has served as a test site for the last couple of years and Jenny's older brother in Year 5 did APTS last year - but Jenny is much too young. Mr Allen wonders what he could do to get a better idea of her true maths ability - and also what he can do to restore her love of maths.

p ROLE

es ROLE

Jenny is a Year 1 student in your school, in Mr Allen's class. He has come to you with a concern about a change which he has recently noticed in the girl. At the start of the school year her enthusiasm for maths was obvious and she rarely made an error. However, over the last few weeks she has started to make careless mistakes in maths and she doesn't want to complete the maths worksheets which she used to enjoy and love completing.

Mr Allen is beginning to wonder whether Jenny is bored with the level of maths he is giving her. He is aware of the Australian Primary Talent Search - indeed, your school has served as a test site for the last couple of years and Jenny's older brother in Year 5 did APTS last year - but he is aware that Jenny is much too young for APTS. Mr Allen wonders what he could do to get a better idea of her true maths ability - and also what he can do to restore her love of maths.

Mr Allen doesn't have to postpone testing till Jenny is old enough to participate in APTS! The principles of off-level testing can be implemented at any age. A useful starting point would be to give Jenny a standardised test of maths aptitude developed for students of her age. This will give Mr Allen objective evidence of where she stands in relation to her age-peers. If she scores in the top 10-15% this will indicate to him that there may be a ceiling effect for Jenny on this particular test and that off-level testing would be advisable.

Mr Allen could then assess Jenny's maths ability using a standardised test designed for Year 2 or Year 3 students. If he wanted to make a less formal assessment first, he could ask one of the Year 2 or Year 3 teachers to lend him a teacher-made test that they use with their own class.

One way or another, he now has a picture of how far beyond Year level Jenny's maths ability really is and he can make a more informed decision about how to modify the maths curriculum to meet her learning needs.

Gifted students tend to learn new work faster and more completely than their age-peers. Even when she is presented with higher level work, Jenny will need less repetition. If the maths worksheets Mr Allen gives Jenny contain too many examples of the same type of task for her needs — 10 addition tasks set at ascending levels of difficulty, for example — he could differentiate the requirements for her by asking her to do the five hardest examples first. If she gets these right, he wouldn't require her to do the easier examples.

p ROLE

es ROLE

You can point out to Mr Allen that he doesn't have to postpone testing till Jenny is old enough to participate in APTS! The principles of off-level testing can be implemented at any age. A useful starting point would be to give Jenny a standardised test of maths aptitude developed for students of her age. This will give Mr Allen objective evidence of where she stands in relation to her age-peers. If she scores in the top 10-15% this will indicate to him that there may be a ceiling effect for Jenny on this particular test and that off-level testing would be advisable.

Mr Allen could then assess Jenny's maths ability using a standardised test designed for Year 2 or Year 3 students. If he wanted to make a less formal assessment first, he could ask one of the Year 2 or Year 3 teachers to lend him a teacher-made test that they use with their own class.

You could facilitate your staff's use of off-level testing by encouraging them to keep copies of tests which they have developed for their class, and which they feel have worked well, so that teachers of younger classes could use these for off-level assessment. Your school should also have a 'library' of standardised tests that teachers can use. The Australian Council for Educational Research (ACER) is an excellent source for these tests.

One way or another, off-level testing will give Mr Allen a better picture of how far beyond Year level Jenny's maths ability really is and he can make a more informed decision about how to modify the maths curriculum to meet her learning needs.

Gifted students tend to learn new work faster and more completely than their age-peers. Even when she is presented with higher level work, Jenny will need less repetition. If the maths worksheets Mr Allen gives Jenny contain too many examples of the same type of task for her needs — 10 addition tasks set at ascending levels of difficulty, for example — he could differentiate the requirements for her by asking her to do the five hardest examples first. If she gets these right, he wouldn't require her to do the easier examples.

Off-level assessment and appropriate curriculum differentiation should go hand in hand to optimise learning for gifted students. Simply giving a student an off-level test but failing to act on the information it gives us, isn't going far enough.

Part 2

Longitudinal studies: Gifted students growing up

Longitudinal studies are one of the rarest but most valuable forms of research. They are thin on the ground probably because they are so very time-consuming for the researcher! But we have learned a great deal from some of the better known studies which have followed gifted young people from their early childhood into adulthood. In particular we can look at some of the long-term effects of various interventions such as acceleration.

One of the earliest longitudinal studies of gifted children is also famous as being the longest longitudinal study **ever** conducted!

The Terman study

Lewis Terman, a psychologist based at Stanford University in California, conducted a monumental study which began in the early 1920s with 1,528 gifted children of IQ 135 and above. On his death in 1956 his colleagues continued with the study and it has passed through several generations of researchers. Today, in 2005, the study is still ongoing. The subjects who are still alive are in their nineties. Five books which provided major reports on the study were published between 1925 and 1995 and it has been the subject of numerous articles.

To find his subjects Terman canvassed schools across California. Initial nomination was by teachers. Terman asked teachers to nominate, to the study, the children in their classes whom they thought were the most intellectually able — and also the youngest child in the class. Acceleration was used much more commonly in the first quarter of the 20th century than it is today; academically talented students who were also socially and emotionally mature were often allowed to grade advance, therefore the youngest child in a class could well be a gifted child who had accelerated. Children who were nominated to the study were given individual intelligence tests using the then current version of the Stanford-Binet Intelligence Scale.

Terman and his colleagues collected an enormous amount of information about the children. Parents completed a lengthy questionnaire about the home. Teachers completed a somewhat shorter questionnaire about the children's schoolwork. The children were given a medical examination and their height, weight and other physical characteristics were recorded. The children completed a questionnaire about their hobbies and personal interests and also a record of books they had read during the preceding two months. They also completed a questionnaire about their play interests and took a set of seven personality inventories which assessed emotional stability and aspects of social and emotional development. Importantly, similar data were collected on randomly selected children of similar ages so that Terman could compare the gifted sample with a control group of age-peers.

An unfortunate perception of gifted children, which was extremely strong in Terman's time and which lingers even today, is that intellectually gifted students are weedy, undersized weaklings. Terman's findings came as a profound shock to those who wanted to believe that nature compensates for giving some individuals superior intelligence by bestowing on them inferior bodies. The gifted children tended to be taller, stronger, more physically robust and less prone to childhood ailments or accidents than were the comparison group children. They also reached puberty earlier. Subsequent studies (eg, Hollingworth, 1942; Gross, 2004; Gottfried, Gottfried, Bathurst & Guerin, 1994) have shown similar findings.

One of the most persistent myths about the Terman study is that the children came from middle-class families. Certainly some did but many did not. However, they were bright young people whose families tended to value education. Because of this, a greater proportion of the Terman subjects went on to tertiary study than was common for their generation. They entered occupations that paid well and, through upward mobility, they **became** middle class and their children were brought up in a middle class lifestyle. It is important to note this because some of the early critics of Terman's study attributed the physical superiority and better health of the Terman subjects to social advantage. However, Florence Goodenough, one of Terman's research assistants, believed that it was due to a generally higher standard of diet and medical care in their homes. Additionally, as Australian researcher Louise Porter has recently pointed out (Porter, 2005), gifted children tend to have fewer childhood accidents because they tend to think more about what they are doing!

Terman's group and education

Almost half of Terman's subjects could read before school entry and on standardised tests of academic achievement they consistently scored, on average, 40% ahead of their age-peers as they progressed through school. Twenty per cent were permitted to skip all or part of first grade and by the time they graduated from high school 10% had skipped two grades and a further 23% had skipped one (Terman & Oden, 1947). In high school, despite so many of them being younger than their classmates, they consistently scored in the top 10% of their classes in achievement. They enjoyed school — many of them, in middle age, spoke reminiscently about the support and encouragement they had received both from their families and from their teachers — and many more went on to college than was customary at that time. Indeed, around 65% of the men and almost 60% of the women went on to take further degrees. Laycock (1979) points out how remarkable this is because most were undertaking tertiary studies during the economic depression of the 1930s when the proportion of women graduating from college was very much smaller.

While Terman was proud of the academic achievements of his subjects, and happy for them, he was concerned that so many of these academically brilliant young people (more than 10% of the men and more than 15% of the women) did not attend college and 30% of those who did, did not graduate. However, again we must remember that the 1930s was a difficult time, financially, for many people. Terman noted that parental inability to fund college attendance was a significant hindrance for substantial numbers of those who did not attend or graduate.

An interesting finding of the study is that students who had accelerated in primary or secondary school were more likely to enter postgraduate study than equally gifted students who had not, and they were also more likely to complete postgraduate study successfully. A survey undertaken in 1977, when the average age of the group was 67, asked them to look back on their

lives and rate the satisfaction they had found in various areas. The responses of people who had been accelerated were generally more positive than those of people who had not. Accelerands reported significantly greater satisfaction in their work, in recreational activities, and, interestingly, in social activities and friendships, than did non-accelerands (Cronbach, 1996).

Terman and his colleagues concluded that, in general, academically gifted students of IQ 140 or above 'should be promoted sufficiently to permit college entrance by the age of 17 at latest and that a majority in this group would be better off to enter at 16' (Terman & Oden, 1959, p. 72). Certainly, as we will discuss later, for exceptionally gifted children this seems to be pretty sound advice.

Terman's group and careers

As with education, the careers of the Terman group reflect the era in which the study was set. By the time of the 1957 survey more than half the women were housewives with no steady outside employment. Of those who did have jobs, the largest group was in teaching and the next largest in business, as secretarial or administrative assistants. The women who did have professional careers tended to do extremely well; there were women with distinguished careers in science, art, education, writing and business. In 1954 Terman recorded the accomplishments of his group, showing that by age 40 they had written 67 books, more than 1,400 articles in professional or research journals and more than 400 short stories or plays. He pointed out that this was 10 to 30 times as large as could be expected for 800 randomly chosen people of the same age (Terman, 1954).

In the middle and later years of the study, Terman's research team compared men who were rated as 'most successful' and 'least successful' in their careers. One of the strongest findings was that the 'most successful' group had, as children, parents who themselves had significantly higher education than was was usual for the time, and who passed on a strong valuing of education to their children, while the families of the 'least successful' group had much less encouragement and valued education less. Another strong but unsurprising difference is that the 'most successful' had a much stronger drive to achieve than did the least successful group. There is no evidence, however, that these groups were distinguishable, in childhood, in terms of motivation.

Interests of the Terman group

In childhood, the Terman group showed many of the characteristics of gifted children which we have already discussed in previous Modules. Reading was consistently a favourite occupation in childhood: Terman's assessment of the children's reading abilities and interests showed that, at age 7, the average child in the group read more books than the average 15 year old! In addition, the books they read were more like those enjoyed by older children or adolescents. This love of reading continued into the adult years.

The games Terman's subjects loved as children tended to be more like those enjoyed by children several years older. A characteristic which Terman's team noted which has also been noted in later studies (eg, Hollingworth, 1942; Gross, 2004) was a propensity to want to change the rules of games to make them more interesting or challenging. This can be misinterpreted and resented by other children who assume that the gifted child is cheating!

The most recent report of the study has re-emphasised the degree to which the higher intellectual ability of the Terman children influenced so many aspects of their development as young people:

> *'Throughout the school years and into adolescence these children's interests, attitudes and knowledge developed in correspondence with their mental age rather than with their chronological age. Their academic achievement as measured by tests, their interest and liking for various future occupational careers, their knowledge about and interest in games, their choice of recreational reading materials, and their moral judgments about hypothetical conduct were all characteristic of older non-gifted children whose mental age-range was approximated by this much younger and brighter group. Even the intellectual level of their collections was more mature than that of their chronological age-mates' (Holahan & Sears, 1995, p. 16).*

We noted, in Extension Module 3, the propensity of parents of gifted students to become involved with community organisations — often charities which support children with special needs or families in difficulties — to which they give voluntary service, often over many years and often as unpaid administrators. Terman reported this in the earliest volumes of his study, as being a characteristics of the parents of his gifted group, and his research team described how, as the gifted group grew up, many of them continued this 'tradition' of service. 'Their roles as volunteers often included responsibility and influence comparable to those of many paid occupations' (Holahan & Sears, 1995, p. 97).

Contributions of the Terman study

The Terman study demolished many myths about gifted and talented students which had affected community attitudes towards these young people. In the first quarter of the 20th century, and for many years before, people had associated high intellectual ability in children with physical and even emotional weakness — the skinny, bespectacled 'nerd' who shuns exercise and outdoor activities and who is prone to accidents and childhood ailments. There was even a belief in 'early ripen, early rot' — the idea that academic brilliance in childhood would lead to 'burn-out' in adolescence. Terman showed that the physical and emotional health of gifted children tended to be superior to that of age-peers and that, with family and school support, high abilities were translated into high achievements and lifetime productivity. The study also demonstrated that acceleration caused no social or academic difficulties; indeed, by contrast, gifted students who were accelerated experienced greater school and college success, and reported greater satisfaction with many aspects of their lives, even in middle age and after, than did equally gifted students who were not permitted to accelerate.

The Study of Mathematically Precocious Youth (SMPY)

The best known, and most extensive longitudinal study of modern times is the Study of Mathematically Precocious Youth which was initiated by Professor Julian Stanley as an important element of his Talent Search which we reported earlier in this Module.

In Australia we tend to use the term 'precocious' in a derogatory sense to describe a child who behaves in an ostentatious manner — a show-off or 'smartypants'. What the term really denotes, however, is unusually early development. SMPY is a study of students who are unusually gifted in maths and are capable of performing at levels well beyond what would be expected for their age.

Stanley and his associates, principally Professors Camilla Benbow and David Lubinski of Vanderbilt University, are in the fourth decade of a planned 50-year study of 5,000 mathematically or verbally gifted adults who scored, as adolescents, on the Maths or Verbal scales of the Scholastic Aptitude Tests, at a level that would place them in the top 1% of the population.

The study has some interesting findings.

- Mathematically and verbally gifted children use problem solving strategies that do not seem to develop in children of average ability until some years later. It is not only that they are talented in maths or language; it is that they seem to engage with, and manipulate, maths or language in ways that are more characteristic of students several years older.
- They tend to possess an internal locus of control, accepting that they themselves are largely responsible for their academic successes or difficulties. They are less likely than their age-peers to attribute difficulties to external factors ('My teacher can't explain new concepts like Mr Jackson did last year; that's why I'm not doing so well at the moment') and, while in general they don't become conceited about their abilities, they are more likely to accept that they have unusual maths or verbal talents.
- Gifted students tend to be underserved both in primary and secondary school. Underachievement is imposed on many of them by an undemanding curriculum developed for students of average academic ability but quite unsuited in content, level and pace for students with specific maths or verbal talent.
- They tend to be well adjusted and have positive attitudes towards school. However, highly gifted students tend to experience more social difficulties at school, particularly in the case of verbally gifted girls who are often mocked for their mature and articulate speech. Mary Ann Swiatek found that verbally gifted students were more likely to conceal, or partly conceal, their abilities for peer acceptance than are mathematically gifted students (Swiatek, 1995). Gross (2004) suggested that this may be because a student with remarkable maths ability may feel the need to 'dumb down' mainly in maths classes, whereas a student whose vocabulary and modes of speech set her apart from age-peers may feel the need to be 'on guard' much more of the time.

- Talent Search participants tend to retain, and use, their high abilities. An investigation of one cohort of Talent Search participants when they were in their early 30s found that 90% of them had Bachelor's degrees while fully 25% held doctoral degrees (as against 1% of the American population having doctorates) (Benbow, Lubinski, Shea, & Eftekhari-Sanjani, 2000). Men and women in the study had equal educational attainments. As with the Terman study, the picture for these young people in adulthood is very far from the stereotyped 'early ripen, early rot' predictions.
- The highest achievers in the Talent Searches tend to maintain their superiority in adult life. In the late 1990s Lubinski, Webb, Morelock and Benbow (2001) surveyed Talent Search students from the early 1980s who had scored, on the SAT, at levels achieved by fewer than 1 in 10,000 in the population. More than 50% of these young people were already pursuing doctorates. Even though they were only in their 20s, many had published several articles or secured patents for their inventions. A sizeable number had already won prestigious awards in their fields.
- However, Talent Searches have also identified that achievement and success are by no means built in for gifted students. Where schools have not provided structured opportunities for talent development, these students perform, in school, and in later life, at levels significantly below their true capacity. As the Gagné model illustrated in Core Module 1, a facilitative school environment is required to promote the translation of high ability into high achievement. Gifts, no matter how profound, do not develop into talents unless the school accepts its responsibility to actively facilitate this process. Talent searches have noted significant differences, sometimes quite startling differences, in the adult achievements of equally gifted students whose schools have or have not provided special opportunities.

One intervention has proved effective beyond any other for Talent Search participants:

> 'Although the sheer number of studies on the short-term and long-term effects of the variety of accelerative experiences that are promoted by the various Talent Search programs is voluminous (Benbow & Stanley, 1996), the results can be summarised rather succinctly. When differences are found, they favor the accelerants over nonaccelerants irrespective of the mode of acceleration. And, Terman's data indicated this is true even 50 years after the acceleration occurred' (Cronbach, 1996).

The long-term effects of acceleration will be discussed briefly in the next section and in Specialisation Module 6. We also recommend that you access Professor David Lubinski's chapter in Volume 2 of *A nation deceived: How schools hold back America's brightest students*. This major gifted education report, published in September 2004, can be accessed and downloaded cost-free from its website: http://nationdeceived.org

An Australian longitudinal study

A study commenced in 1983 by Australian researcher Miraca Gross has followed the intellectual, academic, social and emotional development of 60 exceptionally and profoundly gifted young Australians who in childhood scored IQ 160 or above on the Stanford-Binet L-M when that version of the Stanford-Binet Intelligence Scale was still current (Gross, 1993). Children scoring at this level appear in the population at a ratio of 1:10,000 or fewer, and their academic and socio-affective development, and their educational and social needs, can differ radically from those of their age-peers. The majority of the young people are now in their mid-20s.

Influenced by the studies of Terman and Hollingworth, Gross collected a wealth of information about her subjects' academic development. At intervals during their primary and secondary school years, the children were given standardised tests of achievement in several academic subject areas. As in almost every case they 'ceilinged out' on age-appropriate tests, off-level testing was used to get a clearer understanding of the full extent of their abilities. Their tested levels of achievement were then compared with the levels of work they were permitted to undertake in class. This enabled Gross to judge the degree of 'fit' between the children's demonstrated achievement and the programs provided for them by their schools. In addition the children's school reports were examined to analyse their teachers' perceptions of their levels of ability and achievement.

In the 1980s and early 1990s Australian teachers were even less willing than they are now to employ standardised tests of aptitude and achievement. A lot of 'educated guessing' went on. The teacher of 7-year-old Jade wrote in her end-of-year report, that Jade's spelling was 'at grade level'; in fact, Jade's spelling age on the South Australian Spelling Test, which she was given as part of the study, was 9. Adam's Year 3 report stated that he 'could record addition and subtraction up to 20'; Adam had been performing at this level in his first year of school. Anastasia's Year 3 report read: 'She is to be commended in reaching the Year 2 and Year 3 objectives in mathematics'; Anastasia had actually scored at a 10-year-old level on a standardised test of maths.

This failure to use objective assessment led, in many cases, to teachers making serious underestimations of the children's abilities and, as a result, to some astonishing mismatches between student readiness and curriculum provision.

Hadley Bond, aged 22 months, was out for a walk with his mother — and he was beginning to get tired. His mother checked her watch and found that they had been out for longer than she had intended. 'My goodness, Hadley,' she said, 'guess how long we've been walking?' 'About 26 minutes, I think,' said Hadley — and he was right!

Hadley was the third son born to Holly and Robert Bond. Adrian and John were intelligent, quick-witted children; perceptive, intellectually curious and successful at school. However, the family quickly realised that Hadley's abilities went far beyond anything they could have imagined. He was a child of truly phenomenal mathematical ability. By 18 months he was already fascinated by the maths programs that John and Adrian had used on the family's home computer. He delighted in simple addition problems. He would squat on the floor working out the answer to a question with plastic beads and then joyously key it into the computer, laughing with delight when the response was verified. He taught himself to read before age 1 1/2 and by his second birthday he had his own library of small books, which he read with great enjoyment.

By the time Hadley turned five he had taught himself to add, subtract, multiply and divide. He had the reading and comprehension skills of an 8-year-old and avidly read everything he could get his hands on. He passionately wanted to go to school where, he believed, his learning would progress even more speedily and he would have access to all the wonderful books in the school library that his older brothers had described to him.

Hadley missed the cut-off date for school entry by a mere two weeks; however, in acknowledgement of his remarkable abilities, the state Education Department decided to allow him 'visiting rights' in the entry class of a neighbourhood school. For legal reasons, Holly was required to accompany him as, being underage, he could not be formally enrolled.

Holly was appalled by the simplistic, undemanding curriculum presented to Hadley. Despite the school having allowed him 'early entry', his teacher was unwilling to believe that he was as bright as his parents said he was. She wasn't, however, willing to check this out by giving him any form of maths or reading test. Instead, he was required to sit, listening quietly, while she introduced the numbers 1-10 to the other children. Similarly, he was taken, with the other 5-year-olds, through introductory exercises in reading readiness. His teacher would not permit him to do anything that could not be undertaken by his classmates.

Hadley's IQ was 178. At age 5, he had a mental age of almost 10. He was bright enough to know that there was something far wrong with the way he was being treated. He was bored, frustrated and resentful. Before the end of the first week he was protesting quietly but firmly to his parents that he was learning nothing at school and did not want to return. He had learned more, and been given more intellectual freedom, in pre-school. Concerned that such a negative experience might leave their son with a lasting dislike for school, Holly and Robert reluctantly decided to concede to Hadley's wishes. Hadley became Australia's youngest dropout, after a school experience of barely two weeks.

Hadley's story, from childhood to adulthood, is told in Miraca Gross's book ***Exceptionally gifted children*** *(Gross, 2004). Like most subjects in longitudinal studies, 'Hadley' has chosen a pseudonym to protect his identity.*

The children and adolescents described in the case studies above are truly remarkable young people. Students like this appear rarely in our schools. By including their stories in this Module we are not suggesting that the majority of gifted students would be, or should be, capable of working at the levels which they have achieved. Rather, we are including these case studies to illustrate something we briefly alluded to in earlier Modules; that students at different levels of giftedness — mild, moderate, high, exceptional and profound — have different levels of academic ability and that we should not underestimate individual gifted students' capacity to learn.

If students like these can pass through years of schooling without their remarkable abilities being identified, how much more often may we be failing to identify and respond to more moderately gifted children?

Parents have known their children, and followed their development, for years before they enter the school system. Teachers should listen thoughtfully to what parents tell us about their children's early years. Rather than assuming that parents are biased or exaggerating when they describe unusual abilities in their children, we should use this informal 'parent nomination' and balance it with other forms of identification including, where possible, objective assessment on standardised tests of ability or achievement.

When her subjects were children and adolescents, Gross made regular surveys of the hours each child spent daily in voluntary reading, the title, author and subject classification of all materials read, the books which the children classed as current favourites, and their reasons for preferring these particular books. As with earlier studies of highly gifted children, Gross's surveys found that their reading interests were often very different from those of their age-peers and resembled those of older students. Indeed, they often read, with full comprehension and enjoyment, literature written for young people 5-7 years older.

This proved problematic, because, in general, by the time the children were in Years 3 or 4, their primary school libraries held no books which stimulated their interest. Indeed, some primary school libraries operated a kind of chronological apartheid with separate sections for junior, middle and senior primary students. This was extremely frustrating as most of these gifted children had already read the majority of books in 'their' section by the time they became old enough to access it! Similarly, many secondary school libraries had sections which only Year 11 and 12 students were permitted to access.

Inequity in 'equity'

Most of the young Australians in Gross's study undertook their primary education during the 1980s — in the era we described earlier in this Module as one of militant egalitarianism. In many schools 'equity' was confused with 'sameness' and suggestions that individual students should be 'singled out' for special treatment were frowned upon. Fortunately, children with intellectual or physical difficulties were exempted from this 'one size fits all' philosophy, as were children talented in sport and music, but the majority of academically gifted students were trapped by it. With a few notable exceptions such as the Selective High Schools and Opportunity Classes in New South Wales, the University High School acceleration program in Melbourne and a range of programs in Western Australia, schools kept gifted students with age-peers, and in mixed-ability classes, and, in general, few teachers knew enough about the needs of gifted students to even consider differentiating the curriculum for them.

The 60 young Australians in Gross's study are some of the most intellectually gifted young people ever discovered. There is little doubt that all of them would have benefited from academic acceleration; instead, the majority were retained with age-peers for their entire schooling or permitted a single grade advancement. In several cases schools justified the decision not to accelerate these students on the grounds that it would be unfair to offer an 'advantage' to one child that could not be offered to all. The mother of one of the most highly gifted of Gross's subjects was informed that it would be a violation of the principles of social justice if her son was given any work which could not be mastered by the majority of students in his class.

We will discuss, in Specialisation Module 6, some of the research on 'radical acceleration'. This is usually defined as any combination of accelerative procedures which results in a student graduating from high school three or more years earlier than is customary. It is very rare indeed for radical acceleration to comprise a single, three-year, gradeskip. Usually the grade advancements are separated by periods of consolidation. Obviously, radical acceleration is rarely practised, firstly because it is suitable only for extremely gifted students who are very mature socially and emotionally and who are eager to move much more speedily through school, and secondly because most schools will not even consider it as an option.

When the 60 young adults are grouped in terms of the degree of acceleration permitted, some interesting patterns appear:

A Young people who have been radically accelerated

B Who accelerated by two years

C Who accelerated by one year

D Who were retained with age-peers for the whole of their schooling.

Group A: Radical accelerands

Surprisingly, when one considered the sociopolitical beliefs of the era they were educated in, 17 of the 60 young people in Gross's study were allowed to radically accelerate through school. None regrets his or her acceleration in any way. Those who would, in retrospect, have changed things, say they would probably have preferred to accelerate still further, or have started earlier. The extremely gifted young Americans from the SMPY study who were surveyed in their 30s by David Lubinski expressed exactly the same views (Lubinski et al., 2001).

Some of the young people had a rough start to school but things improved for them later — Hadley Bond, who became Australia's youngest school dropout at age five, is one of these — while others were fortunate enough to enrol, right from the start, in schools where a teacher or school administrator recognised their remarkable abilities and argued for a strongly individualised program. All 17 are characterised by a passionate love of learning and almost all have gone on to take PhDs.

Despite being some years younger than their classmates, the majority topped their state in specific academic subjects, won prestigious academic prizes or represented their country or state in Maths, Physics or Chemistry Olympiads. Several won scholarships to attend prestigious universities in Australia or overseas.

In every case, the radical accelerands have been able to form warm, lasting and deep friendships. They attribute this to the fact that their schools placed them, relatively early in their schooling, with older students to whom they tended to gravitate in any case. Those who experienced social isolation earlier say that it disappeared after the first gradeskip. Two of the radical accelerands are married with children. The majority are in permanent or serious love relationships. Interestingly, they tended to choose partners who are also highly gifted.

Group B: Two-year accelerands

The six young people who accelerated by two years report as much, or almost as much, personal satisfaction with their education as do the radical accelerands — although most say they would have very much liked another grade-skip. None regrets accelerating. They are less likely to do PhD study than Group A, but the majority have taken Bachelors (Honours) degrees.

They are almost as likely as Group A to report satisfactory personal and love relationships. However, members of this group who were not permitted acceleration until later in their schooling (eg Ian Baker, part of whose school history was told in the Primary and Secondary case studies above) tend to find socialising difficult. Exceptionally and profoundly gifted students should have their first acceleration in the early years of school before they experience the social rejection which seems to be a significant risk for extremely gifted students who are retained in the mixed-ability classes. The skills of friendship building (rather than just playing together) are first learned in the early years of school and children who are rejected by their peers may miss out on these early and important lessons in forming relationships.

Group C: One-year accelerands

Four of the young people were permitted a single grade advancement. These young people are not deeply satisfied with their education. Their school experience has not been happy. They would have loved to accelerate by more than one year. After the euphoria of having new, challenging work, school became just as boring as it had been before the acceleration.

Why did these students' schools refuse to accelerate them further, when the first acceleration has been so successful? In general, the schools were afraid that, while one grade-skip had worked, further acceleration might lead to social or emotional damage in later years. In two cases the school was concerned for the self-esteem of other students because the accelerated student was performing so much better than they were!

The Group C students have tended to take undergraduate degrees and stop there. Because they have not had the experience of pitching themselves successfully, and over a period of time, at work which is truly challenging and demanding, they have no idea of the full extent of their capacities. They tend to have low self-expectations. Because of this they have tended to enrol in undemanding academic courses and they have consequently found university intellectually unchallenging. It is with this group that a serious dissatisfaction with friendships and love relationships starts to appear. Two have had quite severe problems with social relationships. Again, if children are not given structured opportunities in childhood to interact with developmental peers, they may not easily develop the skills of building friendships.

Group D: Students not permitted acceleration

The remaining 33 young people were retained in a lockstep curriculum with age-peers in 'inclusion' classrooms. The last thing they feel is 'included'. With few exceptions, they have very jaded views of their education. Two dropped out of high school and a number have dropped out of university. Several more have had ongoing difficulties at university — not because of lack of ability but because they find it difficult to commit to undergraduate study which is less than stimulating. These young people consoled themselves through the wilderness years of undemanding and repetitive school curriculum with the promise that university would be different — exciting, intellectually rigorous, vibrant — and when it was not, as the first year of university often is not — it seemed to be the last straw.

David, now aged 26, speaks for many of this group:

> *'All through my schooling teachers would say, "Yes, I know you know most of this but hang on, next year will be different." But the next year would be just the same, and the year after that, and the year after that again. Year 12 wasn't quite so bad because the curriculum was new in some respects and I had the carrot of university the following year dangling in front of me to keep me going. By this stage it really was all that* ***did*** *keep me going. And I was shattered to find that first year uni maths was Year 12 all over again. And the pace was* ***still*** *too slow. I started to get really depressed and I went to the uni counselling service and you know what they said? "Yeah, first year's pretty boring. It'll be better next year." What I wanted to say was, "So when am I going to start learning?"'*

Several of the non-accelerands have serious and ongoing relationship problems. These young people find it very difficult to sustain friendships because, having been, to a large extent, socially isolated at school, they have had much less practice, in their formative years, in the 'give and take' of social relationships. Roger says wryly: 'Socially, I have three feet; two left feet and the third one that I seem to put in my mouth every time I open it.' A number have had counselling. Two have been treated for severe depression.

The positive or negative influences of educational decisions extend far beyond the classroom. The great scholar John Feldhusen once said that rather than worrying about the consequences of accelerating gifted students, we should turn our attention to the consequences of not accelerating them.

Early predictors of high academic achievement

We strongly suggest that primary and secondary teachers, as well as early childhood teachers, should read this section. Its purpose is to discuss the strong predictive validity, for later school success, of early precocity in speech, movement and reading. We should listen carefully to, rather than dismiss, parents' claims that their children or adolescents were unusually advanced in the early years of school.

It's the first day of the school year and Mrs Morrison has the intake class at your local primary school. 'Twenty-three unknown quantities,' she says to Ms Carson, the Principal. 'Who knows what they'll turn out like.'

'Keep an eye on little Tara Maxwell,' says Ms Carson. 'I had her mum in on Friday telling me that she's reading already. Mum says she taught herself to read when she was 4.'

'I'd take that with a pinch of salt,' says Mrs Morrison. 'Probably she saw the big golden "M" and said "McDonalds".'

Researchers doing longitudinal studies often encounter the same scepticism. The retrospective nature of much of the case study research on giftedness in early childhood leads people who take a wholly or largely environmentalist view of giftedness to suggest that records of early speech, movement or reading arise from flawed parental memory or inaccurate recording. 'How can you **prove** that the kids in your study learned to speak before the usual age?' someone will say. 'You weren't around at the time — and you can't afford to simply believe what parents say!'

Modern day researchers have it easier than Terman had. We have audiotapes and videos to assist us. However, in recent years, the Fullerton Longitudinal Study of early and later childhood development has provided empirical evidence of the developmental advancement of intellectually gifted young children (Gottfried et al., 1994).

The Fullerton Longitudinal Study

The Fullerton Study traced the development of 107 children who were recruited through birth notifications of hospitals adjacent to the Fullerton campus of California State University. The children, who were one year old at the commencement of the study, were given numerous developmental assessments right through the first eight years of life. At age eight, seven years after the study commenced, they were assessed on the Wechsler Intelligence Scale for Children – Revised (WISC-R) and the 20 children who made a full-scale IQ score of 130 were designated the gifted group for the purposes of comparison with the other 87 children. The IQ range in the gifted group was 130-145 with a mean of 137.6, while the range in the comparison group was 84-128 with a mean of 110.9.

The Fullerton team therefore possesses objective, systematically collected data on the early development of a group of children who were identified as gifted several years **after** they entered the study. This is not, therefore, a retrospective study, but a developmental study conducted **in current time** and the consistent superiority of the gifted group cannot be attributed to flawed memory or parental bias.

The Fullerton Study found that differences in the level of intellectual performance between the gifted and nongifted children appeared as early as one year of age, and were sustained throughout the study. Interestingly, the earliest difference was found at age one, **on entrance to the study**, in receptive language. The Fullerton Study consistently noted significant differences in expressive language from infancy onwards. Assessments of comprehension, gross and fine motor skill, memory, and personal-social development consistently found the gifted group superior. Indeed, the only academic skill on which the gifted children did not display significant superiority was on numeracy — and the researchers noted that this was due to a ceiling effect on the test for the gifted group! Indeed, the Fullerton team concluded:

> *'Gifted IQ implies generalized high intelligence. Gifted children were superior across an array of cognitive tasks beginning as early as the pre-school period. Gifted children tended to be cognitively well rounded or adept. Globality rather than specificity in cognitive performance characterizes intellectual giftedness.' (Gottfried et al., 1994, p. 85).*

Although, as might be expected from the relatively small sample size, the Fullerton Study included no exceptionally or profoundly gifted children — the highest IQ in the group was 145 — its findings do lend credibility to retrospective assessments of unusual precocity in case studies of the intellectually gifted.

Developmental advancement in gifted children

If only we could take those teachers who genuinely believe that precocious intellectual and social development are merely a function of parenting and environment, and endow them, magically, with retrospective vision so that they could observe their highly gifted young students' often startling precocity from the first years, or months, of life! Even in early childhood many gifted children display significant and often quite striking differences from normal developmental patterns. The early development of speech, movement and reading are extremely powerful indicators of possible giftedness. Of course, not every child who speaks, walks or reads early is even moderately gifted (Jackson, 1992), but when these skills appear at unusually early ages, and particularly when they appear in tandem, they are generally linked to unusually advanced intellectual development.

Early development of speech

The average age at which children can be expected to utter their first 'meaningful' word (other than mamma-dadda 'babble') is around 12 months. By contrast, gifted children begin to speak, on average, some two months earlier. In addition, they pass through the stages of speech acquisition earlier and faster than children of average ability. By 18 months the average child has a vocabulary of 3 -50 words, but little attempt is made to link them into short phrases until the age of two; however, in gifted children, linking words into phrases can commence as early as 12 months. By age four there is a significant difference in the length of sentences spoken by average ability and gifted children, with gifted children producing sentences more than twice as long as their age-peers. (This body of research is discussed in full in Gross, 2004.)

The child in pre-school or kindergarten who 'talks like a book' and won't stop may well be a gifted child!

Studies of highly gifted children record instances of linguistic precocity far beyond even that of the moderately gifted. The average age at which Gross's exceptionally and profoundly gifted children spoke their first word was just under nine months! Eleven of these children spoke their first meaningful word by the age of six months.

The speech of some highly gifted children demonstrates quite remarkable fluency and complexity. Adam Murphy, one of Gross's subjects, uttered his first word at five months and by two months later was talking in three- and four-word sentences. His mother recalls the astonishment of supermarket assistants as Adam, aged seven months, gave a running commentary on the grocery items as she wheeled him past the shelves in the shopping trolley. Peter, whose first word, spoken at eight months, was 'pussycat', surprised his parents at 18 months by announcing, 'I think I'll have a quick shower.' Wendy Roedell and her colleagues reported a 2-year-old who regularly used such complex sentences as 'I'm trying to figure out where I left my dancing shoes' and 'I want to take a look at this story to see what kinds of boys and girls it has in it' (Roedell, Jackson & Robinson, 1980).

Occasionally the speech of highly gifted children may be delayed, as in the case of Jonathon and Christopher, two brothers in Gross's study who did not speak until 18 months and 21 months respectively and whose mother was warned by their pediatrician that this might be indicative of intellectual disability. (Jonathan later tested at IQ 170 and Christopher at IQ 200!) In these situations, however, when speech does appear, it often arrives in the form of phrases or short sentences, rather than words in isolation. Robinson (1987) reports a young boy whose first utterance, at 20 months, was 'Look! Squirrel eating birds' food!'

Early development of mobility

Just as gifted children generally demonstrate an unusually rapid progression through the stages of speech development, the development of mobility also tends to arrive early and to progress with unusual speed.

The age at which children walk when led or supported by an adult may be several months earlier than the age at which they are able to walk by themselves. The average age for walking while supported, in the general population, is reported as 11 months, and the average age of walking unassisted as 14-15 months (Vaivre-Douret & Burnod, 2001). Studies of the early movement of gifted children generally report that they pass through the stages of walking on average, 2-3 months earlier than their age-peers. Some remarkable examples of early movement have been reported in children who later tested as highly gifted. Linda Silverman (1989) describes a girl of seven months who stood alone, climbed into chairs unassisted and went up and down stairs by herself. Gross (2004) describes Rick, of IQ 162, who was sitting up by himself at four months, running at 11 months and riding a two-wheeled bicycle unaided at age three. The average age at which Gross's subjects of IQ 160+ sat up unsupported was 6.1 months, as opposed to 7-8 months in the general population and the average age at which they were walking independently was 12.1 months — fully three months earlier than is usual.

It is not surprising that the ages at which their children walked and talked tends to stay in the minds of parents of gifted children. Early mobility means an earlier age at which children can walk into trouble. Early speech means that the 'Why? Why? Why?' stage comes earlier too! Gifted children are not an unmixed blessing to their parents.

Early development of reading

Research on intellectual giftedness suggests that one of the most powerful indicators of giftedness is early reading. Terman (1926) reported that the children in his longitudinal studies started to read significantly earlier than children in the control group.

Studies undertaken in the last 30 years, when print has become much more easily accessible to young children through television and the other advertising media, show an even greater incidence of reading among gifted children in the early years. VanTassel-Baska (1983) reported on 270 13- and 14-year-olds who had achieved high scores in either maths or English in the Mid-West Talent Search. VanTassel-Baska found that fully 80% of this group was reading by age five and 55% were reading by age four. More than 90% of Gross's subjects of IQ 160+ were reading before their fifth birthday.

Research has found that children who demonstrate a precocious development of speech and movement are highly likely to develop reading skills substantially earlier than their age-peers. The research literature on the highly gifted contains a wealth of information on extremely gifted children who learned to read either with no assistance or with minimal assistance from their parents.

There are two notable outcomes of the remarkable precocity in speech, movement and reading among gifted children.

Firstly, their early mobility allows gifted children to move around independently and explore for themselves quite a bit earlier than their age-peers of average ability, while their very early speech enables them to express their ideas, seek information and interact verbally with their parents and family members at an age when many children are only beginning to experiment with oral communication. Both early movement and early speech contribute significantly to these children's capacity to acquire and process information, while their early reading gives them access to an information bank not usually accessible to children until several years after school entry.

Secondly, gifted children's difference from their age-peers may be identifiable from an early age, not only to their parents but to neighbours and other members of the community. It is difficult either to ignore or to conceal a pre-schooler such as Andrew, in Gross's study, who had developed a passion for number and would gleefully inform strangers waiting in line for a bus that they had, between them, 37 buttons on their clothes! Community attitudes towards Andrew's intellectual precocity varied significantly. Some people in the line would respond with amused chuckles, or engage him in conversation; others would frown or ostentatiously turn their backs on this small poppy who was growing too tall, too quickly.

Key points from studies of early development

Longitudinal studies such as the Fullerton Study and the studies of Terman, Gross and others have a number of common key findings.

- Parents are excellent judges of giftedness in their pre-schoolers. Contrary to common belief, they do not, in general, exaggerate their children's abilities and their memories of the children's early development are generally accurate.
- In the early years, children who are intellectually gifted tend to be advanced in all areas of development.
- Gifted children and age peers of average ability display different levels of ability in speech, movement and reading in the early years and these differences are strongly predictive of intellectual ability.
- The intellectual and academic superiority of gifted students lasts from infancy right through adolescence and into adult life. Gifted children's love of learning may be dimmed by schools which withhold appropriate educational provisions but the **capacity** to learn does not 'burn out'.

Characteristics of giftedness in areas other than academic

(Guest author: Professor Karen Rogers, Director of Research, GERRIC)

In Extension Module 1, we introduced Professor Karen Rogers' synthesis of the research on the learning characteristics of intellectually gifted students. This section explores the research on characteristics of students gifted in creativity, leadership, and the visual and performing arts.

Characteristics of giftedness in creativity

This form of giftedness is most often identified using a test of creative thinking, which will measure such skills as **fluency** (the generation of many answers in short order), **flexibility** (the generation of many perspectives or new directions in short order), **elaboration** (improvement of an idea through details, embellishments, and extension), and **originality** (production of an unique thought, idea or solution). In general, the score differentials between gifted and regular test takers have centred on fluency, ideational fluency, flexibility, elaboration, and/or originality, rather than on the total test battery composite score. For the 43 studies on differentiating characteristics of this form of giftedness, the distinguishing cognitive and learning characteristics include:

- **Scanning**: Defined as the capacity for 'taking in' the whole of a setting, situation, or task and then reducing it to a manageable part that can be changed or manipulated. Described first by Sternberg (1985) as 'selective encoding', it involves discrimination in taking in the relevant characteristics of the situation. For the creative poet this might mean looking across all the words and phrases he or she has jotted down until a new word or line seems 'right'. For the creative inventor, this might mean forming in his or her mind a rough or incomplete mental 'sketch' of a possible invention. This scanning is the first step toward the fashioning of a creative solution, product, or performance. Getzels and Csikszentmihalyi (1976) named this capacity 'problem finding' — that is, knowing a good problem when one sees it and having the vision that is needed to select the 'important' element or essence of a problem. This scanning ability is a qualitative difference between regular learners and creatively gifted learners, although some difference in degree is found when comparing creatively gifted and intellectually gifted learners.

- **Internal locus of control**: Defined as the attribution of one's success or failure to one's own ability (or lack of it) or to one's own effort (or lack of it). Since 1950 and the groundbreaking work of J.P. Guilford, researchers such as Amabile (1983) and Schaefer and Anastasi (1968), for example, have pointed out the tendencies of creative individuals to display strong self-acceptance and positive self-evaluation behaviour, which, in turn, lead them to look **within themselves** for the reasons why they have done well or not so well on a task or problem presented to them. With this internal locus, then, they pursue a problem and its solution with a single-mindedness and persistence despite difficulties. Most researchers in this area suggest that this attribution found in the creatively gifted is essentially a difference in degree rather than a difference in kind.

- **Flexibility in approach to learning and production**: First studied in adult scientists and later in creative children, this capacity has been defined by Hennessey and Amabile (1988) as the ability to find a creative solution or to go on working towards one, viewing the situation or setting with little or no acknowledgement of its constraints. Simonton (1995, p. 470) describes this flexibility in creatively gifted individuals as '… making their senses more open to the influx of fortuitous events in the outside world'. Torrance (1966) found that this ability to overcome or fail to 'see' difficulties on the way to solutions was strongly associated with a child's locus of control and self-esteem. What characterised the behaviour of these children was a willingness to change the so-called constraints, or change their own perspective of the situation as they worked toward an unusual solution on his Unusual Uses, Circles, and Draw a Person sub-tests, which ultimately formed parts of the Torrance Tests of Creative Thinking. Perhaps due to the means by which this characteristic is measured, this behaviour is probably more a difference in degree than in kind when comparisons are made with the regular population of learners in our schools.

- **Re-structuring of learning environment and learning**: According to Barron (1988), the restructuring of a situation, whether it be a creative child's desk — where it gets 're-placed' in his or her classroom as well as how it is internally 'organised' — or a task and its parameters, suggests that the creatively gifted individual incorporates six 'ingredients' in this restructuring: (1) recognising existing patterns; (2) making connections; (3) taking risks by making changes; (4) challenging 'obvious' assumptions; (5) taking advantage of chance; and (6) seeing in new ways. Although Barron first worked with MacKinnon in finding this true of creatively gifted adult scientists, architects, and writers, research since that time has found this behaviour to hold true in other creative occupations and with different developmental levels and ages. As with flexibility as a difference in behaviour among the creatively gifted, this difference seems to be a difference in degree rather than in kind.

- **Willingness to take cognitive, social and physical risks**: As this characteristic suggests, the creatively gifted child does not let the possibility of failure deter trying something new. Finke (1995, p. 273) has described this as 'manipulating the preinventive forms in playful ways', while Schooler, Fallshore, and Fiore (1995) term this 'playfulness'. One can watch a highly creative child undertake an art project, for example, quickly choosing materials and beginning to execute a design or product, only to start over with an entirely new set of materials and design ideas if or when the first process does not 'work out'. In observing such a behaviour, it is evident that the child does not worry about failure or making a mistake and has the confidence to try again should the outcome not meet his or her expectations. This trait in creatively gifted individuals seems to be a difference in degree rather than kind.

- **Tolerance for ambiguity**: Defined (Tetenbaum & Houtz, 1978; Urban, 1991, 1995) as a component of personality, this 'mind set' seems to allow the creative individual to pursue original solutions to a task under conditions that cannot predict outcomes of the person's effort. The creative child appears comfortable continuing to work on a problem or idea without actually being able to see whether he or she is on the 'right track' or 'making progress'. For the creatively gifted, this characteristic appears to be a difference in degree rather than in kind.

CASESTUDY

Jimmy is flamboyant in his dress; nothing ever matches, to his mother's great despair, but he is fun to be around. His excitement when he thinks of an idea is contagious, as is his sense of humour. He may or may not do well in school, depending upon his preschool teacher and how rigid she may be about activities and tasks. In activities where the teacher recognises and respects his fine, original mind, he outdoes himself in the quality and quantity of his work. But in tasks where 'things are to be done just so', where steps are carefully explained and products are meant to be reinforcements of learning, Jimmy refuses to produce or creates something considered 'entirely unacceptable'. This does not seem to disturb him nor keep him from trying again to do something unique when he does attend to the conditions of the problem he is given to work on. He thrives on taking a chance to do something 'new and different' and if his solution does not work, he will pick himself up and try again another day.

As a result, Jimmy's general skill levels are poor and there is some question about whether he is 'ready' for school learning. He has not acquired enough knowledge at this point to be able to fully use his high degree of originality. According to David Feldman (1980) and David Perkins (1981), he must become an 'expert' in some area for his originality to bear fruit. Without that, his creativity will probably never be fully utilised.

There is little doubt that Jimmy will be happy in adulthood; he has the natural flexibility to rearrange events for his own comfort. However, it will be a loss for society if Jim's creativity is not channelled into finding solutions and reformulating the problems that we have been grappling with for years, such as cures for cancer, prevention of ecological destruction, replenishing our ozone layer in the stratosphere, or providing food for the underdeveloped nations of the world.

Characteristics of leadership/psychosocial giftedness

This form of giftedness is most often identified by a student's performance on a task or project that has involved others or by engagement in an organisation or activity involving cooperative work with others. The identifier is most often a sport coach, a teacher, a school administrator or counsellor who has noted unusual attention to detail, successful completion of a complicated task or project, extraordinary personal interactions, and effective control. The recognition is comparative, that is, how this child has performed or conducted him/herself compared to others in the same context. In some cases, self-report assessments of leadership characteristics are used, but in most cases, no instrumentation is involved in the identification process. The distinguishing cognitive and learning characteristics, supported by 14 research studies include:

- **Task analysis/global scanning**: Task analysis has been defined by Sternberg (1985) as deconstructing a defined problem into a series of steps, beginning with the end goal and working backwards to the initial state. Studies of gifted leaders have clarified the leader's capacity to understand a given task and to be able to break it down into its parts, again, beginning with the ultimate outcome and planning the steps that would need to precede that outcome. Global scanning involves the capacity to apprehend the whole of a situation or context in a single effort rather than putting all the 'bits' of the context together to make the whole. Research have found gifted leaders significantly more likely to conduct this scanning before task analysis ensues.

- **Cognitive, affective, and visual perspective-taking/high social cognition**: These abilities can be defined as capacities to assume the view point of another medium, be it an expressed idea (cognitive), an expressed feeling or emotion, or an image viewed from an unusual perspective. Guilford (1981) was able to confirm affective perspective taking, which he labelled 'cognition of behavioural content', through factor analysis of his 'Structure of the Intellect' model of intelligence. In later work he confirmed social cognition, labelled 'divergent production of behavioural content', which basically means being able to cope with the behaviour of other people. Keating (1978) was able to analyse the relationship between the ability to resolve social dilemmas and verbalise social insights, measures of social cognition as well as cognitive perspective-taking. The inferring of another's visual experience has been observed in gifted children as young as three years (Walker & Gollin, 1977) and improves greatly as the children grow. Abroms and Gollin (1986) argued that these three forms of perspective-taking allow the gifted leader to 'stand in another's shoes'.

- **Advanced moral reasoning**: Numerous studies have attempted to study the relationship between intelligence and advanced stages of moral reasoning using Kohlberg's model. The general research has been contradictory; however, studies by Karnes and Brown (1981) and Tan-Willman and Guttridge (1981) linked advanced moral reasoning with children showing high levels of social sensitivity to the attitudes and values of others in their environment. Karnes and Schwedel (1981) studied leadership in pre-school children, discovering a precocious awareness of the needs of others, an ability to influence others, and an assumption of responsibility beyond what is expected for their age.

- **Lack of school-related anxieties (test taking, impending deadlines, teacher issues)**: As the set of behaviours suggests, the child who is a gifted leader has high self-efficacy and confidence that he or she can succeed (Bandura, 1973). Sternberg, Conway, Ketron and Bernstein (1981) included these behaviours as part of their conception of social competence: the individual thinks before speaking and doing, does not make snap judgements, assesses the relevance of information to a problem at hand, is on time for appointments, adapts well in social situations, is warm and caring, and is open to new experiences, ideas, and values.
- **Personal magnetism**: This compilation of personal characteristics generally attracts others to listen to or follow the gifted leader. Jarecky (1959), for example, measured such characteristics with the Vineland Social Maturity Scale, concluding that adolescents who received high ratings on sociograms, and 'good' characteristics ratings by their teachers on checklists, and who scored positively on the Vineland instrument, showed leadership characteristics such as: (1) being accepted for their leadership qualities by the majority of people who knew them; (2) being often involved in a social venture in which they made constructive contributions; (3) being considered arbitrators or policy makers by peers; (4) being able to make lasting relationships with peers and adults; (5) stimulating positive and productive behaviours in their peers; (6) using a personal approach to social complexities, using humour and insight.
- **Communication precision/expression**: This capacity is defined as the ability to modify one's form and content of speech according to what he or she presumes the listener will understand. It has been witnessed in studies of pre-school though adolescent gifted leaders by Maratsos (1973) and Menig-Peterson (1975), among others.

Janie has the uncommon knack of getting along with almost everyone. She seems to genuinely like everyone she meets and those feelings are almost instantly mutual. She is very perceptive in understanding other people's feelings and concerns; at times she has almost painful experiences when her empathy gets the best of her. Her parents tell of the time she cried and cried after seeing a documentary about the children starving in Ethiopia. She kept asking, 'Why can't I help them? What can I do?' She was five years old at the time.

In preschool, Janie gets along well with teachers because she is dependable. When her teachers want group projects done for a parents' visit, they know that putting her in charge of the project will result in a high quality, attractive project that every parent will perceive as a successful classroom experience. Janie, of course, puts in loads of extra time getting the project complete, time she seems to genuinely enjoy despite the fact that others in her group may not be doing their part. In the classroom, her ideas are looked up to by her classmates. She has the knack of relating almost any content brought up to the human situation, or at least to everyday relevance.

There are problems for Janie in school, however. It will be easy for her enthusiasm for new experiences to spread her too thinly. Often this may mean that her non-academic activities will take up more time than her school work. So far she has been able to get along on her finely attuned intuitive sense, but as her course work becomes more difficult, she is going to find that she has not acquired enough content or enough skills to let her get by on so little time for study and reflection. The Janies of the world keep classrooms running smoothly, but life down the road may not be so smooth for them if we don't help them more concretely with what schools are supposed to be about, while they are in our hands.

Characteristics of visual/performing arts talent

This form of extraordinary performance is most often identified by a child's specific performance in an arts area, such as drawing, painting, sculpture, dance, music performance, music composition, acting, creative writing, theatrical writing, graphic design, etc. For the 29 studies on differentiating characteristics of this form of giftedness, the definition of 'artistic talent' referred most often to students producing or performing in their art form anywhere from two to four years ahead of their current age. The distinguishing cognitive and learning characteristics include:

- **Broad, deep content/skill acquisition in a specific artistic area**: What the specific content and skills are in each arts area differs radically by art form. For music, this breadth and depth can encompass an understanding of the music the individual is either performing or composing. Both talents appear to be discrete and do not necessarily exist in the same individual (Barzun, 1965; Sessions, 1965). The skills one might identify for the talented musician include melody and pitch discrimination (Shuter, 1968), sensitivity to harmony (Shetler, 1985), musicality, or a sensitivity to musical meaning (Mursell, 1958). For the visual arts, the talent is most evident in an ability to draw well and early (Clark & Zimmerman, 1984) and aesthetic sensitivity, the knowledge of when a product or performance is done well, is finished, is balanced compositionally, etc (Winner, 1981). In dance, the skill appears to be an ability to discern, imitate, and remember kinesthetic patterns in detail (McKayle, 1966), and understanding of the semantic and emotional content of a dance (Duncan, 1927). In drama, the skills include the ability to discern and imitate speech patterns and gestural mannerisms (Gardner, 1973), comprehension of verbal material (Wolf, 1981), and the ability to remember and recreate emotions or emotional states (Stanislavski, 1948). Research suggests that these skills are differences in degree rather than kind.
- **Intense motivation to learn and concentration on learning in specific artistic area**: As this characteristic suggests, the artistically gifted child tends to almost seem obsessive in his or her pursuit of improved performance. There is a high level of perseverance from a very early age (Meier, 1966), and a willingness to spend long hours early on 'practising' or perfecting their art form (Bloom, 1985). There is often an emotional intensity (Pendarvis, Howley & Howley, 1996) that seems to keep gifted artists 'glued' to their art form. Much argument exists as to whether this characteristic or behaviour is a difference in kind or in degree.
- **Intense need to achieve (nAch) and to be recognised in the talent area**: Defined as a drive by Jung many decades ago, this need to feel competent, to feel in control of one's art form and to be recognised as 'good' in the art form has been described as a difference in degree when comparing gifted artists with regular non-artists. What it translates into is the willingness to persevere and practise the art form until self-recognised perfection is achieved. This recognition is often enhanced or shaped by the individual's arts teacher or tutor (Bloom, 1985), as the two set out 'benchmarks of progress' through exhibitions, performances, or competitions.

- **Self-monitoring of performance in all areas**: Again, most probably a difference in degree rather than kind, this cognitive ability can be defined as the capacity to judge one's own performance or current level of skill accurately and objectively (Sternberg, 1985). The acclaim or applause of others usually holds 'second fiddle' to their own assessment of performance or product (Rogers, 1986).

- **Memory**: Defined as the ability to recall or remember particular content, specific to a single arts domain — auditory for music and theatre, visual for arts, verbal and episodic for drama, and kinesthetic for dance. Hermelin and O'Connor (1980) suggested that musically gifted children are more accurate and quick at matching pairs of words, synonyms, and picture pairs than are intellectually gifted children, but both groups are significantly faster and more successful at these matching tasks than are regular learners. Rogers (1986) suggested that this perceptual, motor, and decision speed differential may be a result of artistically gifted individuals' extraordinary ability to 'decode' an alternative symbol system, whether that be reading music, learning movement patterns, executing art elements in two- or three-dimensional forms, or interpreting written words into body and voice expressions.

- **Preference for working independently or with a mentor in specific talent area**: This cognitive style preference, which includes the desire to be responsible for one's own learning, to be given unstructured learning tasks and assignments but within a structured learning environment, to work on projects and tasks individually, and to engage in independent study, has been researched consistently since the 1960s by administering learning styles inventories to large groups of gifted and regular learners and noting the strength of the differences in preference for independent learning (eg, Stewart, 1981; Dunn, Dunn & Price, 1981). Bloom (1985) also noted this difference in degree among gifted sculptors and pianists in his longitudinal study of talent development in the artistic, academic, and athletic domains.

Gene has always 'marched to a different drummer'. Life for this child has been filled with perfecting a wonderful ability for playing the violin, which he began at the age of three. He thinks nothing of spending several hours a day playing the exercises prescribed for him by his teacher but also just playing around 'for fun' on his own composed exercises. Those neighbours who know how much time Gene spends practising are vocal in calling this 'unhealthy' and 'not normal.' There is no question that Gene is probably very bright academically. He picked up sound and word recognition skills early and is already a fluent reader. Gene has an amazing eye for details and gets very excited when he has a chance to 'test' himself by playing in performances or for others.

Socially, Gene gets along fairly well. He has one or two close friends (who are usually involved in some kind of artistic endeavour), but beyond that does not seem overly concerned about acquiring a large group of acquaintances in his neighbourhood. His usual topic of conversation has something to do with music or some distantly related idea concerning music. Most of the neighbourhood and preschool children find this either boring or just don't understand why he finds that so interesting.

Psychologically, Gene is already a committed individual. To outsiders, he appears almost obsessive or compulsive about the talent area. He does not want to spend lots of time playing children's games or any kind of long activity that might interfere with the violin. He has made personal choices already about what is important to him, and academics are already on the losing end of that decision.

Schools are committed to educating every child, and teachers have assumed that every child wants to learn everything there is to learn. Little motivation for traditional academic learning is perceived as something wrong — either with the home or the child. It is difficult for the nurturing nature of a teacher to meet up with Gene, because this child has made unpopular decisions. We could argue that we should just let Gene be, but democratically we can't. Gene needs a thorough grounding in our culture. As E.D. Hirsch (1987) argued so persuasively in his book, ***Cultural literacy****, the schools must provide Gene with this literacy. As things now stand, he may not get this education.*

Questions for Reflection

- Which of the topics addressed in this Specialisation Module have you found most valuable? Why? In what ways has your thinking been changed or confirmed by what you have read?

- Can you think of a student in your present school or in a school where you have previously taught who, in retrospect, you think may have benefited from off-level testing? Is there a student in your present class who shares some similarities with that student?

- Longitudinal studies provide powerful evidence of the benefits of acceleration. To what extent does your school use acceleration with gifted and talented students? If your school has rarely or never accelerated a student what beliefs or attitudes among your colleagues may have led to this?

Resources

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GIFTED AND TALENTED EDUCATION

PROFESSIONAL DEVELOPMENT PACKAGE FOR TEACHERS

SPECIALISATION

Module 1

Primary

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Australian Government
Department of Education, Science and Training

THE UNIVERSITY OF NEW SOUTH WALES

GERRIC
Gifted Education Research, Resource and Information Centre

Module 1

Other Issues in Understanding Giftedness

Welcome to Specialisation Module 1: Other Issues in Understanding Giftedness. In this Module you'll be introduced to Howard Gardner's controversial 'Multiple Intelligences' model and some of the arguments for and against it.

We will look at the long history of Talent Searches and describe three current Australian Talent Searches which may be able to assist some of your present students to develop their gifts into talents. Longitudinal studies are extremely valuable as they give us an insight into how gifted young people develop as adults and the impact, in later life, of special assistance — or no special assistance — at school, and we will analyse the findings of several of these.

Some of the characteristics of giftedness in early childhood will be explored further in terms of their usefulness as predictors of later achievement.

Finally, we'll explore some of the research on the learning characteristics of students gifted in creativity, leadership and the performing arts.

Professor Miraca U.M. Gross

Specialisation Module 1: Primary

Other Issues in Understanding Giftedness

Contents

Outcomes

At the completion of this Specialisation Module you will be able to:

- assess the usefulness, for your classroom or school, of Gardner's 'Multiple Intelligences' model.
- evaluate the potential value, for students in your classroom or school, of participation in the Australian Sports Talent Search for students gifted in sport and athletics and the Australian Primary Talent Search (APTS) and Australian Secondary Schools Educational Talent Search (ASSETS) for academically gifted students.
- understand the effects in adulthood, as shown through longitudinal studies, of special school provisions for gifted children and adolescents.
- recognise some early childhood characteristics and behaviours which indicate probable intellectual giftedness.
- understand and respond to the learning styles and characteristics of students who are gifted in non-academic areas.

Part 1

Multiple intelligences — do they exist?

In Extension Module 1, we examined the origin and development of Joseph Renzulli's 'three-ring' model of giftedness. As discussed in that report, Renzulli built his model **not** on the characteristics of gifted children but on the characteristics and behaviours of successful 'creative/productive' adults, particularly the creative architects studied by MacKinnon in the 1950s and the astonishing collection of paradigm shifters in science, medicine, law, literature and other fields whose lives were studied by Sir Francis Galton in the 1860s — men such as Shakespeare, Michelangelo and Newton. Critics of Renzulli's model have pointed out that it is doubtful whether models of successful **adult** productivity — particularly extreme adult productivity — can be generalised to children and used to identify child potential.

Gardner's 'seven intelligences'

A similar problem exists with 'Multiple Intelligences'. In 1983, a neuropsychologist, Howard Gardner, published a book which came to arouse considerable interest — and considerable controversy — in the educational community. *Frames of mind: The theory of multiple intelligences* proposed that there exist 'seven separate and somewhat independent intelligences' rather than one central, generalised capacity to reason.

At first glance this is an attractive and encouraging theory. Surely, the more 'ways' of being intelligent we can identify, the more chance individual children have of being 'intelligent' in one way or another! Teachers want to think the best of their students and they want the best **for** their students. Parents, naturally, want the same for their children. And it is this very natural human wish that life should offer wider opportunities for young people to excel that has caused 'Multiple Intelligences' theory to be embraced with such enthusiasm — particularly in egalitarian Australia.

Nonetheless, there are many problems with 'Multiple Intelligences' theory. Firstly, like Renzulli's 'three-ring' model, it was not primarily derived from a study of children. Gardner derived his theory from a study of brain-damaged adults and his observations of the destruction or preservation of **separate** abilities depending on the area of the brain that had been damaged. For example, singing and speaking appeared to be separate functions of the brain which could be independently lost or spared. Similarly, language skills and spatial orientation appeared to be the function of different parts of the brain. The capacity to relate productively to other people seemed to be sited in yet another area.

During the same period in which Gardner was making these observations he was also working with children who were **not** brain damaged and he noted that, while some of these children seemed skilled in many areas, most seemed to demonstrate greater strengths in some areas than in others. An important maxim for researchers or developers of theory in education, psychology or indeed any other field is: 'Correlation is not causation.' We have to guard against assuming that two factors which seem to co-exist are necessarily causally linked. However, Gardner was influenced by what he perceived as links between the two groups he was studying:

> *'Both of the populations I was working with were clueing me into the same message: that the human mind is better thought of as a series of relatively separate faculties, with only loose and nonpredictable relations with one another, than as a single, all-purpose machine that performs steadily at a certain horsepower independent of content and context' (Gardner, 1999, p. 32).*

In *Frames of mind*, Gardner introduced his 'seven separate and somewhat independent' intelligences. The definitions provided below are taken from Gardner (1999) pp. 41-43.

Linguistic (verbal)
Gardner defines this as sensitivity to spoken and written language, the ability to learn languages and the capacity to use language to accomplish certain goals.

Logical-mathematical
The capacity to analyse problems logically, carry out mathematical operations and investigate issues scientifically.

Musical
This entails skill in the performance, composition and appreciation of musical patterns.

Bodily-kinesthetic
The potential of using one's whole body or parts of the body (eg the hand or the mouth) to solve problems or to fashion products.

Spatial
The potential to recognise and manipulate the patterns of wide space (those used, for instance, by navigators or pilots) as well as the patterns of more confined areas (such as those of importance to sculptors, surgeons, chess players, graphic artists, or architects).

Interpersonal
This denotes a person's capacity to understand the intentions, motivations and desires of other people and, consequently, to work effectively with them.

Intrapersonal
This involves the capacity to understand oneself, to have an effective working model of oneself — including one's own desires, fears and capacities — and to use such information effectively in regulating one's life.

Later Gardner added three additional 'intelligences'; naturalist, spiritual and existential. However, the majority of his writing has been on the original seven.

Gardner was frank and open in acknowledging that he had **no** scientific or empirical basis for his selection of what is, or is not, an 'intelligence': 'The selection (or rejection) of a candidate intelligence is more reminiscent of an artistic judgment than of a scientific assessment. Borrowing a concept from statistics one might think of the procedure as a kind of "subjective" factor analysis' (Gardner, 1993, p. 62).

Perhaps a better description of this procedure could be 'making an educated guess'! However, Gardner was by no means the first to develop a theory of loosely related 'intelligences'.

Thurstone's seven 'primary mental abilities'

Early in the 20th century, psychologist Charles Spearman proposed that there is a general, pervasive human ability, which he called *'g'* — general intelligence — which underpins virtually all human activity. This does not deny that *g* manifests itself differently in different fields of activity, or that different levels of *g* may be required for successful performance in different occupations; it does hold, however, that general intelligence — the capacity to reason — is at the core of all activities which involve the generation of knowledge and the processing of information (Carroll, 1993; Pyryt, 2000). It has usefully been described as 'a highly general information-processing capacity that facilitates reasoning, problem solving, decision making and other higher order thinking skills' (Gottfredson, 1997, p. 81).

In 1938 L.L. Thurstone challenged this widely accepted belief by proposing that there was no central, integrated capacity for reasoning but rather that intelligence comprised seven 'primary mental abilities'. Like Gardner four decades later, Thurstone emphasised that his seven abilities were independent of each other. Prominent among Thurstone's 'primary abilities' were mathematical aptitude, spatial ability, and verbal fluency and comprehension, which also appear in Gardner's 'seven intelligences'. Thurstone did not include 'personal intelligences' however, and he did not consider musical aptitude to be a 'separate' ability, perhaps because it is so closely linked to numerical reasoning and because, for the lyricist in song or operatic composition, it requires both musical and verbal facility.

However, Thurstone's theories came under stringent criticism from other psychologists and statisticians who re-analysed his data through the statistical procedure of factor analysis and reported that, when correctly analysed, correlations were found between several of Thurstone's abilities, suggesting an underlying general capacity to process and use information which permeated mathematical, verbal and spatial ability — Spearman's *g* had struck again!

Gardner's exemplars

As indicated earlier, Gardner's 'Multiple Intelligences' theory was derived originally from a study of adults who had suffered various forms of cerebral damage. For this reason, it's perhaps unsurprising that he uses adults as examples of the various 'intelligences'. What does seem a little strange, however, is that most of the examples he gives are highly gifted men and women; for example, Einstein for logical-mathematical intelligence, T.S. Eliot for linguistic and Stravinsky for musical. However, as Gardner later acknowledged (Gardner, 1999) many of the remarkable, creative-productive adults he proposed as examples of specific intelligences were actually

multi-talented and excelled in several domains. This seems to contradict the very theory he was proposing.

As with Renzulli, we must question whether Gardner's models of successful **adult** productivity — particularly extreme adult productivity — can be generalised to children and used to identify specific abilities in childhood.

'Multiple Intelligences' in Australia

> *'I believe that philosophically, morally, politically and educationally the approach must be that all children have gifts and talents which need to be identified, valued and fostered' (Colanero, 1985, p. 46)*

This quotation is taken from a paper which was originally presented in 1984, in Canberra, at the Australian National Workshop on Gifted and Talented Children from Populations with Special Needs. This conference had a laudable purpose — to highlight the point that gifted and talented children appear in every racial and ethnic group, among children with disabilities, in disadvantaged groups and in remote communities; to give the message, indeed, that wherever children are found we will find gifted children.

Unfortunately, this message was not widely accepted — largely because a view that was very prevalent in Australia during the 1980s was that every child had a gift or a talent. This concept was translated, in many schools, into the belief that since everyone was gifted there was no need to make special efforts to identify 'gifted' students, there was no need for special provisions for 'gifted' students (except where the gift lay in sports or music!) and there was no need for teachers to be trained in how to differentiate the curriculum for 'gifted' students since all were, by definition, gifted. Unfortunately, this confusion between the concept of gifts and and the concept of individual strengths, which we discussed in Core Module 1, was endorsed, and even fostered, in some state education systems. Several states which had provided modest funding for special programs for gifted students withdrew the funds and allowed the programs to lapse.

Gardner published *Frames of mind* in 1983 and over the next few years it was enthusiastically adopted in many Australian schools. Unfortunately in some cases the push towards its adoption was socio-politically motivated, rather than educationally driven or endorsed. Gardner's claim that abilities were separate and unrelated was politically 'highjacked' and re-interpreted as endorsing the view that all children have gifts and talents; all teachers had to do was find each child's 'intelligence'.

In 1988 Abraham Tannenbaum, speaking at a conference organised by the Gifted and Talented Children's Association of South Australia, humorously refuted Gardner's premise of separate 'intelligences':

> *'Unfortunately there are still some people who accept a pseudo-scientific belief that the human mind consists of many discrete abilities and that if you break down these independent abilities and keep on breaking them down, you will eventually reach a point where there are more special aptitudes than there are people walking on the face of the earth. And the logical conclusion and absurdity that arises from this belief is the idea that if there are more aptitudes around than people, then surely each human being must have a chance of possessing at least one superior aptitude. Sadly, however, this is not so. God was not a democrat when She distributed abilities' (Tannenbaum, 1988).*

Tannenbaum was affirming that human abilities are not discrete or only tenuously linked. For example, mathematical ability and musical ability are not two separate 'intelligences' as proposed by Gardner; they are aptitudes which teachers of maths and teachers of music happily acknowledge to be quite highly correlated. Similarly, what Gardner calls 'inter-personal intelligence' — the capacity to understand other people — is closely related to what he calls 'intra-personal intelligence' — the capacity to understand oneself — and indeed a strong relationship between the two is essential for mental health.

> Unfortunately, teachers who adhere too closely to the 'multiple intelligences' theory are reluctant to acknowledge that students who achieve highly in one area of academic work are likely to have the potential to achieve highly in other areas. **Rather than assuming that a specific academic ability exists in isolation, educators should look for unusually high potential in other subject areas.**

In his Adelaide presentation Abraham Tannenbaum noted that students attending elite schools for the musically gifted are generally seen to be academically able. He pointed out that students at New York's Juilliard School of Music are generally well above average in academic, as well as musical, studies. This is still so today. Musically gifted students are not permitted to enter the Cincinnati School for Creative and Performing Arts, which admits students at the age of 10, unless they show additional evidence of significant academic aptitude; they would require this to keep up with the standard of academic excellence set by the school's student body. Radford (1990) reported that the average IQ of students at the Yehudi Menuhin School of Music was 130. Fewer than three percent of people score at this level.

Ian, in Year 5, had a real talent for maths. He seemed to intuitively understand mathematical relationships. Mr Bryant, his teacher, was very impressed by him — maths was one of Mr Bryant's own strengths — and was determined to foster Ian's talent as much as he could.

Early in first term Mr Bryant had been to an inservice day where a consultant had spoken eloquently about Multiple Intelligences. The teachers enjoyed it very much. It was a theory that seemed to recognise the specialness of every child. As one of the inservice activities, the teachers were asked to analyse which intelligence characterised each of the children in their class and then think of activities that might foster each intelligence. Mr Bryant had no trouble identifying Ian's intelligence — it was obviously logical-mathematical — and for the next few weeks he did his best to foster Ian's passion for maths by developing activities in several different subject areas which allowed him to use his number skills.

After a few weeks Ian seemed to lose interest in maths. He didn't complete his work. He stared out of the window. He watched what the other kids were doing. He distracted the other kids by chatting to them. He kept a book on his lap and read surreptitiously. Mr Bryant tried to talk to him but Ian shrugged off his attempts to discuss what was happening.

Eventually Ian's mother, Mrs McKenzie, sought an interview with Mr Bryant and explained what was happening. 'He ***does*** *love maths,' she said, 'and he understands and appreciates that you want to help him. He likes you and respects you very much. But he says that everything you ask him to do these days is somehow related to maths and he needs more variety.'*

'But you know, he has very strong logical-mathematical intelligence,' Mr Bryant explained, and he outlined Multiple Intelligence theory.

'Well, that's an interesting idea,' said Mrs MacKenzie, 'but with Ian — don't get me wrong, I'm not saying he's a genius — but with Ian, there seem to be quite a few of these intelligences. He is very strong in language — although he tends to dumb down a bit at school because in Year 2 and 3 some of the boys teased him about his vocabulary — and he reads incessantly. And he plays the trumpet quite well for his age, his music teacher says.'

Over the next few weeks Mr Bryant looked more observantly at Ian. He found that once he stopped perceiving the boy only through the lens of MI theory, he was able to see a whole range of strengths and talents that Ian possessed — all those that his mother had mentioned, and more. And, ironically, once Mr Bryant reduced the focus on maths, Ian's love of maths returned!

Ian, a Year 5 student in your school, had a real talent for maths. He seemed to intuitively understand mathematical relationships. Mr Bryant, his teacher, was very impressed by him — maths was one of Mr Bryant's own strengths — and was determined to foster Ian's talent as much as he could.

The school's Professional Development Day early in the year had featured a consultant who spoke eloquently about Multiple Intelligences. The staff enjoyed it very much. It was a theory that seemed to recognise the specialness of every child. As one of the inservice activities, the teachers were asked to analyse which intelligence characterised each of the children in their class and then think of activities that might foster each intelligence. Mr Bryant decided that David's intelligence was logical-mathematical and for the next few weeks he did his best to foster Ian's passion for maths by developing activities in several subject areas which allowed him to use his number skills.

After a few weeks Ian seemed to lose interest in maths. He didn't complete his work. He stared out of the window. He watched what the other kids were doing. He distracted the other kids by chatting to them. He kept a book on his lap and read surreptitiously. Mr Bryant tried to talk to him but Ian shrugged off his attempts to discuss what was happening.

Mr Bryant took the problem to the Principal, Ms McLeod, for whom he had a lot of respect. 'Ian has an amazingly strong logical-mathematical intelligence,' he explained, and he outlined the huge range of logical-mathematical tasks and activities he had developed for Ian.

Ms McLeod had been Principal for quite a few years. She knew the kids and their families pretty well and she also knew her staff. She suggested that Mr Bryant might have over-reacted to the Multiple Intelligences seminar. It was just one way of looking at children — certainly not the only way. Indeed, it might be unwise to assume that the most visible talent in a child was his or her ***only*** *talent!*

'I agree that Ian has a lot of maths talent,' she said, 'but Jenny who had him in Year 2 found that he has quite a remarkable vocabulary too. There was a problem that year though, because he was bullied by some of the other boys and he went underground for a while — and now I think he's careful not to show his talent in English in case the bullying starts again. Maybe he's decided that talent in maths is more acceptable to the other lads. And his mum told me last year that he's learning trumpet outside school and has quite a talent for that, too. And he used to read incessantly. Has that stopped?'

Over the next few weeks Mr Bryant looked more observantly at Ian. He found that once he stopped perceiving the boy only through the lens of MI theory, he was able to see a whole range of strengths and talents that Ian possessed — all those that Ms McLeod had mentioned, and more. And, ironically, once Mr Bryant reduced the focus on maths, Ian's love of maths returned!

Howard Gardner in Australia

Gardner has been highly critical of educators who 'highjack' his philosophies for socio-political ends. 'Contrary to much that has been written, MI theory does not incorporate a position on tracking, gifted education, interdisciplinary curriculum, the schedule of the school day, the length of the school year, or other hot-button educational issues' (Gardner, 1999, p. 89).

Should schools attempt to identify and teach to students' individual 'intelligences'? Gardner's position seems to be ambivalent on this. He criticises other scholars who have attempted to devise tests to measure specific 'intelligences' on the grounds that such tests often confuse a child's interest in an intelligence with aptitude or skill in it. Indeed in 1999 he went even further, overtly criticising educators who attempt to identify and teach to the 'intelligences' he proposed 16 years earlier and even seeming to suggest that these 'intelligences' were hypothetical:

> *'I consider it a fool's errand to embrace the search for a "pure" intelligence, whether general intelligence, musical intelligence or interpersonal intelligence. I do not believe such alchemical cognitive essences actually exist; they are an outcome of our penchant for creating (and then attributing reality to) terminology rather than searching for determinable, measurable entities' (Gardner, 1999, p. 207).*

This seems to echo a comment from his first book, *Frames of mind* (Gardner, 1993, pp. 69-70):

> *'Sympathetic readers will be likely to think — and fall into the habit of saying — that here we behold the "linguistic intelligence", the "interpersonal intelligence" or the "spatial intelligence" at work, and that's that. But it's not. These intelligences are fictions — at most, useful fictions — for discussing processes and abilities that (like all of life) are continuous with each other. Nature brooks no sharp discontinuities of the sort proposed here. Our intelligences are being separately defined and described strictly in order to illuminate scientific issues and to tackle pressing practical problems. It is permissible to lapse into the sin of reifying so long as we remain aware that this is what we are doing. And so, as we turn our attention to the specific intelligences, I must repeat that they exist not as physically verifiable entities but only as potentially useful scientific constructs.'*

In his 1999 book Gardner specifically and scathingly criticised a group of Australian teachers who were attempting to teach 'multiple intelligences'. His main concern seemed to be that the teachers were employing not pure MI theory but 'a mishmash of practices with neither scientific foundation nor clinical warrant' (Gardner, 1999, p. 79). He complained that 'left-brain-and right-brain contrasts, sensory-based learning styles, neurolinguistic programming and MI approaches were commingled with dazzling promiscuity. Clearly, no one had separated out the curricular wheat from the extracurricular chaff' (p. 79). The curricular wheat, presumably, was MI theory.

Indeed, as this Module is being written, Gardner has again gone on record describing the use of multiple intelligences in Australian 'accelerative learning' programs as 'fatally flawed' (Slattery, 2005). **It is important to note that he is not referring to the practice of accelerating gifted students.**

Gardner criticises, with some justification, teachers who claim to be using 'multiple intelligences' but who are simply continuing practices they have used for years — but conveniently relabelling them:

> *'I once watched a series of videos about multiple intelligences in the schools. In one video after another I saw youngsters crawling across the floor with the superimposed legend "Bodily-Kinesthetic Intelligence". I said, "That is not bodily-kinesthetic intelligence; that is kids crawling across the floor. And I feel like crawling up the wall"' (Gardner, 1999, pp. 141-142).*

Practical advice from Gardner: Some 'don'ts'

Teachers who plan curriculum along the lines of 'multiple intelligences' may want to heed the following guidelines developed by Gardner. Perhaps we should particularly heed his warning that multiple intelligences are theory only and that this theory has not yet been scientifically validated. In particular, we should be aware that children who possess high ability in one domain of learning are **more likely than not** to possess high ability in at least some others. Within Gagné's framework, this could be expressed as: 'If a student shows **talent** in one subject, look out more closely for **hidden gifts** in other subjects!'

Gardner's guidelines

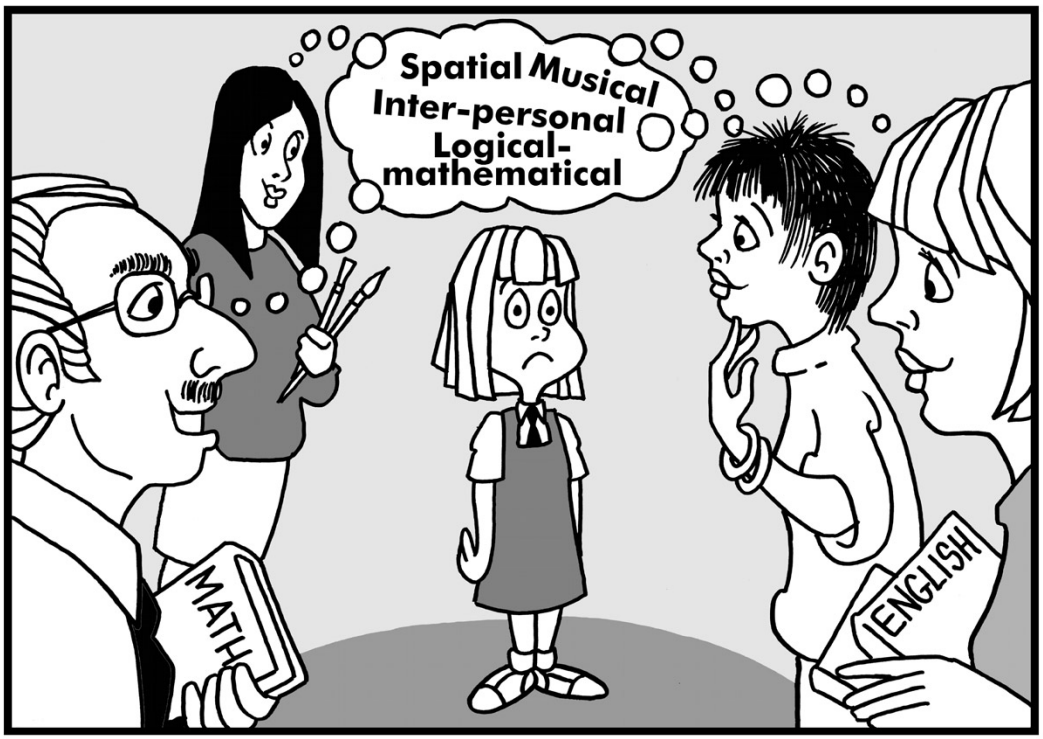
- Don't attempt to teach all concepts or subjects using all of the intelligences. 'Applying a scattershot approach to each topic is a waste of time and effort.'
- Don't believe that going through certain motions activates or exercises specific intelligences.
- Don't use intelligences primarily as memory devices. 'It may be easier to remember a list if one sings or dances to it. However these uses of the "materials" of an intelligence are essentially trivial.'
- Don't conflate intelligences with other desired outcomes. 'Interpersonal intelligence, the understanding of other people, is often distorted as a program for cooperative learning or as a playground for extraverts. Intrapersonal intelligence, the understanding of oneself, is often misused as a rationale for self-esteem programs or is attributed to introverts. These distortions and misapplications suggest a shallow (or nonexistent) understanding of my writings on intelligence.'
- Don't label people in terms of 'their' intelligence. 'People so labelled may then be seen as capable of working or learning only in certain ways, a characteristic that is almost never true.'

(Direct quotations in the above section are taken from Gardner, 1999, pp. 89-91).

Keep your eyes open!

Like the fabled blind men with the elephant, each of us tends to see the qualities in students which are closest to hand. Too often, we are blind to the richness of the whole child. There is the risk that, if we accept MI theory unquestioningly, without heeding Gardner's own warnings, we may adopt rather uni-dimensional perceptions of our students.

If you see one talent in a student, look for others!



Splitting infinities

Beware seductive theories.

Try not to be beguiled.

Our kids are individuals

no matter how they're styled.

A teacher's not infallible

and kids can get misfiled

if each sees what he values

and no one sees the child.

– *Miraca Gross*

The Principal's role in implementing a 'multiple intelligences' curriculum

If your school is working on a 'multiple intelligences' curriculum there are some issues that you may need to consider.

The first issue raised by Gardner in his list of things to avoid is extremely important. Trying to force-fit all 7 (or 8, 9 or 10) 'intelligences' to a topic in a curriculum unit is, as Gardner points out, a waste of time. Furthermore, this can destroy the integrity and rigour of some subjects. Attempting to develop 'bodily-kinaesthetic intelligence' in maths by getting children to form numbers with their bodies is not maths. Trying to foster 'linguistic intelligence' by creating science-related words out of the chemical table of elements is not chemistry.

Creating original and 'fun' activities for all is not the same as differentiating the curriculum for gifted students. MI curricula should be submitted to Passow's three 'key questions' just as stringently as we would submit any other curricula we intend to present to our gifted students.

Would all students want to be involved in these learning experiences?

Could all students participate in these learning experiences?

Should all students be expected to succeed in these learning experiences?

If the answer to any of these questions is **yes** the curriculum is **not** appropriately differentiated for your gifted students. It is not pitched at the level, pace and degree of abstraction that are needed by students who are gifted or talented in the subject area or areas in which the curriculum is set.

Unless MI curriculum is overlaid with challenging, higher-level tasks developed through the models of Bloom, Maker, Kaplan or Williams, it is unlikely that it will serve the needs of gifted students.

A number of schools are using Bloom/Gardner grids developed by commercial publishers. This can be a useful way of synthesising these two models. However, the ideas and activities presented still have to be submitted to Passow's 'trinity' of questions. The majority of commercial curriculum materials are developed to match the capabilities and needs of the majority of students — so these materials may not provide an optimal match with the needs of gifted students. You may want to use the ideas provided in commercially developed books or kits as 'foundation' ideas on to which your staff can build greater rigour and higher levels of abstraction.

Commercial materials may provide excellent 'horizontal enrichment' but may be much less suitable for **extension**. This will be discussed further in Specialisation Module 5.

Talent searches

'What is honoured in a country will be cultivated there.' (Plato)

National Talent Searches have existed for thousands of years. While the earliest talent searches were designed to secure the safety of a nation or empire, and assist in its administration or defence, modern talent searches are designed to identify young people who possess high levels of some aptitude or ability that their country or community values, and to assist them to develop these gifts into talents.

Chinese 'Public Service' talent searches

The oldest talent search that we know of was developed as early as the second century BC and was designed to identify highly able young people who could be trained to occupy positions of responsibility in the administrative bureaucracy that governed the vast Chinese empire. Several dialects of Chinese were spoken throughout the empire and people from different regions could not easily converse, so a strong emphasis was placed on literacy in the common **written** language which had been developed specifically for this purpose.

A three-tier selection process was set in place with applicants for positions in the Public Service passing through an increasingly rigorous series of tasks. By the 12th century AD, while linguistic mastery was still extremely important, administrators were also promoted on their knowledge of the geography of the empire, law, military affairs, agriculture and taxes, and their command of statescraft and administrative skills.

The Chinese emphasis on objective assessment under examination conditions which were designed to be scrupulously fair became an important element in the talent searches later developed by other nations and cultures. Examinations for entry to the introductory ranks of the Public Service were held in the chief city of each district and the questions and test conditions were designed to be identical. It is interesting to note how the principles of assessment developed in ancient China still influence modern testing procedures.

- While the Public Service Talent Search did not begin till the second century BC, China had used proficiency testing to determine hiring and promotion as early as 2200 BC.
- These tests assessed the specific skills which the applicant would require in the job for which he was being considered. For centuries before Confucius there were job-sample tests in music, archery, horsemanship, writing and arithmetic.
- Participants in the Public Service Talent Searches passed through a series of carefully graded, increasingly rigorous, tests.
- Testing sessions were systematically administered to ensure consistency.
- Examiners were specially trained in scoring techniques to ensure inter-rater reliability.
- Scrupulous attention was paid to anonymity in scoring.
- Tests were revised to suit changing times and changing needs.

While the Chinese empire greatly honoured its senior administrators, the Mandarins, they were regarded firstly as servants of the empire and the rigour and objectivity of the selection procedures were designed to ensure that the empire's administrators were chosen for their ability to provide outstanding service. This was highly unusual for its time: in many other cultures the top jobs went to family members of the monarch or emperor with little regard for their experience or ability!

The Ottoman empire talent search

From the 14th to the 16th century the huge Ottoman (Turkish) empire was governed by administrators selected deliberately from a talent pool of gifted and highly educated slaves who owed their lives, careers and good fortune to the Sultan and would be unlikely to rebel against him.

Each year, talent searchers were dispatched throughout the empire to seek young boys who showed high intellectual ability or physical prowess. These children were taken forcibly from their homes and were transported back to Constantinople. The children were assessed by an examining panel which asked them questions resembling those in modern IQ tests. The brightest of them were selected as student 'pages' and the very brightest were sent to the Palace School to be educated. The young people who had been selected on the basis of their physical prowess were trained as soldiers, with the strongest and most physically gifted being reserved for the elite corps of Janissaries.

The pages were not simply junior servants; they were empire administrators in training. The promotion system in the school was on merit, resembling that of the Turkish Government and also reminiscent of the Chinese Public service. The curriculum was broad, including oral and written fluency in Turkish, Arabic and Persian, these being the main languages of the empire. The young pages also studied law, philosophy, mathematics, science, theology and music. There was also constant physical exercise with special attention paid to horsemanship; the Sultans believed that a healthy mind functioned best in a healthy body. After a rigorous and carefully tailored education lasting approximately 14 years, many of the graduate pages were sent back to the country of their origin — still part of the vast empire — to govern their own former people on behalf of the Sultan.

The birth of modern talent searches

Modern talent searches have their origin in the vision of one remarkable man, Professor Julian Stanley of Johns Hopkins University in Baltimore, USA. In 1968 he encountered, by chance, a highly gifted 12-year-old boy with a remarkable gift for computing who was helping graduate students with Fortran. Stanley became aware that the boy also had an astonishing gift for mathematics, but age-appropriate tests were powerless to assess the full extent of his abilities (Colangelo, Assouline & Gross, 2004).

Stanley assessed the boy on the Scholastic Aptitude Tests (SAT) of maths and language used to assess 12th grade American students for college entrance — and despite being at least five years younger than the age-group the tests were designed for, he did exceptionally well. Stanley tried to intervene for the boy with several local high schools, to allow him to take accelerated programs in his talent areas, but all refused. The boy was socially and emotionally mature for his

age and the curriculum designed for his age-peers had little relevance for him; he had passed through most of the work years before. Eventually, with the support of Julian Stanley, he enrolled in undergraduate studies at Johns Hopkins where he graduated with both a BA and MA at age 17 — a striking example of successful radical acceleration.

Stanley became aware that there could be many such young people across the United States — perhaps not students who would be emotionally ready for college entrance but certainly students who could benefit from a more academically challenging curriculum in middle school and high school. In 1971 the Spencer Foundation gave him a generous financial grant to find and assist mathematically talented students who needed something more and different if they were to fulfil their potential. The modern Talent Search was born.

Today, many nations, including the USA, Canada, Australia, China, Singapore and Israel run academic talent searches. Talent searches offer a challenging test designed for older students to younger, bright, highly motivated students who already show unusual aptitude in a specific domain. Academic talent searches use aptitude tests rather than achievement tests; aptitude tests allow gifted students to use their reasoning abilities to solve problems even if the context is unfamiliar (Lupkowski-Shoplik, Benbow, Assouline & Brody, 2003).

Talent searches begin with a two-step process. The first stage is to identify students who have high ability in the field of the talent search and who would benefit from off-level assessment. This is usually based on their existing scores on an age-appropriate test — in general somewhere at or beyond the 95th percentile. The second stage is to assess these students on the off-level test which is generally designed for students three or more years older.

Typically, when students scoring in the top ranges of a test are assessed on an above-level test, a new 'bell curve' of scores appears with some of these gifted students scoring at the lower end of the new curve, some in the middle ranges, and some at the top end. **This does not mean that the students scoring below average on the above level test have 'failed' the test.** It is impossible to 'fail' a test of material one has not been taught. Indeed, a student's score on an off-level test should not be thought of as 'success' or 'failure' — **all** students sitting an off-level test have, by definition, already demonstrated high level aptitude on the age-appropriate test.

Scores on an off-level test can, however, assist teachers to discriminate between **different** levels of high ability. Jan, a gifted Year 5 student who scores at the 85th percentile on a test of maths designed for students in Year 8 has a higher level of maths aptitude than her classmate Steve who scores at the 30th percentile on that same off-level test — even though Steve is **still** gifted. Both Jan and Steve scored at the 95th percentile on the Year 5 test!

It would have been difficult for Jan and Steve's maths teacher to develop an appropriately differentiated maths curriculum for these two students on the basis of their on-level test scores — the on-level tests did not have sufficient discriminatory power. The off-level test, however, clearly shows that Jan's maths aptitude — and therefore her maths curriculum needs — are very different from Steve's.

Australian National Talent Search

Given Australia's passion for sport and athletics, and our justified admiration for, and desire to assist, young people talented in these areas, it is perhaps not surprising that our country's first talent search was, and still is, dedicated to identifying and fostering gifted young athletes and sportspersons. In 1994, as part of the lead-up to the 2000 Olympics, the Federal Government allocated $500,000 per year for two years to establish a talent identification program. The purpose of this program, which became known as Talent Search, was to identify athletic and sporting talent and to fast-track athletes for the Olympics. Eight sports — athletics, cycling, canoeing, swimming, rowing, triathlon, water polo and weightlifting — were chosen for inclusion and the target group for identification was gifted young people aged 14-16 years. This meant that the young athletes would be 20-22 years old in 2000. Talent Search coordinators were employed and based at each of the state academies or institutes of sport.

Talent Search had three phases:

> **School screening**. Equivalent to on-level testing in academic talent searches, this consisted of screening in the school environment using a battery of eight physical and psychological tests.
>
> **Sport-specific testing**. Students who scored in the top 2% on any of the eight tests were invited to participate in Phase 2 — off-level testing to assess for higher level talent in any one of the eight targeted sports. This phase equated, in some ways, to off-level testing in academic subjects.
>
> **Talented athlete program**. Students identified as having talent in a specific sport were invited to join a talented athlete program organised by a state or national organisation within their sport.

Funding and organisation arrangements have changed over the years and a much wider range of sports is now included but the program still follows the traditional talent search pattern of initial identification, off-level assessment and provision of appropriate training. Talent Search offers free talent identification to secondary schools and their students, and schools generally put forward, for this special assessment, students who are believed to have above-average potential. The age range is usually 11-18 although, as originally, most students tested are in the age 14-16 range. Those identified as having talent as a result of the special assessment are invited to develop their talent in either a quality sports program or a formal Talent Identification program.

> **Phase 1:** Tests are conducted by students' schools based on simple measures that would often be used to test student fitness. The students' results are then submitted to the local Talent Search Coordinator to be carefully scrutinised. Promising students are then invited to participate in Phase 2 testing.
>
> **Phase 2:** These tests may be somewhat similar to Phase 1 tests or they may be advanced sports-specific tests but they are conducted with more advanced scientific equipment, resulting in greater accuracy of results.
>
> **Phase 3:** Students whose tests have revealed favourable characteristics for a particular sport are invited to join a talented athlete program. Specialised coaching is provided to nurture the athlete and fast-track their development. The athlete is provided with an individualised program structured to the athlete's level of ability and level of development.

An important element in talent searches is that students are not exposed to off-level testing unless they have first **demonstrated** high aptitude on an on-level test.

Australia's sports and athletics Talent Search follows the classic talent search program; (1) identification through on-level testing; (2) confirmation and refinement of identification through off-level assessment; and (3) provision of advice on suitable avenues of talent development.

Where this talent search differs from most **academic** talent searches, however, lies in the fact that funding is also provided to directly **assist** the talented young person to develop his or her sporting or athletic talents, not only through individualised coaching and mentorship but also through ability grouping and acceleration — even through many Australian teachers still refuse to use the last two provisions with academically gifted students!

The website of the Australian Institute of Sport has a wealth of useful information on the Talent Identification program which provides outstanding opportunities for young Australians with special aptitude in sport and athletics to develop their gifts into talents.

Access http://www.ais.org.au/ and follow the links to Talent Search.

The Australian Primary Talent Search (APTS) and the Australian Secondary School Educational Talent Search (ASSETS)

APTS and ASSETS are not competitions. They are testing programs for academically gifted students, initiated by the Gifted Education Research, Resource and Information Centre (GERRIC) at the University of New South Wales, in association with the Belin-Blank International Center for Gifted Education and Talent Development at the University of Iowa.

APTS tests gifted students in Years 4-6. Since 1998 more than 12,000 academically gifted primary students in every state of Australia have participated in APTS. ASSETS tests gifted students in Years 7-9 (even in states where primary school continues into Year 7). ASSETS commenced in 2004. Over 2004 and 2005 almost 1,000 students from every state in Australia have participated in the program.

Like other talent searches, APTS and ASSETS employ off-level testing to assess the true levels of aptitude of students who have already been identified as having high ability. Identifying gifted students is critical; without appropriate academic challenge these young people may not fully develop their gifts into talents.

Professor Michael Pyryt has pointed out that a highly gifted Year 3 student who already knows and understands more, in maths, than the average Year 8 student, faces 50,000 minutes of potential boredom in Years 4-8 (50 minutes a day for 1,000 days) completing assignments on concepts he or she has already mastered! This student needs a significantly accelerated pace of instruction, opportunities to research topics in depth, opportunities to explore topics of interest and opportunities to interact with peers of similar ability. But this won't happen if this student's teacher is unaware of the full extent of his or her ability.

GERRIC sends, to parents of students who participate in APTS and ASSETS, two copies of the student's results on the off-level test. Parents are encouraged to give a copy to the student's school so that the child's teacher and school Principal can be aware of his or her scores on the subjects assessed by the test. Schools can then act on this important information.

Students who enter APTS take a test called EXPLORE. EXPLORE is a multiple-choice test developed by American College Testing (ACT) as a test for 8th grade students. The off-level test used in ASSETS is a special version of the ACT Assessment developed to assess Year 11 and 12 students in the United States for university entry. EXPLORE and the ACT Assessment measure academic aptitude in four subjects, English, maths, reading and science reasoning. The total time involved for APTS is approximately three hours, including testing and breaks. ASSETS takes half an hour longer.

Sample questions from EXPLORE and the ACT Assessment can be viewed on the GERRIC website (http://gerric.arts.unsw.edu.au). APTS and ASSETS testing is held once each year, generally in May, at a number of centres in each state and territory, including rural and remote centres. Testing is held on a Saturday morning but students whose religious faith precludes them from testing on a Saturday may be able to register for testing on the following Sunday at a smaller number of sites around Australia.

Who is recommended to participate in APTS and ASSETS?

Precise details of this can be found on the GERRIC website but broadly, APTS is open to students in Year 4-6 and ASSETS to any students in Years 7-9:

- who have scored in the 95th percentile on an individual or group IQ test (IQ 125+) or on an achievement test in any academic subject area,
- who have scored in the top band on any state's 'Basic Skills' test (LAP in Victoria),
- who have gained placement in certain types of gifted program (eg, Opportunity Class in NSW, PEAC program in WA),
- who have gained a Distinction or High Distinction in the Australian Schools Maths, Science or English Competitions,
- who have won an academic scholarship, or
- whose teachers believe them to be in the top 5% of academic ability for their age.

Please see the website for the precise entry criteria for which students must provide evidence.

How do students benefit from APTS or ASSETS?

- Taking EXPLORE or the ACT Assessment allows students to demonstrate unusual academic strengths in one or several key academic areas by taking an academically challenging test at a level that is not usually set at the Year levels in which they are enrolled. This information can be used by the student's school in planning appropriate curricular and programming modifications.
- Students gaining outstanding individual scores are acknowledged in a formal recognition ceremony at the University of New South Wales.
- Students scoring significantly above their Year level are eligible to participate in a range of GERRIC programs which have been developed specifically for high scoring APTS and ASSETS students.

How do families benefit from APTS or ASSETS?

- Families receive two copies of a comprehensive written report on the student's performance in the four subject areas. This includes recommendations for curriculum readiness. Families are encouraged to give the second copy to the student's school.
- Families are regularly informed of courses and programs for gifted students offered through GERRIC, including a range of student programs in school vacations, as well as courses and seminars regularly held for parents of gifted children.
- Families have the opportunity to participate in research to further assist gifted children.

The experience of participating in APTS or ASSETS offers many advantages to gifted students. For many, it is their first opportunity to test themselves against material that truly challenges them. The tests allow gifted students to stretch their mental muscles. It can be an affirming and indeed exhilarating experience. The experience also allows gifted students to develop better test-taking skills in a non-threatening atmosphere.

How do schools benefit from APTS or ASSETS?

These two nationwide talent searches provide objective identification of students talented in four key learning areas. Parents receive two copies of a comprehensive report which gives precise information on how the student compares with other Australian students taking the same test and also how he or she compares against the normative sample of students some years older. GERRIC encourages families to give the second copy to the student's school.

With the score reports comes a comprehensive analysis of the student's relative strengths and weaknesses across the four subject areas. Schools can use this to plan more closely individualised programs than would be possible without this sort of information. Increasingly, schools are using the practical information from APTS and ASSETS results to provide appropriate educational responses for their academically gifted students.

More than 50% of the gifted Year 4-6 students participating in APTS score above the average for Year 8 students! More than 50% of the gifted Year 7-9 students participating in ASSETS score above the average for Year 11-12 students! APTS and ASSETS reveal the wealth of talent — often hidden talent — in Australian schools.

Schools across Australia act as test sites for APTS and ASSETS. If your school would be interested in becoming a test site, or if you would like printed material about these Talent Searches which you could give to parents, email gerric@unsw.edu.au or fax (02) 9385 1973.

ct ROLE
u LOCALITY

Pia is in Ms Taylor's Year 4 class but Ms Taylor likes to say she is 9 going on 13 — however, she hastily qualifies this by saying that Pia is the most balanced 'adolescent' she's ever encountered! Her reading interests are mature and quite different from those of her classmates; indeed Ms Taylor sometimes brings in books that her own teenage daughter has enjoyed, knowing that Pia will enjoy them too. She is not quite so highly developed in maths but she is certainly beyond Year 4 level.

Ms Taylor wants to know more about Pia's abilities in maths and reading — and she also wants to know how she can assist the girl further. Pia lives in a large city with many resources. What might Ms Taylor do?

ct ROLE
r LOCALITY

Jana is a Year 4 student in Mrs Watson's Year 3/4 class in a small country school but Mrs Watson likes to say she is 9 going on 13 — however, she hastily qualifies this by saying that Jana is the most balanced 'adolescent' she's ever encountered! Her reading interests are mature and quite different from those of her classmates; indeed Mrs Watson sometimes brings in books that her own teenage daughter has enjoyed, knowing that Jana will enjoy them too. She is not quite so highly developed in maths but she is certainly beyond Year 4 level.

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p ROLE
es ROLE
u LOCALITY

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Ms Taylor wants to know more about Pia's abilities in maths and reading — and she also wants to know how she can assist the girl further. She has come to you for advice. What options does Ms Taylor have?

p ROLE
es ROLE
r LOCALITY

Jana is a Year 4 student in Mrs Watson's Year 3/4 class in your small country school but Mrs Watson likes to say she is 9 going on 13 — however, she hastily qualifies this by saying that Jana is the most balanced 'adolescent' she's ever encountered! Her reading interests are mature and quite different from those of her classmates; indeed Mrs Watson sometimes brings in books that her own teenage daughter has enjoyed, knowing that Jana will enjoy them too. She is not quite so highly developed in maths but she is certainly beyond Year 4 level.

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The first thing Ms Taylor needs to do is make a more accurate assessment of Pia's levels of ability in reading and maths — and probably some other subjects as well. Such high levels of achievement in two subject areas are a good predictor of high general ability.

Off-level testing is clearly indicated here. A useful starting point would be to give Pia a standardised test of maths aptitude or achievement developed for students of her age. This will give Ms Taylor objective evidence of where Pia stands in relation to her age-peers. If she scores in the top 10-15% this will indicate that there may be a ceiling effect for Pia on this particular test and that off-level testing would be advisable.

Ms Taylor could then assess Pia's maths ability using a standardised test designed for Year 5 or 6 students. If she wanted to make a less formal assessment first, she could ask one of the Year 5 or 6 teachers to lend her a teacher-made test that they use with their own class.

However, as there is some overlap between the maths curriculum of Years 4, 5 and 6, a test that is even more 'off-level' may be required. If Pia performs well on the on-level test, as she probably would, Ms Taylor could talk to her parents about the possibility of her participating in the Australian Primary Talent Search. As Pia lives in a large city, she would have the choice of several test sites. Maybe her own school could apply to be a site!

Pia's mother could share with the school the comprehensive report she would receive on Pia's scores, not only in reading and maths, which are the talent areas Ms Taylor has noticed, but also in English and science.

Either through the APTS testing or through off-level testing she conducts in her own classroom — or both! — Ms Taylor now has a picture of how far beyond Year level Pia's achievement levels really are, and she can make a more informed decision about how to differentiate the curriculum to meet the girl's learning needs.

Perhaps Pia could go to the Year level above for reading or maths. Perhaps the school could develop a pullout program for students with unusual reading abilities. Modules 5 and 6 in this Professional Development Package provide practical information on a range of curriculum models and program models that Ms Taylor and her colleagues could use to respond to the learning needs of Pia and the other gifted children in the school.

As she lives in a city there are many other opportunities for Pia to access enjoyable and challenging activities. Each state has a gifted children's association and many of these provide weekend enrichment activities, as do some universities. Special interest clubs can provide excellent enrichment and access to other students with similar interests.

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Mrs Watson could then assess Jana's maths ability using a standardised test designed for Year 5 or 6 students. If she wanted to make a less formal assessment first, she could ask Ms Davis, who teaches Year 5/6, to lend her a teacher-made test that she uses with her own class.

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You could facilitate your staff's use of off-level testing by encouraging them to keep copies of tests which they have developed for their class, and which they feel have worked well, so that teachers of younger classes could use these for off-level assessment. Your school should also have a 'library' of standardised tests that teachers can use. The Australian Council for Educational Research (ACER) is an excellent source for these tests.

However, as there is some overlap between the maths curriculum of Years 4, 5 and 6, a test that is even more 'off-level' may be required. Talk to your staff about the Australian Primary Talent Search (APTS). If Pia performs well on the on-level test, as she probably would, Ms Taylor could talk to her parents about the possibility of her participating in APTS. There may well be other gifted students in Years 4-6 who could also benefit. As your school is in a city, your students would have the choice of several test sites. Maybe you could apply for your own school to be a site!

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Part 2

Longitudinal studies: Gifted students growing up

Longitudinal studies are one of the rarest but most valuable forms of research. They are thin on the ground probably because they are so very time-consuming for the researcher! But we have learned a great deal from some of the better known studies which have followed gifted young people from their early childhood into adulthood. In particular we can look at some of the long-term effects of various interventions such as acceleration.

One of the earliest longitudinal studies of gifted children is also famous as being the longest longitudinal study **ever** conducted!

The Terman study

Lewis Terman, a psychologist based at Stanford University in California, conducted a monumental study which began in the early 1920s with 1,528 gifted children of IQ 135 and above. On his death in 1956 his colleagues continued with the study and it has passed through several generations of researchers. Today, in 2005, the study is still ongoing. The subjects who are still alive are in their nineties. Five books which provided major reports on the study were published between 1925 and 1995 and it has been the subject of numerous articles.

To find his subjects Terman canvassed schools across California. Initial nomination was by teachers. Terman asked teachers to nominate, to the study, the children in their classes whom they thought were the most intellectually able — and also the youngest child in the class. Acceleration was used much more commonly in the first quarter of the 20th century than it is today; academically talented students who were also socially and emotionally mature were often allowed to grade advance, therefore the youngest child in a class could well be a gifted child who had accelerated. Children who were nominated to the study were given individual intelligence tests using the then current version of the Stanford-Binet Intelligence Scale.

Terman and his colleagues collected an enormous amount of information about the children. Parents completed a lengthy questionnaire about the home. Teachers completed a somewhat shorter questionnaire about the children's schoolwork. The children were given a medical examination and their height, weight and other physical characteristics were recorded. The children completed a questionnaire about their hobbies and personal interests and also a record of books they had read during the preceding two months. They also completed a questionnaire about their play interests and took a set of seven personality inventories which assessed emotional stability and aspects of social and emotional development. Importantly, similar data were collected on randomly selected children of similar ages so that Terman could compare the gifted sample with a control group of age-peers.

An unfortunate perception of gifted children, which was extremely strong in Terman's time and which lingers even today, is that intellectually gifted students are weedy, undersized weaklings. Terman's findings came as a profound shock to those who wanted to believe that nature compensates for giving some individuals superior intelligence by bestowing on them inferior bodies. The gifted children tended to be taller, stronger, more physically robust and less prone to childhood ailments or accidents than were the comparison group children. They also reached puberty earlier. Subsequent studies (eg, Hollingworth, 1942; Gross, 2004; Gottfried, Gottfried, Bathurst & Guerin, 1994) have shown similar findings.

One of the most persistent myths about the Terman study is that the children came from middle-class families. Certainly some did but many did not. However, they were bright young people whose families tended to value education. Because of this, a greater proportion of the Terman subjects went on to tertiary study than was common for their generation. They entered occupations that paid well and, through upward mobility, they **became** middle class and their children were brought up in a middle class lifestyle. It is important to note this because some of the early critics of Terman's study attributed the physical superiority and better health of the Terman subjects to social advantage. However, Florence Goodenough, one of Terman's research assistants, believed that it was due to a generally higher standard of diet and medical care in their homes. Additionally, as Australian researcher Louise Porter has recently pointed out (Porter, 2005), gifted children tend to have fewer childhood accidents because they tend to think more about what they are doing!

Terman's group and education

Almost half of Terman's subjects could read before school entry and on standardised tests of academic achievement they consistently scored, on average, 40% ahead of their age-peers as they progressed through school. Twenty per cent were permitted to skip all or part of first grade and by the time they graduated from high school 10% had skipped two grades and a further 23% had skipped one (Terman & Oden, 1947). In high school, despite so many of them being younger than their classmates, they consistently scored in the top 10% of their classes in achievement. They enjoyed school — many of them, in middle age, spoke reminiscently about the support and encouragement they had received both from their families and from their teachers — and many more went on to college than was customary at that time. Indeed, around 65% of the men and almost 60% of the women went on to take further degrees. Laycock (1979) points out how remarkable this is because most were undertaking tertiary studies during the economic depression of the 1930s when the proportion of women graduating from college was very much smaller.

While Terman was proud of the academic achievements of his subjects, and happy for them, he was concerned that so many of these academically brilliant young people (more than 10% of the men and more than 15% of the women) did not attend college and 30% of those who did, did not graduate. However, again we must remember that the 1930s was a difficult time, financially, for many people. Terman noted that parental inability to fund college attendance was a significant hindrance for substantial numbers of those who did not attend or graduate.

An interesting finding of the study is that students who had accelerated in primary or secondary school were more likely to enter postgraduate study than equally gifted students who had not, and they were also more likely to complete postgraduate study successfully. A survey undertaken in 1977, when the average age of the group was 67, asked them to look back on their

lives and rate the satisfaction they had found in various areas. The responses of people who had been accelerated were generally more positive than those of people who had not. Accelerands reported significantly greater satisfaction in their work, in recreational activities, and, interestingly, in social activities and friendships, than did non-accelerands (Cronbach, 1996).

Terman and his colleagues concluded that, in general, academically gifted students of IQ 140 or above 'should be promoted sufficiently to permit college entrance by the age of 17 at latest and that a majority in this group would be better off to enter at 16' (Terman & Oden, 1959, p. 72). Certainly, as we will discuss later, for exceptionally gifted children this seems to be pretty sound advice.

Terman's group and careers

As with education, the careers of the Terman group reflect the era in which the study was set. By the time of the 1957 survey more than half the women were housewives with no steady outside employment. Of those who did have jobs, the largest group was in teaching and the next largest in business, as secretarial or administrative assistants. The women who did have professional careers tended to do extremely well; there were women with distinguished careers in science, art, education, writing and business. In 1954 Terman recorded the accomplishments of his group, showing that by age 40 they had written 67 books, more than 1,400 articles in professional or research journals and more than 400 short stories or plays. He pointed out that this was 10 to 30 times as large as could be expected for 800 randomly chosen people of the same age (Terman, 1954).

In the middle and later years of the study, Terman's research team compared men who were rated as 'most successful' and 'least successful' in their careers. One of the strongest findings was that the 'most successful' group had, as children, parents who themselves had significantly higher education than was was usual for the time, and who passed on a strong valuing of education to their children, while the families of the 'least successful' group had much less encouragement and valued education less. Another strong but unsurprising difference is that the 'most successful' had a much stronger drive to achieve than did the least successful group. There is no evidence, however, that these groups were distinguishable, in childhood, in terms of motivation.

Interests of the Terman group

In childhood, the Terman group showed many of the characteristics of gifted children which we have already discussed in previous Modules. Reading was consistently a favourite occupation in childhood: Terman's assessment of the children's reading abilities and interests showed that, at age 7, the average child in the group read more books than the average 15 year old! In addition, the books they read were more like those enjoyed by older children or adolescents. This love of reading continued into the adult years.

The games Terman's subjects loved as children tended to be more like those enjoyed by children several years older. A characteristic which Terman's team noted which has also been noted in later studies (eg, Hollingworth, 1942; Gross, 2004) was a propensity to want to change the rules of games to make them more interesting or challenging. This can be misinterpreted and resented by other children who assume that the gifted child is cheating!

The most recent report of the study has re-emphasised the degree to which the higher intellectual ability of the Terman children influenced so many aspects of their development as young people:

> *'Throughout the school years and into adolescence these children's interests, attitudes and knowledge developed in correspondence with their mental age rather than with their chronological age. Their academic achievement as measured by tests, their interest and liking for various future occupational careers, their knowledge about and interest in games, their choice of recreational reading materials, and their moral judgments about hypothetical conduct were all characteristic of older non-gifted children whose mental age-range was approximated by this much younger and brighter group. Even the intellectual level of their collections was more mature than that of their chronological age-mates' (Holahan & Sears, 1995, p. 16).*

We noted, in Extension Module 3, the propensity of parents of gifted students to become involved with community organisations — often charities which support children with special needs or families in difficulties — to which they give voluntary service, often over many years and often as unpaid administrators. Terman reported this in the earliest volumes of his study, as being a characteristics of the parents of his gifted group, and his research team described how, as the gifted group grew up, many of them continued this 'tradition' of service. 'Their roles as volunteers often included responsibility and influence comparable to those of many paid occupations' (Holahan & Sears, 1995, p. 97).

Contributions of the Terman study

The Terman study demolished many myths about gifted and talented students which had affected community attitudes towards these young people. In the first quarter of the 20th century, and for many years before, people had associated high intellectual ability in children with physical and even emotional weakness — the skinny, bespectacled 'nerd' who shuns exercise and outdoor activities and who is prone to accidents and childhood ailments. There was even a belief in 'early ripen, early rot' — the idea that academic brilliance in childhood would lead to 'burn-out' in adolescence. Terman showed that the physical and emotional health of gifted children tended to be superior to that of age-peers and that, with family and school support, high abilities were translated into high achievements and lifetime productivity. The study also demonstrated that acceleration caused no social or academic difficulties; indeed, by contrast, gifted students who were accelerated experienced greater school and college success, and reported greater satisfaction with many aspects of their lives, even in middle age and after, than did equally gifted students who were not permitted to accelerate.

The Study of Mathematically Precocious Youth (SMPY)

The best known, and most extensive longitudinal study of modern times is the Study of Mathematically Precocious Youth which was initiated by Professor Julian Stanley as an important element of his Talent Search which we reported earlier in this Module.

In Australia we tend to use the term 'precocious' in a derogatory sense to describe a child who behaves in an ostentatious manner — a show-off or 'smartypants'. What the term really denotes, however, is unusually early development. SMPY is a study of students who are unusually gifted in maths and are capable of performing at levels well beyond what would be expected for their age.

Stanley and his associates, principally Professors Camilla Benbow and David Lubinski of Vanderbilt University, are in the fourth decade of a planned 50-year study of 5,000 mathematically or verbally gifted adults who scored, as adolescents, on the Maths or Verbal scales of the Scholastic Aptitude Tests, at a level that would place them in the top 1% of the population.

The study has some interesting findings.

- Mathematically and verbally gifted children use problem solving strategies that do not seem to develop in children of average ability until some years later. It is not only that they are talented in maths or language; it is that they seem to engage with, and manipulate, maths or language in ways that are more characteristic of students several years older.
- They tend to possess an internal locus of control, accepting that they themselves are largely responsible for their academic successes or difficulties. They are less likely than their age-peers to attribute difficulties to external factors ('My teacher can't explain new concepts like Mr Jackson did last year; that's why I'm not doing so well at the moment') and, while in general they don't become conceited about their abilities, they are more likely to accept that they have unusual maths or verbal talents.
- Gifted students tend to be underserved both in primary and secondary school. Underachievement is imposed on many of them by an undemanding curriculum developed for students of average academic ability but quite unsuited in content, level and pace for students with specific maths or verbal talent.
- They tend to be well adjusted and have positive attitudes towards school. However, highly gifted students tend to experience more social difficulties at school, particularly in the case of verbally gifted girls who are often mocked for their mature and articulate speech. Mary Ann Swiatek found that verbally gifted students were more likely to conceal, or partly conceal, their abilities for peer acceptance than are mathematically gifted students (Swiatek, 1995). Gross (2004) suggested that this may be because a student with remarkable maths ability may feel the need to 'dumb down' mainly in maths classes, whereas a student whose vocabulary and modes of speech set her apart from age-peers may feel the need to be 'on guard' much more of the time.
- Talent Search participants tend to retain, and use, their high abilities. An investigation of one cohort of Talent Search participants when they were in their early 30s found that 90% of them had Bachelor's degrees while fully 25% held doctoral degrees (as against 1% of the American population having doctorates) (Benbow, Lubinski, Shea, & Eftekhari-Sanjani, 2000). Men and women in the study had equal educational attainments. As with the Terman study, the picture for these young people in adulthood is very far from the stereotyped 'early ripen, early rot' predictions.

- The highest achievers in the Talent Searches tend to maintain their superiority in adult life. In the late 1990s Lubinski, Webb, Morelock and Benbow (2001) surveyed Talent Search students from the early 1980s who had scored, on the SAT, at levels achieved by fewer than 1 in 10,000 in the population. More than 50% of these young people were already pursuing doctorates. Even though they were only in their 20s, many had published several articles or secured patents for their inventions. A sizeable number had already won prestigious awards in their fields.
- However, Talent Searches have also identified that achievement and success are by no means built in for gifted students. Where schools have not provided structured opportunities for talent development, these students perform, in school, and in later life, at levels significantly below their true capacity. As the Gagné model illustrated in Core Module 1, a facilitative school environment is required to promote the translation of high ability into high achievement. Gifts, no matter how profound, do not develop into talents unless the school accepts its responsibility to actively facilitate this process. Talent searches have noted significant differences, sometimes quite startling differences, in the adult achievements of equally gifted students whose schools have or have not provided special opportunities.

One intervention has proved effective beyond any other for Talent Search participants:

> 'Although the sheer number of studies on the short-term and long-term effects of the variety of accelerative experiences that are promoted by the various Talent Search programs is voluminous (Benbow & Stanley, 1996), the results can be summarised rather succinctly. When differences are found, they favor the accelerants over nonaccelerants irrespective of the mode of acceleration. And, Terman's data indicated this is true even 50 years after the acceleration occurred' (Cronbach, 1996).

The long-term effects of acceleration will be discussed briefly in the next section and in Specialisation Module 6. We also recommend that you access Professor David Lubinski's chapter in Volume 2 of *A nation deceived: How schools hold back America's brightest students*. This major gifted education report, published in September 2004, can be accessed and downloaded cost-free from its website: http://nationdeceived.org

An Australian Longitudinal Study

A study commenced in 1983 by Australian researcher Miraca Gross has followed the intellectual, academic, social and emotional development of 60 exceptionally and profoundly gifted young Australians who in childhood scored IQ 160 or above on the Stanford-Binet L-M when that version of the Stanford-Binet Intelligence Scale was still current (Gross, 1993). Children scoring at this level appear in the population at a ratio of 1:10,000 or fewer, and their academic and socio-affective development, and their educational and social needs, can differ radically from those of their age-peers. The majority of the young people are now in their mid-20s.

Influenced by the studies of Terman and Hollingworth, Gross collected a wealth of information about her subjects' academic development. At intervals during their primary and secondary school years, the children were given standardised tests of achievement in several academic subject areas. As in almost every case they 'ceilinged out' on age-appropriate tests, off-level testing was used to get a clearer understanding of the full extent of their abilities. Their tested levels of achievement were then compared with the levels of work they were permitted to undertake in class. This enabled Gross to judge the degree of 'fit' between the children's demonstrated achievement and the programs provided for them by their schools. In addition the children's school reports were examined to analyse their teachers' perceptions of their levels of ability and achievement.

In the 1980s and early 1990s Australian teachers were even less willing than they are now to employ standardised tests of aptitude and achievement. A lot of 'educated guessing' went on. The teacher of 7-year-old Jade wrote in her end-of-year report, that Jade's spelling was 'at grade level'; in fact, Jade's spelling age on the South Australian Spelling Test, which she was given as part of the study, was 9. Adam's Year 3 report stated that he 'could record addition and subtraction up to 20'; Adam had been performing at this level in his first year of school. Anastasia's Year 3 report read: 'She is to be commended in reaching the Year 2 and Year 3 objectives in mathematics'; Anastasia had actually scored at a 10-year-old level on a standardised test of maths.

This failure to use objective assessment led, in many cases, to teachers making serious underestimations of the children's abilities and, as a result, to some astonishing mismatches between student readiness and curriculum provision.

CASESTUDY

Ian Baker taught himself to read at an early age. By three he was reading small books and at preschool he enjoyed helping the teacher by reading aloud to the rest of the class while she prepared for the next lesson. When he realised that the other children could not see the illustrations, he developed the technique of holding the book upside down so that his classmates, seated round him, could see the pictures and follow the story as he pointed to the words. By the time Ian entered school he was reading, with keen pleasure and full comprehension, E.B. White's ***Charlotte's web****.*

Difficulties arose in the first few weeks. Although his mother had mentioned to the teacher that Ian was already an avid and fluent reader, the teacher was unwilling to believe this, nor was she willing to check this out by giving him a simple reading test. The situation was complicated by the fact that Ian had long since passed through the stage of needing to 'sound out' words and now read silently and absorbedly; his teacher, even when she did notice him reading, assumed that he was simply looking at the pictures. In consequence, she insisted that Ian work through the reading readiness exercises with the rest of the children. His maths achievement was likewise advanced but as the teacher refused to test this either, she remained unaware of it.

Ian's anger and resentment reached such a stage that the school decided to have him assessed by an educational psychologist. His IQ was assessed as at least 170, and tests of reading achievement established that he had the reading and comprehension skills of a 12-year-old. He was six years old.

Ian's school refused to accept the psychologist's recommendation that he be accelerated — even though he was remarkably gifted in most academic subject areas. While he was in Year 4, at the age of 9 years 11 months, for the purposes of Gross's study, Ian took the Scholastic Aptitude Test – Mathematics (SAT-M), a standardised test of maths achievement taken by American 17- and 18-year-olds wishing to enter university. He had ceilinged out on every primary and secondary school-age maths test Gross had previously given him. The average score on the SAT-M varies from year to year but is usually around 500. Ian, seven years younger than the students for whom the test is designed, made the remarkable score of 560! Despite this his teacher, who 'didn't believe in' standardised tests, insisted that he undertake the Year 4 maths curriculum with the other 9-year-olds.

Ian's story, from childhood to adulthood, is told in Miraca Gross's book ***Exceptionally gifted children*** *(Gross, 2004). Like most subjects in longitudinal studies, 'Ian' has chosen a pseudonym to protect his identity.*

The children and adolescents described in the case studies above are truly remarkable young people. Students like this appear rarely in our schools. By including their stories in this Module we are not suggesting that the majority of gifted students would be, or should be, capable of working at the levels which they have achieved. Rather, we are including these case studies to illustrate something we briefly alluded to in earlier Modules; that students at different levels of giftedness — mild, moderate, high, exceptional and profound — have different levels of academic ability and that we should not underestimate individual gifted students' capacity to learn.

If students like these can pass through years of schooling without their remarkable abilities being identified, how much more often may we be failing to identify and respond to more moderately gifted children?

Parents have known their children, and followed their development, for years before they enter the school system. Teachers should listen thoughtfully to what parents tell us about their children's early years. Rather than assuming that parents are biased or exaggerating when they describe unusual abilities in their children, we should use this informal 'parent nomination' and balance it with other forms of identification including, where possible, objective assessment on standardised tests of ability or achievement.

When her subjects were children and adolescents, Gross made regular surveys of the hours each child spent daily in voluntary reading, the title, author and subject classification of all materials read, the books which the children classed as current favourites, and their reasons for preferring these particular books. As with earlier studies of highly gifted children, Gross's surveys found that their reading interests were often very different from those of their age-peers and resembled those of older students. Indeed, they often read, with full comprehension and enjoyment, literature written for young people 5-7 years older.

This proved problematic, because, in general, by the time the children were in Years 3 or 4, their primary school libraries held no books which stimulated their interest. Indeed, some primary school libraries operated a kind of chronological apartheid with separate sections for junior, middle and senior primary students. This was extremely frustrating as most of these gifted children had already read the majority of books in 'their' section by the time they became old enough to access it! Similarly, many secondary school libraries had sections which only Year 11 and 12 students were permitted to access.

Inequity in 'equity'

Most of the young Australians in Gross's study undertook their primary education during the 1980s — in the era we described earlier in this Module as one of militant egalitarianism. In many schools 'equity' was confused with 'sameness' and suggestions that individual students should be 'singled out' for special treatment were frowned upon. Fortunately, children with intellectual or physical difficulties were exempted from this 'one size fits all' philosophy, as were children talented in sport and music, but the majority of academically gifted students were trapped by it. With a few notable exceptions such as the Selective High Schools and Opportunity Classes in New South Wales, the University High School acceleration program in Melbourne and a range of programs in Western Australia, schools kept gifted students with age-peers, and in mixed-ability

classes, and, in general, few teachers knew enough about the needs of gifted students to even consider differentiating the curriculum for them.

The 60 young Australians in Gross's study are some of the most intellectually gifted young people ever discovered. There is little doubt that all of them would have benefited from academic acceleration; instead, the majority were retained with age-peers for their entire schooling or permitted a single grade advancement. In several cases schools justified the decision not to accelerate these students on the grounds that it would be unfair to offer an 'advantage' to one child that could not be offered to all. The mother of one of the most highly gifted of Gross's subjects was informed that it would be a violation of the principles of social justice if her son was given any work which could not be mastered by the majority of students in his class.

We will discuss, in Specialisation Module 6, some of the research on 'radical acceleration'. This is usually defined as any combination of accelerative procedures which results in a student graduating from high school three or more years earlier than is customary. It is very rare indeed for radical acceleration to comprise a single, three-year, gradeskip. Usually the grade advancements are separated by periods of consolidation. Obviously, radical acceleration is rarely practised, firstly because it is suitable only for extremely gifted students who are very mature socially and emotionally and who are eager to move much more speedily through school, and secondly because most schools will not even consider it as an option.

When the 60 young adults are grouped in terms of the degree of acceleration permitted, some interesting patterns appear:

A Young people who have been radically accelerated

B Who accelerated by two years

C Who accelerated by one year

D Who were retained with age-peers for the whole of their schooling.

Group A: Radical accelerands

Surprisingly, when one considered the sociopolitical beliefs of the era they were educated in, 17 of the 60 young people in Gross's study were allowed to radically accelerate through school. None regrets his or her acceleration in any way. Those who would, in retrospect, have changed things, say they would probably have preferred to accelerate still further, or have started earlier. The extremely gifted young Americans from the SMPY study who were surveyed in their 30s by David Lubinski expressed exactly the same views (Lubinski et al., 2001).

Some of the young people had a rough start to school but things improved for them later — Hadley Bond, who became Australia's youngest school dropout at age five, is one of these — while others were fortunate enough to enrol, right from the start, in schools where a teacher or school administrator recognised their remarkable abilities and argued for a strongly individualised program. All 17 are characterised by a passionate love of learning and almost all have gone on to take PhDs.

Despite being some years younger than their classmates, the majority topped their state in specific academic subjects, won prestigious academic prizes or represented their country or state in Maths, Physics or Chemistry Olympiads. Several won scholarships to attend prestigious universities in Australia or overseas.

In every case, the radical accelerands have been able to form warm, lasting and deep friendships. They attribute this to the fact that their schools placed them, relatively early in their schooling, with older students to whom they tended to gravitate in any case. Those who experienced social isolation earlier say that it disappeared after the first gradeskip. Two of the radical accelerands are married with children. The majority are in permanent or serious love relationships. Interestingly, they tended to choose partners who are also highly gifted.

Group B: Two-year accelerands

The six young people who accelerated by two years report as much, or almost as much, personal satisfaction with their education as do the radical accelerands — although most say they would have very much liked another grade-skip. None regrets accelerating. They are less likely to do PhD study than Group A, but the majority have taken Bachelors (Honours) degrees.

They are almost as likely as Group A to report satisfactory personal and love relationships. However, members of this group who were not permitted acceleration until later in their schooling (eg Ian Baker, part of whose school history was told in the Primary and Secondary case studies above) tend to find socialising difficult. Exceptionally and profoundly gifted students should have their first acceleration in the early years of school before they experience the social rejection which seems to be a significant risk for extremely gifted students who are retained in the mixed-ability classes. The skills of friendship building (rather than just playing together) are first learned in the early years of school and children who are rejected by their peers may miss out on these early and important lessons in forming relationships.

Group C: One-year accelerands

Four of the young people were permitted a single grade advancement. These young people are not deeply satisfied with their education. Their school experience has not been happy. They would have loved to accelerate by more than one year. After the euphoria of having new, challenging work, school became just as boring as it had been before the acceleration.

Why did these students' schools refuse to accelerate them further, when the first acceleration has been so successful? In general, the schools were afraid that, while one grade-skip had worked, further acceleration might lead to social or emotional damage in later years. In two cases the school was concerned for the self-esteem of other students because the accelerated student was performing so much better than they were!

The Group C students have tended to take undergraduate degrees and stop there. Because they have not had the experience of pitching themselves successfully, and over a period of time, at work which is truly challenging and demanding, they have no idea of the full extent of their capacities. They tend to have low self-expectations. Because of this they have tended to enrol in undemanding academic courses and they have consequently found university intellectually unchallenging. It is with this group that a serious dissatisfaction with friendships and love relationships starts to appear. Two have had quite severe problems with social relationships. Again, if children are not given structured opportunities in childhood to interact with developmental peers, they may not easily develop the skills of building friendships.

Group D: Students not permitted acceleration

The remaining 33 young people were retained in a lockstep curriculum with age-peers in 'inclusion' classrooms. The last thing they feel is 'included'. With few exceptions, they have very jaded views of their education. Two dropped out of high school and a number have dropped out of university. Several more have had ongoing difficulties at university — not because of lack of ability but because they find it difficult to commit to undergraduate study which is less than stimulating. These young people consoled themselves through the wilderness years of undemanding and repetitive school curriculum with the promise that university would be different — exciting, intellectually rigorous, vibrant — and when it was not, as the first year of university often is not — it seemed to be the last straw.

David, now aged 26, speaks for many of this group:

> *'All through my schooling teachers would say, "Yes, I know you know most of this but hang on, next year will be different." But the next year would be just the same, and the year after that, and the year after that again. Year 12 wasn't quite so bad because the curriculum was new in some respects and I had the carrot of university the following year dangling in front of me to keep me going. By this stage it really was all that* ***did*** *keep me going. And I was shattered to find that first year uni maths was Year 12 all over again. And the pace was* ***still*** *too slow. I started to get really depressed and I went to the uni counselling service and you know what they said? "Yeah, first year's pretty boring. It'll be better next year." What I wanted to say was, "So when am I going to start learning?"'*

Several of the non-accelerands have serious and ongoing relationship problems. These young people find it very difficult to sustain friendships because, having been, to a large extent, socially isolated at school, they have had much less practice, in their formative years, in the 'give and take' of social relationships. Roger says wryly: 'Socially, I have three feet; two left feet and the third one that I seem to put in my mouth every time I open it.' A number have had counselling. Two have been treated for severe depression.

The positive or negative influences of educational decisions extend far beyond the classroom. The great scholar John Feldhusen once said that rather than worrying about the consequences of accelerating gifted students, we should turn our attention to the consequences of not accelerating them.

Early predictors of high academic achievement

We strongly suggest that primary and secondary teachers, as well as early childhood teachers, should read this section. Its purpose is to discuss the strong predictive validity, for later school success, of early precocity in speech, movement and reading. We should listen carefully to, rather than dismiss, parents' claims that their children or adolescents were unusually advanced in the early years of school.

It's the first day of the school year and Mrs Morrison has the intake class at your local primary school. 'Twenty-three unknown quantities,' she says to Ms Carson, the Principal. 'Who knows what they'll turn out like.'

'Keep an eye on little Tara Maxwell,' says Ms Carson. 'I had her mum in on Friday telling me that she's reading already. Mum says she taught herself to read when she was 4.'

'I'd take that with a pinch of salt,' says Mrs Morrison. 'Probably she saw the big golden "M" and said "McDonalds".'

Researchers doing longitudinal studies often encounter the same scepticism. The retrospective nature of much of the case study research on giftedness in early childhood leads people who take a wholly or largely environmentalist view of giftedness to suggest that records of early speech, movement or reading arise from flawed parental memory or inaccurate recording. 'How can you **prove** that the kids in your study learned to speak before the usual age?' someone will say. 'You weren't around at the time — and you can't afford to simply believe what parents say!'

Modern day researchers have it easier than Terman had. We have audiotapes and videos to assist us. However, in recent years, the Fullerton Longitudinal Study of early and later childhood development has provided empirical evidence of the developmental advancement of intellectually gifted young children (Gottfried et al., 1994).

The Fullerton Longitudinal Study

The Fullerton Study traced the development of 107 children who were recruited through birth notifications of hospitals adjacent to the Fullerton campus of California State University. The children, who were one year old at the commencement of the study, were given numerous developmental assessments right through the first eight years of life. At age eight, seven years after the study commenced, they were assessed on the Wechsler Intelligence Scale for Children – Revised (WISC-R) and the 20 children who made a full-scale IQ score of 130 were designated the gifted group for the purposes of comparison with the other 87 children. The IQ range in the gifted group was 130-145 with a mean of 137.6, while the range in the comparison group was 84-128 with a mean of 110.9.

The Fullerton team therefore possesses objective, systematically collected data on the early development of a group of children who were identified as gifted several years **after** they entered the study. This is not, therefore, a retrospective study, but a developmental study conducted **in current time** and the consistent superiority of the gifted group cannot be attributed to flawed memory or parental bias.

The Fullerton Study found that differences in the level of intellectual performance between the gifted and nongifted children appeared as early as one year of age, and were sustained throughout the study. Interestingly, the earliest difference was found at age one, **on entrance to the study**, in receptive language. The Fullerton Study consistently noted significant differences in expressive language from infancy onwards. Assessments of comprehension, gross and fine motor skill, memory, and personal-social development consistently found the gifted group superior. Indeed, the only academic skill on which the gifted children did not display significant superiority was on numeracy — and the researchers noted that this was due to a ceiling effect on the test for the gifted group! Indeed, the Fullerton team concluded:

> *'Gifted IQ implies generalized high intelligence. Gifted children were superior across an array of cognitive tasks beginning as early as the pre-school period. Gifted children tended to be cognitively well rounded or adept. Globality rather than specificity in cognitive performance characterizes intellectual giftedness.' (Gottfried et al., 1994, p. 85).*

Although, as might be expected from the relatively small sample size, the Fullerton Study included no exceptionally or profoundly gifted children — the highest IQ in the group was 145 — its findings do lend credibility to retrospective assessments of unusual precocity in case studies of the intellectually gifted.

Developmental advancement in gifted children

If only we could take those teachers who genuinely believe that precocious intellectual and social development are merely a function of parenting and environment, and endow them, magically, with retrospective vision so that they could observe their highly gifted young students' often startling precocity from the first years, or months, of life! Even in early childhood many gifted children display significant and often quite striking differences from normal developmental patterns. The early development of speech, movement and reading are extremely powerful indicators of possible giftedness. Of course, not every child who speaks, walks or reads early is even moderately gifted (Jackson, 1992), but when these skills appear at unusually early ages, and particularly when they appear in tandem, they are generally linked to unusually advanced intellectual development.

Early development of speech

The average age at which children can be expected to utter their first 'meaningful' word (other than mamma-dadda 'babble') is around 12 months. By contrast, gifted children begin to speak, on average, some two months earlier. In addition, they pass through the stages of speech acquisition earlier and faster than children of average ability. By 18 months the average child has a vocabulary of 3 -50 words, but little attempt is made to link them into short phrases until the age of two; however, in gifted children, linking words into phrases can commence as early as 12 months. By age four there is a significant difference in the length of sentences spoken by average ability and gifted children, with gifted children producing sentences more than twice as long as their age-peers. (This body of research is discussed in full in Gross, 2004.)

The child in pre-school or kindergarten who 'talks like a book' and won't stop may well be a gifted child!

Studies of highly gifted children record instances of linguistic precocity far beyond even that of the moderately gifted. The average age at which Gross's exceptionally and profoundly gifted children spoke their first word was just under nine months! Eleven of these children spoke their first meaningful word by the age of six months.

The speech of some highly gifted children demonstrates quite remarkable fluency and complexity. Adam Murphy, one of Gross's subjects, uttered his first word at five months and by two months later was talking in three- and four-word sentences. His mother recalls the astonishment of supermarket assistants as Adam, aged seven months, gave a running commentary on the grocery items as she wheeled him past the shelves in the shopping trolley. Peter, whose first word, spoken at eight months, was 'pussycat', surprised his parents at 18 months by announcing, 'I think I'll have a quick shower.' Wendy Roedell and her colleagues reported a 2-year-old who regularly used such complex sentences as 'I'm trying to figure out where I left my dancing shoes' and 'I want to take a look at this story to see what kinds of boys and girls it has in it' (Roedell, Jackson & Robinson, 1980).

Occasionally the speech of highly gifted children may be delayed, as in the case of Jonathon and Christopher, two brothers in Gross's study who did not speak until 18 months and 21 months respectively and whose mother was warned by their pediatrician that this might be indicative of intellectual disability. (Jonathan later tested at IQ 170 and Christopher at IQ 200!) In these situations, however, when speech does appear, it often arrives in the form of phrases or short sentences, rather than words in isolation. Robinson (1987) reports a young boy whose first utterance, at 20 months, was 'Look! Squirrel eating birds' food!'

Early development of mobility

Just as gifted children generally demonstrate an unusually rapid progression through the stages of speech development, the development of mobility also tends to arrive early and to progress with unusual speed.

The age at which children walk when led or supported by an adult may be several months earlier than the age at which they are able to walk by themselves. The average age for walking while supported, in the general population, is reported as 11 months, and the average age of walking unassisted as 14-15 months (Vaivre-Douret & Burnod, 2001). Studies of the early movement of gifted children generally report that they pass through the stages of walking on average, 2-3 months earlier than their age-peers. Some remarkable examples of early movement have been reported in children who later tested as highly gifted. Linda Silverman (1989) describes a girl of seven months who stood alone, climbed into chairs unassisted and went up and down stairs by herself. Gross (2004) describes Rick, of IQ 162, who was sitting up by himself at four months, running at 11 months and riding a two-wheeled bicycle unaided at age three. The average age at which Gross's subjects of IQ 160+ sat up unsupported was 6.1 months, as opposed to 7-8 months in the general population and the average age at which they were walking independently was 12.1 months — fully three months earlier than is usual.

It is not surprising that the ages at which their children walked and talked tends to stay in the minds of parents of gifted children. Early mobility means an earlier age at which children can walk into trouble. Early speech means that the 'Why? Why? Why?' stage comes earlier too! Gifted children are not an unmixed blessing to their parents.

Early development of reading

Research on intellectual giftedness suggests that one of the most powerful indicators of giftedness is early reading. Terman (1926) reported that the children in his longitudinal studies started to read significantly earlier than children in the control group.

Studies undertaken in the last 30 years, when print has become much more easily accessible to young children through television and the other advertising media, show an even greater incidence of reading among gifted children in the early years. VanTassel-Baska (1983) reported on 270 13- and 14-year-olds who had achieved high scores in either maths or English in the Mid-West Talent Search. VanTassel-Baska found that fully 80% of this group was reading by age five and 55% were reading by age four. More than 90% of Gross's subjects of IQ 160+ were reading before their fifth birthday.

Research has found that children who demonstrate a precocious development of speech and movement are highly likely to develop reading skills substantially earlier than their age-peers. The research literature on the highly gifted contains a wealth of information on extremely gifted children who learned to read either with no assistance or with minimal assistance from their parents.

There are two notable outcomes of the remarkable precocity in speech, movement and reading among gifted children.

Firstly, their early mobility allows gifted children to move around independently and explore for themselves quite a bit earlier than their age-peers of average ability, while their very early speech enables them to express their ideas, seek information and interact verbally with their parents and family members at an age when many children are only beginning to experiment with oral communication. Both early movement and early speech contribute significantly to these children's capacity to acquire and process information, while their early reading gives them access to an information bank not usually accessible to children until several years after school entry.

Secondly, gifted children's difference from their age-peers may be identifiable from an early age, not only to their parents but to neighbours and other members of the community. It is difficult either to ignore or to conceal a pre-schooler such as Andrew, in Gross's study, who had developed a passion for number and would gleefully inform strangers waiting in line for a bus that they had, between them, 37 buttons on their clothes! Community attitudes towards Andrew's intellectual precocity varied significantly. Some people in the line would respond with amused chuckles, or engage him in conversation; others would frown or ostentatiously turn their backs on this small poppy who was growing too tall, too quickly.

Key points from studies of early development

Longitudinal studies such as the Fullerton Study and the studies of Terman, Gross and others have a number of common key findings.

- Parents are excellent judges of giftedness in their pre-schoolers. Contrary to common belief, they do not, in general, exaggerate their children's abilities and their memories of the children's early development are generally accurate.
- In the early years, children who are intellectually gifted tend to be advanced in all areas of development.
- Gifted children and age peers of average ability display different levels of ability in speech, movement and reading in the early years and these differences are strongly predictive of intellectual ability.
- The intellectual and academic superiority of gifted students lasts from infancy right through adolescence and into adult life. Gifted children's love of learning may be dimmed by schools which withhold appropriate educational provisions but the **capacity** to learn does not 'burn out'.

Characteristics of giftedness in areas other than academic

(Guest author: Professor Karen Rogers, Director of Research, GERRIC)

In Extension Module 1, we introduced Professor Karen Rogers' synthesis of the research on the learning characteristics of intellectually gifted students. This section explores the research on characteristics of students gifted in creativity, leadership, and the visual and performing arts.

Characteristics of giftedness in creativity

This form of giftedness is most often identified using a test of creative thinking, which will measure such skills as **fluency** (the generation of many answers in short order), **flexibility** (the generation of many perspectives or new directions in short order), **elaboration** (improvement of an idea through details, embellishments, and extension), and **originality** (production of an unique thought, idea or solution). In general, the score differentials between gifted and regular test takers have centred on fluency, ideational fluency, flexibility, elaboration, and/or originality, rather than on the total test battery composite score. For the 43 studies on differentiating characteristics of this form of giftedness, the distinguishing cognitive and learning characteristics include:

- **Scanning**: Defined as the capacity for 'taking in' the whole of a setting, situation, or task and then reducing it to a manageable part that can be changed or manipulated. Described first by Sternberg (1985) as 'selective encoding', it involves discrimination in taking in the relevant characteristics of the situation. For the creative poet this might mean looking across all the words and phrases he or she has jotted down until a new word or line seems 'right'. For the creative inventor, this might mean forming in his or her mind a rough or incomplete mental 'sketch' of a possible invention. This scanning is the first step toward the fashioning of a creative solution, product, or performance. Getzels and Csikszentmihalyi (1976) named this capacity 'problem finding' — that is, knowing a good problem when one sees it and having the vision that is needed to select the 'important' element or essence of a problem. This scanning ability is a qualitative difference between regular learners and creatively gifted learners, although some difference in degree is found when comparing creatively gifted and intellectually gifted learners.

- **Internal locus of control**: Defined as the attribution of one's success or failure to one's own ability (or lack of it) or to one's own effort (or lack of it). Since 1950 and the groundbreaking work of J.P. Guilford, researchers such as Amabile (1983) and Schaefer and Anastasi (1968), for example, have pointed out the tendencies of creative individuals to display strong self-acceptance and positive self-evaluation behaviour, which, in turn, lead them to look **within themselves** for the reasons why they have done well or not so well on a task or problem presented to them. With this internal locus, then, they pursue a problem and its solution with a single-mindedness and persistence despite difficulties. Most researchers in this area suggest that this attribution found in the creatively gifted is essentially a difference in degree rather than a difference in kind.

- **Flexibility in approach to learning and production**: First studied in adult scientists and later in creative children, this capacity has been defined by Hennessey and Amabile (1988) as the ability to find a creative solution or to go on working towards one, viewing the situation or setting with little or no acknowledgement of its constraints. Simonton (1995, p. 470) describes this flexibility in creatively gifted individuals as '… making their senses more open to the influx of fortuitous events in the outside world'. Torrance (1966) found that this ability to overcome or fail to 'see' difficulties on the way to solutions was strongly associated with a child's locus of control and self-esteem. What characterised the behaviour of these children was a willingness to change the so-called constraints, or change their own perspective of the situation as they worked toward an unusual solution on his Unusual Uses, Circles, and Draw a Person sub-tests, which ultimately formed parts of the Torrance Tests of Creative Thinking. Perhaps due to the means by which this characteristic is measured, this behaviour is probably more a difference in degree than in kind when comparisons are made with the regular population of learners in our schools.

- **Re-structuring of learning environment and learning**: According to Barron (1988), the restructuring of a situation, whether it be a creative child's desk — where it gets 're-placed' in his or her classroom as well as how it is internally 'organised' — or a task and its parameters, suggests that the creatively gifted individual incorporates six 'ingredients' in this restructuring: (1) recognising existing patterns; (2) making connections; (3) taking risks by making changes; (4) challenging 'obvious' assumptions; (5) taking advantage of chance; and (6) seeing in new ways. Although Barron first worked with MacKinnon in finding this true of creatively gifted adult scientists, architects, and writers, research since that time has found this behaviour to hold true in other creative occupations and with different developmental levels and ages. As with flexibility as a difference in behaviour among the creatively gifted, this difference seems to be a difference in degree rather than in kind.

- **Willingness to take cognitive, social and physical risks**: As this characteristic suggests, the creatively gifted child does not let the possibility of failure deter trying something new. Finke (1995, p. 273) has described this as 'manipulating the preinventive forms in playful ways', while Schooler, Fallshore, and Fiore (1995) term this 'playfulness'. One can watch a highly creative child undertake an art project, for example, quickly choosing materials and beginning to execute a design or product, only to start over with an entirely new set of materials and design ideas if or when the first process does not 'work out'. In observing such a behaviour, it is evident that the child does not worry about failure or making a mistake and has the confidence to try again should the outcome not meet his or her expectations. This trait in creatively gifted individuals seems to be a difference in degree rather than kind.

- **Tolerance for ambiguity**: Defined (Tetenbaum & Houtz, 1978; Urban, 1991, 1995) as a component of personality, this 'mind set' seems to allow the creative individual to pursue original solutions to a task under conditions that cannot predict outcomes of the person's effort. The creative child appears comfortable continuing to work on a problem or idea without actually being able to see whether he or she is on the 'right track' or 'making progress'. For the creatively gifted, this characteristic appears to be a difference in degree rather than in kind.

CASESTUDY

Jim is flamboyant in his dress, really into the 'grunge' scene currently, but fun to be around. His excitement when he thinks of an idea is contagious, as is his sense of humour. His school performance is patchy, to say the least. In classes where the teacher recognises and respects his fine, original mind, he outdoes himself in the quality and quantity of his work. But in classes where 'no exceptions are made,' where assignments are rigid and deadlines are enforced, Jim refuses to produce and does fail. This happens regularly as he acquires new teachers each year. One can almost predict in which classes Jim will do poorly by which teacher he is assigned. This does not seem to disturb him nor keep him from trying again to do something unique when he does attend to the conditions of the problem he is given to work on. He thrives on taking a chance to do something 'new and different', and if his solution does not work, he will pick himself up and try again another day.

As a result, Jim's general skill levels are poor and there is some question about whether he will qualify for regrouped classes for advanced instruction as he progresses toward high school. He has no specialised talent area at present, and for him to be able to fully use his high degree of originality, he must become knowledgeable in some area. According to David Feldman (1980) and David Perkins (1981), he must become an 'expert' in some area for his originality to bear fruit. Without that, his creativity will probably never be fully utilised.

There is little doubt that Jim will be happy in adulthood; he has the natural flexibility to rearrange events for his own comfort. However, it will be a loss for society if Jim's creativity is not channelled into finding solutions and reformulating the problems that we have been grappling with for years, such as cures for cancer, prevention of ecological destruction, replenishing our ozone layer in the stratosphere, or providing food for the underdeveloped nations of the world.

Characteristics of leadership/psychosocial giftedness

This form of giftedness is most often identified by a student's performance on a task or project that has involved others or by engagement in an organisation or activity involving cooperative work with others. The identifier is most often a sport coach, a teacher, a school administrator or counsellor who has noted unusual attention to detail, successful completion of a complicated task or project, extraordinary personal interactions, and effective control. The recognition is comparative, that is, how this child has performed or conducted him/herself compared to others in the same context. In some cases, self-report assessments of leadership characteristics are used, but in most cases, no instrumentation is involved in the identification process. The distinguishing cognitive and learning characteristics, supported by 14 research studies include:

- **Task analysis/global scanning**: Task analysis has been defined by Sternberg (1985) as deconstructing a defined problem into a series of steps, beginning with the end goal and working backwards to the initial state. Studies of gifted leaders have clarified the leader's capacity to understand a given task and to be able to break it down into its parts, again, beginning with the ultimate outcome and planning the steps that would need to precede that outcome. Global scanning involves the capacity to apprehend the whole of a situation or context in a single effort rather than putting all the 'bits' of the context together to make the whole. Research have found gifted leaders significantly more likely to conduct this scanning before task analysis ensues.

- **Cognitive, affective, and visual perspective-taking/high social cognition**: These abilities can be defined as capacities to assume the view point of another medium, be it an expressed idea (cognitive), an expressed feeling or emotion, or an image viewed from an unusual perspective. Guilford (1981) was able to confirm affective perspective taking, which he labelled 'cognition of behavioural content', through factor analysis of his 'Structure of the Intellect' model of intelligence. In later work he confirmed social cognition, labelled 'divergent production of behavioural content', which basically means being able to cope with the behaviour of other people. Keating (1978) was able to analyse the relationship between the ability to resolve social dilemmas and verbalise social insights, measures of social cognition as well as cognitive perspective-taking. The inferring of another's visual experience has been observed in gifted children as young as three years (Walker & Gollin, 1977) and improves greatly as the children grow. Abroms and Gollin (1986) argued that these three forms of perspective-taking allow the gifted leader to 'stand in another's shoes'.

- **Advanced moral reasoning**: Numerous studies have attempted to study the relationship between intelligence and advanced stages of moral reasoning using Kohlberg's model. The general research has been contradictory; however, studies by Karnes and Brown (1981) and Tan-Willman and Guttridge (1981) linked advanced moral reasoning with children showing high levels of social sensitivity to the attitudes and values of others in their environment. Karnes and Schwedel (1981) studied leadership in pre-school children, discovering a precocious awareness of the needs of others, an ability to influence others, and an assumption of responsibility beyond what is expected for their age.

- **Lack of school-related anxieties (test taking, impending deadlines, teacher issues)**: As the set of behaviours suggests, the child who is a gifted leader has high self-efficacy and confidence that he or she can succeed (Bandura, 1973). Sternberg, Conway, Ketron and Bernstein (1981) included these behaviours as part of their conception of social competence: the individual thinks before speaking and doing, does not make snap judgements, assesses the relevance of information to a problem at hand, is on time for appointments, adapts well in social situations, is warm and caring, and is open to new experiences, ideas, and values.
- **Personal magnetism**: This compilation of personal characteristics generally attracts others to listen to or follow the gifted leader. Jarecky (1959), for example, measured such characteristics with the Vineland Social Maturity Scale, concluding that adolescents who received high ratings on sociograms, and 'good' characteristics ratings by their teachers on checklists, and who scored positively on the Vineland instrument, showed leadership characteristics such as: (1) being accepted for their leadership qualities by the majority of people who knew them; (2) being often involved in a social venture in which they made constructive contributions; (3) being considered arbitrators or policy makers by peers; (4) being able to make lasting relationships with peers and adults; (5) stimulating positive and productive behaviours in their peers; (6) using a personal approach to social complexities, using humour and insight.
- **Communication precision/expression**: This capacity is defined as the ability to modify one's form and content of speech according to what he or she presumes the listener will understand. It has been witnessed in studies of pre-school though adolescent gifted leaders by Maratsos (1973) and Menig-Peterson (1975), among others.

CASESTUDY

Jaime has the uncommon knack of getting along with almost everyone. She seems to genuinely like everyone she meets and those feelings are almost instantly mutual. She is very perceptive in understanding other people's feelings and concerns; at times she has almost painful experiences when her empathy gets the best of her. Her parents tell of the time she cried and cried after seeing a documentary about the children starving in Ethiopia. She kept asking, 'Why can't I help them? What can I do?' She was five years old at the time.

In primary school, Jaime gets along well with teachers because she is so dependable. When teachers want group projects done for parents' night, they know that putting Jaime in charge of the project will result in a high quality, attractive project that every parent will perceive as a successful classroom experience. Jaime, of course, puts in loads of extra time getting the project complete, time she seems to genuinely enjoy despite the fact that others in her group may not doing their part.

Jaime is already well known in her school for her wide participation in competitions, sports, fundraising efforts, and all-school projects. She is always looking for new experiences, and before long she has gravitated into some kind of leadership role within that organisation. In the classroom, her ideas are looked up to by her classmates. She has the knack of relating almost any content to the human situation, or at least to everyday relevance.

There are problems for Jaime in school, however. It is easy for her enthusiasm for new experiences to spread her too thinly. Often this means that her extracurricular activities take up more time than her school work. So far she has been able to get along on her finely attuned intuitive sense, but as her course work becomes more difficult (especially as she gets closer to university), she is going to find that she has not acquired enough content or enough skills to let her get by with so little time for study and reflection. The Jaimes of the world keep their schools running smoothly, but life down the road may not be so smooth for them if we don't help them more concretely with what schools are supposed to be about, while they are still in school.

Characteristics of visual/performing arts talent

This form of extraordinary performance is most often identified by a child's specific performance in an arts area, such as drawing, painting, sculpture, dance, music performance, music composition, acting, creative writing, theatrical writing, graphic design, etc. For the 29 studies on differentiating characteristics of this form of giftedness, the definition of 'artistic talent' referred most often to students producing or performing in their art form anywhere from two to four years ahead of their current age. The distinguishing cognitive and learning characteristics include:

- **Broad, deep content/skill acquisition in a specific artistic area**: What the specific content and skills are in each arts area differs radically by art form. For music, this breadth and depth can encompass an understanding of the music the individual is either performing or composing. Both talents appear to be discrete and do not necessarily exist in the same individual (Barzun, 1965; Sessions, 1965). The skills one might identify for the talented musician include melody and pitch discrimination (Shuter, 1968), sensitivity to harmony (Shetler, 1985), musicality, or a sensitivity to musical meaning (Mursell, 1958). For the visual arts, the talent is most evident in an ability to draw well and early (Clark & Zimmerman, 1984) and aesthetic sensitivity, the knowledge of when a product or performance is done well, is finished, is balanced compositionally, etc (Winner, 1981). In dance, the skill appears to be an ability to discern, imitate, and remember kinesthetic patterns in detail (McKayle, 1966), and understanding of the semantic and emotional content of a dance (Duncan, 1927). In drama, the skills include the ability to discern and imitate speech patterns and gestural mannerisms (Gardner, 1973), comprehension of verbal material (Wolf, 1981), and the ability to remember and recreate emotions or emotional states (Stanislavski, 1948). Research suggests that these skills are differences in degree rather than kind.

- **Intense motivation to learn and concentration on learning in specific artistic area**: As this characteristic suggests, the artistically gifted child tends to almost seem obsessive in his or her pursuit of improved performance. There is a high level of perseverance from a very early age (Meier, 1966), and a willingness to spend long hours early on 'practising' or perfecting their art form (Bloom, 1985). There is often an emotional intensity (Pendarvis, Howley & Howley, 1996) that seems to keep gifted artists 'glued' to their art form. Much argument exists as to whether this characteristic or behaviour is a difference in kind or in degree.

- **Intense need to achieve (nAch) and to be recognised in the talent area**: Defined as a drive by Jung many decades ago, this need to feel competent, to feel in control of one's art form and to be recognised as 'good' in the art form has been described as a difference in degree when comparing gifted artists with regular non-artists. What it translates into is the willingness to persevere and practise the art form until self-recognised perfection is achieved. This recognition is often enhanced or shaped by the individual's arts teacher or tutor (Bloom, 1985), as the two set out 'benchmarks of progress' through exhibitions, performances, or competitions.

- **Self-monitoring of performance in all areas**: Again, most probably a difference in degree rather than kind, this cognitive ability can be defined as the capacity to judge one's own performance or current level of skill accurately and objectively (Sternberg, 1985). The acclaim or applause of others usually holds 'second fiddle' to their own assessment of performance or product (Rogers, 1986).

- **Memory**: Defined as the ability to recall or remember particular content, specific to a single arts domain — auditory for music and theatre, visual for arts, verbal and episodic for drama, and kinesthetic for dance. Hermelin and O'Connor (1980) suggested that musically gifted children are more accurate and quick at matching pairs of words, synonyms, and picture pairs than are intellectually gifted children, but both groups are significantly faster and more successful at these matching tasks than are regular learners. Rogers (1986) suggested that this perceptual, motor, and decision speed differential may be a result of artistically gifted individuals' extraordinary ability to 'decode' an alternative symbol system, whether that be reading music, learning movement patterns, executing art elements in two- or three-dimensional forms, or interpreting written words into body and voice expressions.

- **Preference for working independently or with a mentor in specific talent area**: This cognitive style preference, which includes the desire to be responsible for one's own learning, to be given unstructured learning tasks and assignments but within a structured learning environment, to work on projects and tasks individually, and to engage in independent study, has been researched consistently since the 1960s by administering learning styles inventories to large groups of gifted and regular learners and noting the strength of the differences in preference for independent learning (eg, Stewart, 1981; Dunn, Dunn & Price, 1981). Bloom (1985) also noted this difference in degree among gifted sculptors and pianists in his longitudinal study of talent development in the artistic, academic, and athletic domains.

Jeannie has always 'marched to a different drummer'. Life for this child has been filled with perfecting a wonderful ability for dancing. This has meant getting up at 5 am to practise for a couple of hours before getting ready for school, rushing to private dance lessons after school is over, and practising for a few more hours in the evening before going to bed. Those teachers who know how much time Jeannie spends practising are vocal in calling this 'unhealthy' and 'not normal.' Jeannie's parents have constantly heard teachers say to them in conferences that if only she would put into her school work what is put into dance, she would be a straight-A student. There is no question that Jeannie is probably very bright academically. There are flashes of this in class when there are competitions, especially with tasks such as telling if two things are alike in appearance or in meaning. She has an amazing eye for details.

Socially, Jeannie gets along fairly well. She has one or two close friends (who are usually involved in some kind of artistic endeavour), but beyond that does not seem overly concerned about acquiring a large group of acquaintances. Her usual topic of conversation has something to do with dance or some distantly related idea concerning dance. Most of the kids find this either boring or just don't understand why she finds that so interesting.

Psychologically, Jeannie is a committed individual. To outsiders, she appears almost obsessive or compulsive about the talent area. Long ago, she decided to further her talent and to become best at it, even if that meant being less than perfect elsewhere. Thus, performance in academic subjects is sporadic. Jeannie does projects and assignments only when time can be found which won't interfere with her dancing practices and lessons. But she has made her choices about what is important to her, and academics are on the losing end of that decision.

Schools are committed to educating every child, and teachers have assumed that every child wants to learn everything there is to learn. Having little motivation for academic learning is perceived as something wrong — either with the home or the child. It is difficult for the nurturing nature of a teacher to meet up with Jeannie, because this child has made unpopular decisions. We could argue that we should just let her be, but democratically we can't. Jeannie needs a thorough grounding in our culture. As E.D. Hirsch (1987) argued so persuasively in his book, ***Cultural literacy****, the schools must provide Jeannie with this literacy. As things now stand, she may not get this education.*

Questions for Reflection

- Which of the topics addressed in this Specialisation Module have you found most valuable? Why? In what ways has your thinking been changed or confirmed by what you have read?

- Can you think of a student in your present school or in a school where you have previously taught who, in retrospect, you think may have benefited from off-level testing? Is there a student in your present class who shares some similarities with that student?

- Longitudinal studies provide powerful evidence of the benefits of acceleration. To what extent does your school use acceleration with gifted and talented students? If your school has rarely or never accelerated a student what beliefs or attitudes among your colleagues may have led to this?

Resources

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GIFTED AND TALENTED EDUCATION

PROFESSIONAL DEVELOPMENT PACKAGE FOR TEACHERS

SPECIALISATION

Module 1

Secondary

Professor Miraca U.M. Gross

Australian Government
Department of Education, Science and Training

THE UNIVERSITY OF NEW SOUTH WALES

GERRIC
Gifted Education Research, Resource and Information Centre

Module 1

Other Issues in Understanding Giftedness

Welcome to Specialisation Module 1: Other Issues in Understanding Giftedness. In this Module you'll be introduced to Howard Gardner's controversial 'Multiple Intelligences' model and some of the arguments for and against it.

We will look at the long history of Talent Searches and describe three current Australian Talent Searches which may be able to assist some of your present students to develop their gifts into talents. Longitudinal studies are extremely valuable as they give us an insight into how gifted young people develop as adults and the impact, in later life, of special assistance — or no special assistance — at school, and we will analyse the findings of several of these.

Some of the characteristics of giftedness in early childhood will be explored further in terms of their usefulness as predictors of later achievement.

Finally, we'll explore some of the research on the learning characteristics of students gifted in creativity, leadership and the performing arts.

Professor Miraca U.M. Gross

Specialisation Module 1: Secondary

Other Issues in Understanding Giftedness

Contents

Outcomes

At the completion of this Specialisation Module you will be able to:

- assess the usefulness, for your classroom or school, of Gardner's 'Multiple Intelligences' model.
- evaluate the potential value, for students in your classroom or school, of participation in the Australian Sports Talent Search for students gifted in sport and athletics and the Australian Primary Talent Search (APTS) and Australian Secondary Schools Educational Talent Search (ASSETS) for academically gifted students.
- understand the effects in adulthood, as shown through longitudinal studies, of special school provisions for gifted children and adolescents.
- recognise some early childhood characteristics and behaviours which indicate probable intellectual giftedness.
- understand and respond to the learning styles and characteristics of students who are gifted in non-academic areas.

Part 1

Multiple intelligences — do they exist?

In Extension Module 1, we examined the origin and development of Joseph Renzulli's 'three-ring' model of giftedness. As discussed in that report, Renzulli built his model **not** on the characteristics of gifted children but on the characteristics and behaviours of successful 'creative/productive' adults, particularly the creative architects studied by MacKinnon in the 1950s and the astonishing collection of paradigm shifters in science, medicine, law, literature and other fields whose lives were studied by Sir Francis Galton in the 1860s — men such as Shakespeare, Michelangelo and Newton. Critics of Renzulli's model have pointed out that it is doubtful whether models of successful **adult** productivity — particularly extreme adult productivity — can be generalised to children and used to identify child potential.

Gardner's 'seven intelligences'

A similar problem exists with 'Multiple Intelligences'. In 1983, a neuropsychologist, Howard Gardner, published a book which came to arouse considerable interest — and considerable controversy — in the educational community. *Frames of mind: The theory of multiple intelligences* proposed that there exist 'seven separate and somewhat independent intelligences' rather than one central, generalised capacity to reason.

At first glance this is an attractive and encouraging theory. Surely, the more 'ways' of being intelligent we can identify, the more chance individual children have of being 'intelligent' in one way or another! Teachers want to think the best of their students and they want the best **for** their students. Parents, naturally, want the same for their children. And it is this very natural human wish that life should offer wider opportunities for young people to excel that has caused 'Multiple Intelligences' theory to be embraced with such enthusiasm — particularly in egalitarian Australia.

Nonetheless, there are many problems with 'Multiple Intelligences' theory. Firstly, like Renzulli's 'three-ring' model, it was not primarily derived from a study of children. Gardner derived his theory from a study of brain-damaged adults and his observations of the destruction or preservation of **separate** abilities depending on the area of the brain that had been damaged. For example, singing and speaking appeared to be separate functions of the brain which could be independently lost or spared. Similarly, language skills and spatial orientation appeared to be the function of different parts of the brain. The capacity to relate productively to other people seemed to be sited in yet another area.

During the same period in which Gardner was making these observations he was also working with children who were **not** brain damaged and he noted that, while some of these children seemed skilled in many areas, most seemed to demonstrate greater strengths in some areas than in others. An important maxim for researchers or developers of theory in education, psychology or indeed any other field is: 'Correlation is not causation.' We have to guard against assuming that two factors which seem to co-exist are necessarily causally linked. However, Gardner was influenced by what he perceived as links between the two groups he was studying:

> *'Both of the populations I was working with were clueing me into the same message: that the human mind is better thought of as a series of relatively separate faculties, with only loose and nonpredictable relations with one another, than as a single, all-purpose machine that performs steadily at a certain horsepower independent of content and context' (Gardner, 1999, p. 32).*

In *Frames of mind*, Gardner introduced his 'seven separate and somewhat independent' intelligences. The definitions provided below are taken from Gardner (1999) pp. 41-43.

Linguistic (verbal)
Gardner defines this as sensitivity to spoken and written language, the ability to learn languages and the capacity to use language to accomplish certain goals.

Logical-mathematical
The capacity to analyse problems logically, carry out mathematical operations and investigate issues scientifically.

Musical
This entails skill in the performance, composition and appreciation of musical patterns.

Bodily-kinesthetic
The potential of using one's whole body or parts of the body (eg the hand or the mouth) to solve problems or to fashion products.

Spatial
The potential to recognise and manipulate the patterns of wide space (those used, for instance, by navigators or pilots) as well as the patterns of more confined areas (such as those of importance to sculptors, surgeons, chess players, graphic artists, or architects).

Interpersonal
This denotes a person's capacity to understand the intentions, motivations and desires of other people and, consequently, to work effectively with them.

Intrapersonal
This involves the capacity to understand oneself, to have an effective working model of oneself — including one's own desires, fears and capacities — and to use such information effectively in regulating one's life.

Later Gardner added three additional 'intelligences'; naturalist, spiritual and existential. However, the majority of his writing has been on the original seven.

Gardner was frank and open in acknowledging that he had **no** scientific or empirical basis for his selection of what is, or is not, an 'intelligence': 'The selection (or rejection) of a candidate intelligence is more reminiscent of an artistic judgment than of a scientific assessment. Borrowing a concept from statistics one might think of the procedure as a kind of "subjective" factor analysis' (Gardner, 1993, p. 62).

Perhaps a better description of this procedure could be 'making an educated guess'! However, Gardner was by no means the first to develop a theory of loosely related 'intelligences'.

Thurstone's seven 'primary mental abilities'

Early in the 20th century, psychologist Charles Spearman proposed that there is a general, pervasive human ability, which he called *'g'* — general intelligence — which underpins virtually all human activity. This does not deny that *g* manifests itself differently in different fields of activity, or that different levels of *g* may be required for successful performance in different occupations; it does hold, however, that general intelligence — the capacity to reason — is at the core of all activities which involve the generation of knowledge and the processing of information (Carroll, 1993; Pyryt, 2000). It has usefully been described as 'a highly general information-processing capacity that facilitates reasoning, problem solving, decision making and other higher order thinking skills' (Gottfredson, 1997, p. 81).

In 1938 L.L. Thurstone challenged this widely accepted belief by proposing that there was no central, integrated capacity for reasoning but rather that intelligence comprised seven 'primary mental abilities'. Like Gardner four decades later, Thurstone emphasised that his seven abilities were independent of each other. Prominent among Thurstone's 'primary abilities' were mathematical aptitude, spatial ability, and verbal fluency and comprehension, which also appear in Gardner's 'seven intelligences'. Thurstone did not include 'personal intelligences' however, and he did not consider musical aptitude to be a 'separate' ability, perhaps because it is so closely linked to numerical reasoning and because, for the lyricist in song or operatic composition, it requires both musical and verbal facility.

However, Thurstone's theories came under stringent criticism from other psychologists and statisticians who re-analysed his data through the statistical procedure of factor analysis and reported that, when correctly analysed, correlations were found between several of Thurstone's abilities, suggesting an underlying general capacity to process and use information which permeated mathematical, verbal and spatial ability — Spearman's *g* had struck again!

Gardner's exemplars

As indicated earlier, Gardner's 'Multiple Intelligences' theory was derived originally from a study of adults who had suffered various forms of cerebral damage. For this reason, it's perhaps unsurprising that he uses adults as examples of the various 'intelligences'. What does seem a little strange, however, is that most of the examples he gives are highly gifted men and women; for example, Einstein for logical-mathematical intelligence, T.S. Eliot for linguistic and Stravinsky for musical. However, as Gardner later acknowledged (Gardner, 1999) many of the remarkable, creative-productive adults he proposed as examples of specific intelligences were actually

multi-talented and excelled in several domains. This seems to contradict the very theory he was proposing.

As with Renzulli, we must question whether Gardner's models of successful **adult** productivity — particularly extreme adult productivity — can be generalised to children and used to identify specific abilities in childhood.

'Multiple Intelligences' in Australia

> *'I believe that philosophically, morally, politically and educationally the approach must be that all children have gifts and talents which need to be identified, valued and fostered' (Colanero, 1985, p. 46)*

This quotation is taken from a paper which was originally presented in 1984, in Canberra, at the Australian National Workshop on Gifted and Talented Children from Populations with Special Needs. This conference had a laudable purpose — to highlight the point that gifted and talented children appear in every racial and ethnic group, among children with disabilities, in disadvantaged groups and in remote communities; to give the message, indeed, that wherever children are found we will find gifted children.

Unfortunately, this message was not widely accepted — largely because a view that was very prevalent in Australia during the 1980s was that every child had a gift or a talent. This concept was translated, in many schools, into the belief that since everyone was gifted there was no need to make special efforts to identify 'gifted' students, there was no need for special provisions for 'gifted' students (except where the gift lay in sports or music!) and there was no need for teachers to be trained in how to differentiate the curriculum for 'gifted' students since all were, by definition, gifted. Unfortunately, this confusion between the concept of gifts and and the concept of individual strengths, which we discussed in Core Module 1, was endorsed, and even fostered, in some state education systems. Several states which had provided modest funding for special programs for gifted students withdrew the funds and allowed the programs to lapse.

Gardner published *Frames of mind* in 1983 and over the next few years it was enthusiastically adopted in many Australian schools. Unfortunately in some cases the push towards its adoption was socio-politically motivated, rather than educationally driven or endorsed. Gardner's claim that abilities were separate and unrelated was politically 'highjacked' and re-interpreted as endorsing the view that all children have gifts and talents; all teachers had to do was find each child's 'intelligence'.

In 1988 Abraham Tannenbaum, speaking at a conference organised by the Gifted and Talented Children's Association of South Australia, humorously refuted Gardner's premise of separate 'intelligences':

> *'Unfortunately there are still some people who accept a pseudo-scientific belief that the human mind consists of many discrete abilities and that if you break down these independent abilities and keep on breaking them down, you will eventually reach a point where there are more special aptitudes than there are people walking on the face of the earth. And the logical conclusion and absurdity that arises from this belief is the idea that if there are more aptitudes around than people, then surely each human being must have a chance of possessing at least one superior aptitude. Sadly, however, this is not so. God was not a democrat when She distributed abilities' (Tannenbaum, 1988).*

Tannenbaum was affirming that human abilities are not discrete or only tenuously linked. For example, mathematical ability and musical ability are not two separate 'intelligences' as proposed by Gardner; they are aptitudes which teachers of maths and teachers of music happily acknowledge to be quite highly correlated. Similarly, what Gardner calls 'inter-personal intelligence' — the capacity to understand other people — is closely related to what he calls 'intra-personal intelligence' — the capacity to understand oneself — and indeed a strong relationship between the two is essential for mental health.

> Unfortunately, teachers who adhere too closely to the 'multiple intelligences' theory are reluctant to acknowledge that students who achieve highly in one area of academic work are likely to have the potential to achieve highly in other areas. **Rather than assuming that a specific academic ability exists in isolation, educators should look for unusually high potential in other subject areas.**

In his Adelaide presentation Abraham Tannenbaum noted that students attending elite schools for the musically gifted are generally seen to be academically able. He pointed out that students at New York's Juilliard School of Music are generally well above average in academic, as well as musical, studies. This is still so today. Musically gifted students are not permitted to enter the Cincinnati School for Creative and Performing Arts, which admits students at the age of 10, unless they show additional evidence of significant academic aptitude; they would require this to keep up with the standard of academic excellence set by the school's student body. Radford (1990) reported that the average IQ of students at the Yehudi Menuhin School of Music was 130. Fewer than three percent of people score at this level.

Janet, a Year 8 student in your school, is talented across a range of subject areas. Mr Sinclair, her home-room teacher, has her for maths and is very impressed by her ability. He is determined to foster Janet's talent as much as he can.

The school's Professional Development Day early in the year featured a consultant who spoke eloquently about Multiple Intelligences. The staff enjoyed it very much. It was a theory that seemed to recognise the specialness of every child. Mr Sinclair decided that Janet's intelligence was logical-mathematical.

Ms Somerville has Janet for English. The girl has a rich vocabulary and a real feel for the nuances of language. Ms Somerville decided that Janet's intelligence was verbal-linguistic.

Mrs Parsons has Janet for art. She has always known that Janet is strong in both spatial and bodily-kinaesthetic intelligence.

Mr Patil teaches music. Janet has a glorious singing voice and plays the piano extremely well. Patently, her intelligence is musical.

Each of her teachers sees different qualities in Janet — those which they are readiest to recognise! Unlike primary school teachers, secondary teachers do not often have the advantage of seeing a student's performance across a wide range of subjects. There is the risk that, if they accept MI theory unquestioningly, that they will adopt rather uni-dimensional perceptions of their students.

If you find that a student is gifted in your subject, talk to teachers who have her for other subjects. This may alert them to the fact that she has high ability in your field and they may look more closely at her performance in their classes. Of course they may already be aware that the student is gifted and you will be able to build up a broader picture of her areas of high ability.

Janet, a Year 8 student in your school, is talented across a range of subject areas. Mr Sinclair, her home-room teacher, has her for maths and is very impressed by her ability. He is determined to foster Janet's talent as much as he can.

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Principals and executive staff are often able to take a broader perspective as they may have interacted with students over a number of years and become more aware of the range of talents possessed by many gifted students.

Encourage your staff, if they observe one talent in a student, to look for others.

Howard Gardner in Australia

Gardner has been highly critical of educators who 'highjack' his philosophies for socio-political ends. 'Contrary to much that has been written, MI theory does not incorporate a position on tracking, gifted education, interdisciplinary curriculum, the schedule of the school day, the length of the school year, or other hot-button educational issues' (Gardner, 1999, p. 89).

Should schools attempt to identify and teach to students' individual 'intelligences'? Gardner's position seems to be ambivalent on this. He criticises other scholars who have attempted to devise tests to measure specific 'intelligences' on the grounds that such tests often confuse a child's interest in an intelligence with aptitude or skill in it. Indeed in 1999 he went even further, overtly criticising educators who attempt to identify and teach to the 'intelligences' he proposed 16 years earlier and even seeming to suggest that these 'intelligences' were hypothetical:

> *'I consider it a fool's errand to embrace the search for a "pure" intelligence, whether general intelligence, musical intelligence or interpersonal intelligence. I do not believe such alchemical cognitive essences actually exist; they are an outcome of our penchant for creating (and then attributing reality to) terminology rather than searching for determinable, measurable entities' (Gardner, 1999, p. 207).*

This seems to echo a comment from his first book, *Frames of mind* (Gardner, 1993, pp. 69-70):

> *'Sympathetic readers will be likely to think — and fall into the habit of saying — that here we behold the "linguistic intelligence", the "interpersonal intelligence" or the "spatial intelligence" at work, and that's that. But it's not. These intelligences are fictions — at most, useful fictions — for discussing processes and abilities that (like all of life) are continuous with each other. Nature brooks no sharp discontinuities of the sort proposed here. Our intelligences are being separately defined and described strictly in order to illuminate scientific issues and to tackle pressing practical problems. It is permissible to lapse into the sin of reifying so long as we remain aware that this is what we are doing. And so, as we turn our attention to the specific intelligences, I must repeat that they exist not as physically verifiable entities but only as potentially useful scientific constructs.'*

In his 1999 book Gardner specifically and scathingly criticised a group of Australian teachers who were attempting to teach 'multiple intelligences'. His main concern seemed to be that the teachers were employing not pure MI theory but 'a mishmash of practices with neither scientific foundation nor clinical warrant' (Gardner, 1999, p. 79). He complained that 'left-brain-and right-brain contrasts, sensory-based learning styles, neurolinguistic programming and MI approaches were commingled with dazzling promiscuity. Clearly, no one had separated out the curricular wheat from the extracurricular chaff' (p. 79). The curricular wheat, presumably, was MI theory.

Indeed, as this Module is being written, Gardner has again gone on record describing the use of multiple intelligences in Australian 'accelerative learning' programs as 'fatally flawed' (Slattery, 2005). **It is important to note that he is not referring to the practice of accelerating gifted students.**

Gardner criticises, with some justification, teachers who claim to be using 'multiple intelligences' but who are simply continuing practices they have used for years — but conveniently relabelling them:

> *'I once watched a series of videos about multiple intelligences in the schools. In one video after another I saw youngsters crawling across the floor with the superimposed legend "Bodily-Kinesthetic Intelligence". I said, "That is not bodily-kinesthetic intelligence; that is kids crawling across the floor. And I feel like crawling up the wall"' (Gardner, 1999, pp. 141-142).*

Practical advice from Gardner: Some 'don'ts'

Teachers who plan curriculum along the lines of 'multiple intelligences' may want to heed the following guidelines developed by Gardner. Perhaps we should particularly heed his warning that multiple intelligences are theory only and that this theory has not yet been scientifically validated. In particular, we should be aware that children who possess high ability in one domain of learning are **more likely than not** to possess high ability in at least some others. Within Gagné's framework, this could be expressed as: 'If a student shows **talent** in one subject, look out more closely for **hidden gifts** in other subjects!'

Gardner's guidelines

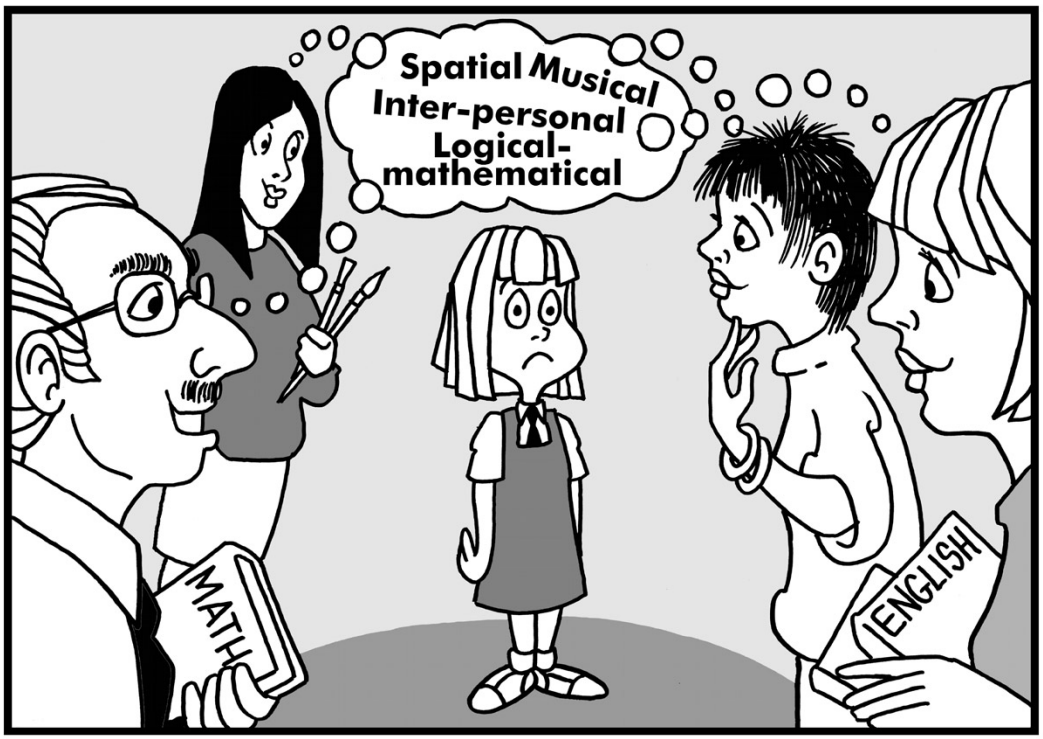
- Don't attempt to teach all concepts or subjects using all of the intelligences. 'Applying a scattershot approach to each topic is a waste of time and effort.'
- Don't believe that going through certain motions activates or exercises specific intelligences.
- Don't use intelligences primarily as memory devices. 'It may be easier to remember a list if one sings or dances to it. However these uses of the "materials" of an intelligence are essentially trivial.'
- Don't conflate intelligences with other desired outcomes. 'Interpersonal intelligence, the understanding of other people, is often distorted as a program for cooperative learning or as a playground for extraverts. Intrapersonal intelligence, the understanding of oneself, is often misused as a rationale for self-esteem programs or is attributed to introverts. These distortions and misapplications suggest a shallow (or nonexistent) understanding of my writings on intelligence.'
- Don't label people in terms of 'their' intelligence. 'People so labelled may then be seen as capable of working or learning only in certain ways, a characteristic that is almost never true.'

(Direct quotations in the above section are taken from Gardner, 1999, pp. 89-91).

Keep your eyes open!

Like the fabled blind men with the elephant, each of us tends to see the qualities in students which are closest to hand. Too often, we are blind to the richness of the whole child. There is the risk that, if we accept MI theory unquestioningly, without heeding Gardner's own warnings, we may adopt rather uni-dimensional perceptions of our students.

If you see one talent in a student, look for others!



Splitting infinities

Beware seductive theories.

Try not to be beguiled.

Our kids are individuals

no matter how they're styled.

A teacher's not infallible

and kids can get misfiled

if each sees what he values

and no one sees the child.

– Miraca Gross

The Principal's role in implementing a 'multiple intelligences' curriculum

If your school is working on a 'multiple intelligences' curriculum there are some issues that you may need to consider.

The first issue raised by Gardner in his list of things to avoid is extremely important. Trying to force-fit all 7 (or 8, 9 or 10) 'intelligences' to a topic in a curriculum unit is, as Gardner points out, a waste of time. Furthermore, this can destroy the integrity and rigour of some subjects. Attempting to develop 'bodily-kinaesthetic intelligence' in maths by getting children to form numbers with their bodies is not maths. Trying to foster 'linguistic intelligence' by creating science-related words out of the chemical table of elements is not chemistry.

Creating original and 'fun' activities for all is not the same as differentiating the curriculum for gifted students. MI curricula should be submitted to Passow's three 'key questions' just as stringently as we would submit any other curricula we intend to present to our gifted students.

Would all students want to be involved in these learning experiences?

Could all students participate in these learning experiences?

Should all students be expected to succeed in these learning experiences?

If the answer to any of these questions is **yes** the curriculum is **not** appropriately differentiated for your gifted students. It is not pitched at the level, pace and degree of abstraction that are needed by students who are gifted or talented in the subject area or areas in which the curriculum is set.

Unless MI curriculum is overlaid with challenging, higher-level tasks developed through the models of Bloom, Maker, Kaplan or Williams, it is unlikely that it will serve the needs of gifted students.

A number of schools are using Bloom/Gardner grids developed by commercial publishers. This can be a useful way of synthesising these two models. However, the ideas and activities presented still have to be submitted to Passow's 'trinity' of questions. The majority of commercial curriculum materials are developed to match the capabilities and needs of the majority of students — so these materials may not provide an optimal match with the needs of gifted students. You may want to use the ideas provided in commercially developed books or kits as 'foundation' ideas on to which your staff can build greater rigour and higher levels of abstraction.

Commercial materials may provide excellent 'horizontal enrichment' but may be much less suitable for **extension**. This will be discussed further in Specialisation Module 5.

Talent searches

'What is honoured in a country will be cultivated there.' (Plato)

National Talent Searches have existed for thousands of years. While the earliest talent searches were designed to secure the safety of a nation or empire, and assist in its administration or defence, modern talent searches are designed to identify young people who possess high levels of some aptitude or ability that their country or community values, and to assist them to develop these gifts into talents.

Chinese 'Public Service' talent searches

The oldest talent search that we know of was developed as early as the second century BC and was designed to identify highly able young people who could be trained to occupy positions of responsibility in the administrative bureaucracy that governed the vast Chinese empire. Several dialects of Chinese were spoken throughout the empire and people from different regions could not easily converse, so a strong emphasis was placed on literacy in the common **written** language which had been developed specifically for this purpose.

A three-tier selection process was set in place with applicants for positions in the Public Service passing through an increasingly rigorous series of tasks. By the 12th century AD, while linguistic mastery was still extremely important, administrators were also promoted on their knowledge of the geography of the empire, law, military affairs, agriculture and taxes, and their command of statescraft and administrative skills.

The Chinese emphasis on objective assessment under examination conditions which were designed to be scrupulously fair became an important element in the talent searches later developed by other nations and cultures. Examinations for entry to the introductory ranks of the Public Service were held in the chief city of each district and the questions and test conditions were designed to be identical. It is interesting to note how the principles of assessment developed in ancient China still influence modern testing procedures.

- While the Public Service Talent Search did not begin till the second century BC, China had used proficiency testing to determine hiring and promotion as early as 2200 BC.
- These tests assessed the specific skills which the applicant would require in the job for which he was being considered. For centuries before Confucius there were job-sample tests in music, archery, horsemanship, writing and arithmetic.
- Participants in the Public Service Talent Searches passed through a series of carefully graded, increasingly rigorous, tests.
- Testing sessions were systematically administered to ensure consistency.
- Examiners were specially trained in scoring techniques to ensure inter-rater reliability.
- Scrupulous attention was paid to anonymity in scoring.
- Tests were revised to suit changing times and changing needs.

While the Chinese empire greatly honoured its senior administrators, the Mandarins, they were regarded firstly as servants of the empire and the rigour and objectivity of the selection procedures were designed to ensure that the empire's administrators were chosen for their ability to provide outstanding service. This was highly unusual for its time: in many other cultures the top jobs went to family members of the monarch or emperor with little regard for their experience or ability!

The Ottoman empire talent search

From the 14th to the 16th century the huge Ottoman (Turkish) empire was governed by administrators selected deliberately from a talent pool of gifted and highly educated slaves who owed their lives, careers and good fortune to the Sultan and would be unlikely to rebel against him.

Each year, talent searchers were dispatched throughout the empire to seek young boys who showed high intellectual ability or physical prowess. These children were taken forcibly from their homes and were transported back to Constantinople. The children were assessed by an examining panel which asked them questions resembling those in modern IQ tests. The brightest of them were selected as student 'pages' and the very brightest were sent to the Palace School to be educated. The young people who had been selected on the basis of their physical prowess were trained as soldiers, with the strongest and most physically gifted being reserved for the elite corps of Janissaries.

The pages were not simply junior servants; they were empire administrators in training. The promotion system in the school was on merit, resembling that of the Turkish Government and also reminiscent of the Chinese Public service. The curriculum was broad, including oral and written fluency in Turkish, Arabic and Persian, these being the main languages of the empire. The young pages also studied law, philosophy, mathematics, science, theology and music. There was also constant physical exercise with special attention paid to horsemanship; the Sultans believed that a healthy mind functioned best in a healthy body. After a rigorous and carefully tailored education lasting approximately 14 years, many of the graduate pages were sent back to the country of their origin — still part of the vast empire — to govern their own former people on behalf of the Sultan.

The birth of modern talent searches

Modern talent searches have their origin in the vision of one remarkable man, Professor Julian Stanley of Johns Hopkins University in Baltimore, USA. In 1968 he encountered, by chance, a highly gifted 12-year-old boy with a remarkable gift for computing who was helping graduate students with Fortran. Stanley became aware that the boy also had an astonishing gift for mathematics, but age-appropriate tests were powerless to assess the full extent of his abilities (Colangelo, Assouline & Gross, 2004).

Stanley assessed the boy on the Scholastic Aptitude Tests (SAT) of maths and language used to assess 12th grade American students for college entrance — and despite being at least five years younger than the age-group the tests were designed for, he did exceptionally well. Stanley tried to intervene for the boy with several local high schools, to allow him to take accelerated programs in his talent areas, but all refused. The boy was socially and emotionally mature for his

age and the curriculum designed for his age-peers had little relevance for him; he had passed through most of the work years before. Eventually, with the support of Julian Stanley, he enrolled in undergraduate studies at Johns Hopkins where he graduated with both a BA and MA at age 17 — a striking example of successful radical acceleration.

Stanley became aware that there could be many such young people across the United States — perhaps not students who would be emotionally ready for college entrance but certainly students who could benefit from a more academically challenging curriculum in middle school and high school. In 1971 the Spencer Foundation gave him a generous financial grant to find and assist mathematically talented students who needed something more and different if they were to fulfil their potential. The modern Talent Search was born.

Today, many nations, including the USA, Canada, Australia, China, Singapore and Israel run academic talent searches. Talent searches offer a challenging test designed for older students to younger, bright, highly motivated students who already show unusual aptitude in a specific domain. Academic talent searches use aptitude tests rather than achievement tests; aptitude tests allow gifted students to use their reasoning abilities to solve problems even if the context is unfamiliar (Lupkowski-Shoplik, Benbow, Assouline & Brody, 2003).

Talent searches begin with a two-step process. The first stage is to identify students who have high ability in the field of the talent search and who would benefit from off-level assessment. This is usually based on their existing scores on an age-appropriate test — in general somewhere at or beyond the 95th percentile. The second stage is to assess these students on the off-level test which is generally designed for students three or more years older.

Typically, when students scoring in the top ranges of a test are assessed on an above-level test, a new 'bell curve' of scores appears with some of these gifted students scoring at the lower end of the new curve, some in the middle ranges, and some at the top end. **This does not mean that the students scoring below average on the above level test have 'failed' the test.** It is impossible to 'fail' a test of material one has not been taught. Indeed, a student's score on an off-level test should not be thought of as 'success' or 'failure' — **all** students sitting an off-level test have, by definition, already demonstrated high level aptitude on the age-appropriate test.

Scores on an off-level test can, however, assist teachers to discriminate between **different** levels of high ability. Jan, a gifted Year 5 student who scores at the 85th percentile on a test of maths designed for students in Year 8 has a higher level of maths aptitude than her classmate Steve who scores at the 30th percentile on that same off-level test — even though Steve is **still** gifted. Both Jan and Steve scored at the 95th percentile on the Year 5 test!

It would have been difficult for Jan and Steve's maths teacher to develop an appropriately differentiated maths curriculum for these two students on the basis of their on-level test scores — the on-level tests did not have sufficient discriminatory power. The off-level test, however, clearly shows that Jan's maths aptitude — and therefore her maths curriculum needs — are very different from Steve's.

Australian National Talent Search

Given Australia's passion for sport and athletics, and our justified admiration for, and desire to assist, young people talented in these areas, it is perhaps not surprising that our country's first talent search was, and still is, dedicated to identifying and fostering gifted young athletes and sportspersons. In 1994, as part of the lead-up to the 2000 Olympics, the Federal Government allocated $500,000 per year for two years to establish a talent identification program. The purpose of this program, which became known as Talent Search, was to identify athletic and sporting talent and to fast-track athletes for the Olympics. Eight sports — athletics, cycling, canoeing, swimming, rowing, triathlon, water polo and weightlifting — were chosen for inclusion and the target group for identification was gifted young people aged 14-16 years. This meant that the young athletes would be 20-22 years old in 2000. Talent Search coordinators were employed and based at each of the state academies or institutes of sport.

Talent Search had three phases:

> **School screening**. Equivalent to on-level testing in academic talent searches, this consisted of screening in the school environment using a battery of eight physical and psychological tests.
>
> **Sport-specific testing**. Students who scored in the top 2% on any of the eight tests were invited to participate in Phase 2 — off-level testing to assess for higher level talent in any one of the eight targeted sports. This phase equated, in some ways, to off-level testing in academic subjects.
>
> **Talented athlete program**. Students identified as having talent in a specific sport were invited to join a talented athlete program organised by a state or national organisation within their sport.

Funding and organisation arrangements have changed over the years and a much wider range of sports is now included but the program still follows the traditional talent search pattern of initial identification, off-level assessment and provision of appropriate training. Talent Search offers free talent identification to secondary schools and their students, and schools generally put forward, for this special assessment, students who are believed to have above-average potential. The age range is usually 11-18 although, as originally, most students tested are in the age 14-16 range. Those identified as having talent as a result of the special assessment are invited to develop their talent in either a quality sports program or a formal Talent Identification program.

> **Phase 1:** Tests are conducted by students' schools based on simple measures that would often be used to test student fitness. The students' results are then submitted to the local Talent Search Coordinator to be carefully scrutinised. Promising students are then invited to participate in Phase 2 testing.
>
> **Phase 2:** These tests may be somewhat similar to Phase 1 tests or they may be advanced sports-specific tests but they are conducted with more advanced scientific equipment, resulting in greater accuracy of results.
>
> **Phase 3:** Students whose tests have revealed favourable characteristics for a particular sport are invited to join a talented athlete program. Specialised coaching is provided to nurture the athlete and fast-track their development. The athlete is provided with an individualised program structured to the athlete's level of ability and level of development.

An important element in talent searches is that students are not exposed to off-level testing unless they have first **demonstrated** high aptitude on an on-level test.

Australia's sports and athletics Talent Search follows the classic talent search program; (1) identification through on-level testing; (2) confirmation and refinement of identification through off-level assessment; and (3) provision of advice on suitable avenues of talent development.

Where this talent search differs from most **academic** talent searches, however, lies in the fact that funding is also provided to directly **assist** the talented young person to develop his or her sporting or athletic talents, not only through individualised coaching and mentorship but also through ability grouping and acceleration — even through many Australian teachers still refuse to use the last two provisions with academically gifted students!

The website of the Australian Institute of Sport has a wealth of useful information on the Talent Identification program which provides outstanding opportunities for young Australians with special aptitude in sport and athletics to develop their gifts into talents.

Access http://www.ais.org.au/ and follow the links to Talent Search.

The Australian Primary Talent Search (APTS) and the Australian Secondary School Educational Talent Search (ASSETS)

APTS and ASSETS are not competitions. They are testing programs for academically gifted students, initiated by the Gifted Education Research, Resource and Information Centre (GERRIC) at the University of New South Wales, in association with the Belin-Blank International Center for Gifted Education and Talent Development at the University of Iowa.

APTS tests gifted students in Years 4-6. Since 1998 more than 12,000 academically gifted primary students in every state of Australia have participated in APTS. ASSETS tests gifted students in Years 7-9 (even in states where primary school continues into Year 7). ASSETS commenced in 2004. Over 2004 and 2005 almost 1,000 students from every state in Australia have participated in the program.

Like other talent searches, APTS and ASSETS employ off-level testing to assess the true levels of aptitude of students who have already been identified as having high ability. Identifying gifted students is critical; without appropriate academic challenge these young people may not fully develop their gifts into talents.

Professor Michael Pyryt has pointed out that a highly gifted Year 3 student who already knows and understands more, in maths, than the average Year 8 student, faces 50,000 minutes of potential boredom in Years 4-8 (50 minutes a day for 1,000 days) completing assignments on concepts he or she has already mastered! This student needs a significantly accelerated pace of instruction, opportunities to research topics in depth, opportunities to explore topics of interest and opportunities to interact with peers of similar ability. But this won't happen if this student's teacher is unaware of the full extent of his or her ability.

GERRIC sends, to parents of students who participate in APTS and ASSETS, two copies of the student's results on the off-level test. Parents are encouraged to give a copy to the student's school so that the child's teacher and school Principal can be aware of his or her scores on the subjects assessed by the test. Schools can then act on this important information.

Students who enter APTS take a test called EXPLORE. EXPLORE is a multiple-choice test developed by American College Testing (ACT) as a test for 8th grade students. The off-level test used in ASSETS is a special version of the ACT Assessment developed to assess Year 11 and 12 students in the United States for university entry. EXPLORE and the ACT Assessment measure academic aptitude in four subjects, English, maths, reading and science reasoning. The total time involved for APTS is approximately three hours, including testing and breaks. ASSETS takes half an hour longer.

Sample questions from EXPLORE and the ACT Assessment can be viewed on the GERRIC website (http://gerric.arts.unsw.edu.au). APTS and ASSETS testing is held once each year, generally in May, at a number of centres in each state and territory, including rural and remote centres. Testing is held on a Saturday morning but students whose religious faith precludes them from testing on a Saturday may be able to register for testing on the following Sunday at a smaller number of sites around Australia.

Who is recommended to participate in APTS and ASSETS?

Precise details of this can be found on the GERRIC website but broadly, APTS is open to students in Year 4-6 and ASSETS to any students in Years 7-9:

- who have scored in the 95th percentile on an individual or group IQ test (IQ 125+) or on an achievement test in any academic subject area,
- who have scored in the top band on any state's 'Basic Skills' test (LAP in Victoria),
- who have gained placement in certain types of gifted program (eg, Opportunity Class in NSW, PEAC program in WA),
- who have gained a Distinction or High Distinction in the Australian Schools Maths, Science or English Competitions,
- who have won an academic scholarship, or
- whose teachers believe them to be in the top 5% of academic ability for their age.

Please see the website for the precise entry criteria for which students must provide evidence.

How do students benefit from APTS or ASSETS?

- Taking EXPLORE or the ACT Assessment allows students to demonstrate unusual academic strengths in one or several key academic areas by taking an academically challenging test at a level that is not usually set at the Year levels in which they are enrolled. This information can be used by the student's school in planning appropriate curricular and programming modifications.
- Students gaining outstanding individual scores are acknowledged in a formal recognition ceremony at the University of New South Wales.
- Students scoring significantly above their Year level are eligible to participate in a range of GERRIC programs which have been developed specifically for high scoring APTS and ASSETS students.

How do families benefit from APTS or ASSETS?

- Families receive two copies of a comprehensive written report on the student's performance in the four subject areas. This includes recommendations for curriculum readiness. Families are encouraged to give the second copy to the student's school.
- Families are regularly informed of courses and programs for gifted students offered through GERRIC, including a range of student programs in school vacations, as well as courses and seminars regularly held for parents of gifted children.
- Families have the opportunity to participate in research to further assist gifted children.

The experience of participating in APTS or ASSETS offers many advantages to gifted students. For many, it is their first opportunity to test themselves against material that truly challenges them. The tests allow gifted students to stretch their mental muscles. It can be an affirming and indeed exhilarating experience. The experience also allows gifted students to develop better test-taking skills in a non-threatening atmosphere.

How do schools benefit from APTS or ASSETS?

These two nationwide talent searches provide objective identification of students talented in four key learning areas. Parents receive two copies of a comprehensive report which gives precise information on how the student compares with other Australian students taking the same test and also how he or she compares against the normative sample of students some years older. GERRIC encourages families to give the second copy to the student's school.

With the score reports comes a comprehensive analysis of the student's relative strengths and weaknesses across the four subject areas. Schools can use this to plan more closely individualised programs than would be possible without this sort of information. Increasingly, schools are using the practical information from APTS and ASSETS results to provide appropriate educational responses for their academically gifted students.

More than 50% of the gifted Year 4-6 students participating in APTS score above the average for Year 8 students! More than 50% of the gifted Year 7-9 students participating in ASSETS score above the average for Year 11-12 students! APTS and ASSETS reveal the wealth of talent — often hidden talent — in Australian schools.

Schools across Australia act as test sites for APTS and ASSETS. If your school would be interested in becoming a test site, or if you would like printed material about these Talent Searches which you could give to parents, email gerric@unsw.edu.au or fax (02) 9385 1973.

Lee-Wong, in Year 9, arrived from China only two years ago but his progress has been phenomenal. He topped his class in maths and science last year and the other students have stopped teasing him about his rather formal spoken English; they have grown to like and respect him. Mr Wallace, on the maths staff, has been rather unpleasant about his success, putting it down to assiduous attendance at coaching colleges, but Ms Brownlee, who has him for maths this year, insists that it is genuine talent. 'There's nothing mechanical about it,' she says. 'He has a real intuitive understanding. He predicts ahead.' 'He's the same in science,' says Mr Harris. 'He makes leaps of judgement and he's usually right. You can't "coach" for that!'

The maths and science faculties are beginning to look at providing some form of enrichment for Lee-Wong. However, not all the staff agree. 'He has to work on his English first,' says Mrs Houghton. 'Okay, his vocabulary has made a big improvement but he still misses out "the" and "a" all the time when he's writing and that's going to count against him in Year 12 exams.' Ms Brownlee and Mr Harris protest that this will stop over time and that it is just as important to foster Lee-Wong's strengths as it is to remediate his weaknesses.

The school wants to establish a profile of Lee-Wong's strengths and relative weaknesses. What are their options and what might they do as a result?

Ken, in his second year in your rural secondary school, is in Ms Lombardi's science class. She is impressed not just by his passion for the subject but by his deep and wide knowledge. She talks to Mr Hamilton who had Ken last year and he says Ken is one of the brightest students he has had for some years — even brighter than his cousin, Carla, who was dux of the school a few years ago.

Mrs Robinson, who is the Year Coordinator, comments that Ken is impressing the maths staff as well. She suggests that the school should take a closer look at the boy to get a better idea of his patterns of ability and perhaps develop some kind of special provision for him.

What might the school do to develop a profile of Ken and how might they respond to what they find?

p ROLE es ROLE u LOCALITY

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The maths and science faculties approached you at the start of the year about providing some form of enrichment for Lee-Wong. However, not all the staff agree. 'He has to work on his English first,' says Mrs Houghton. 'Okay, his vocabulary has made a big improvement but he still misses out "the" and "a" all the time when he's writing and that's going to count against him in Year 12 exams.' Ms Brownlee and Mr Harris protest that this will stop over time and that it is just as important to foster Lee-Wong's strengths as it is to remediate his weaknesses.

At a meeting of faculty heads it was proposed that the school should establish a profile of Lee-Wong's strengths and relative weaknesses so that an Individual Education Plan (IEP) could be developed. What are some of the school's options for this and what might be some of the outcomes?

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What might your school do to develop a profile of Ken and how might your staff respond to what they find?

The first thing the staff needs to do is make a more accurate assessment of Lee-Wong's levels of ability in science and maths — and probably some other subjects as well. Such high levels of achievement in two subject areas are a good predictor of high general ability. Perhaps it is Lee-Wong's lesser familiarity with English that is holding him back on some of the language-intensive subjects. Or is he really being held back? Are Mrs Houghton's expectations perhaps a little unrealistic given that he has been speaking English for only two years? How much English is spoken at home?

Off-level testing is certainly indicated. A useful starting place would be for Ms Brownlee to give Lee-Wong a standardised test of maths aptitude or achievement developed for students of his age — and for Mr Harris to do the same in science. This will give them objective evidence of where Lee-Wong stands in relation to his age-peers. If he scores in the top 10-15% this will indicate that there may be a ceiling effect for Lee-Wong on these particular tests, and that off-level testing would be advisable.

Lee-Wong could then be assessed on maths and science ability using standardised tests designed for older grades. If Ms Brownlee and Mr Harris wanted to make a less formal assessment first, they could ask one of their colleagues who teaches the senior Years to lend them teacher-made tests that they use with their own classes. Additionally, past exam papers developed for Year 10 or Year 12 statewide exams can make excellent off-level tests for gifted students in younger grades.

However, an off-level test that assesses ability in several subject areas would be an advantage. The school could talk to Lee-Wong about the possibility of him participating in the Australian Secondary Schools Educational Talent Search. There may well be other gifted students in Years 7-9 who could also benefit from ASSETS. As your school is in a city, your students would have the choice of several test sites. Maybe your own school could apply to be a site!

Lee-Wong's parents would receive a comprehensive report on his scores, not only in maths and science, which are the talent areas Ms Brownlee and Mr Harris have noticed, but also in English and reading comprehension. Either through the ASSETS testing or through off-level testing they would conduct in their own classrooms — or both! — Ms Brownlee and Mr Harris would now have a picture of how far beyond Year level Lee-Wong's achievement really is, and they can make a more informed decision about how to differentiate the curriculum to meet his learning needs. Additionally the school would have objective evidence of Lee-Wong's test performance in subjects which are language intensive, such as English and reading, and those which are less language intensive.

Perhaps Lee-Wong could be allowed subject acceleration for maths or science. Also, does the school ability group students in his talent areas and if so, is he appropriately placed? Modules 5 and 6 in this Professional Development Package provide practical information on a range of curriculum models and program models that your school could use to respond to the learning needs of Lee-Wong and your other gifted students.

As he lives in a city there are many other opportunities for Lee-Wong to access enjoyable and challenging activities. Each state has a gifted children's association and many of these provide weekend enrichment activities, as do some universities. Special interest clubs can provide excellent enrichment and access to other students with similar interests. If your school has a gifted education coordinator, she may well know of some of these clubs or enrichment activities — or she can find out.

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Part 2

Longitudinal studies: Gifted students growing up

Longitudinal studies are one of the rarest but most valuable forms of research. They are thin on the ground probably because they are so very time-consuming for the researcher! But we have learned a great deal from some of the better known studies which have followed gifted young people from their early childhood into adulthood. In particular we can look at some of the long-term effects of various interventions such as acceleration.

One of the earliest longitudinal studies of gifted children is also famous as being the longest longitudinal study **ever** conducted!

The Terman study

Lewis Terman, a psychologist based at Stanford University in California, conducted a monumental study which began in the early 1920s with 1,528 gifted children of IQ 135 and above. On his death in 1956 his colleagues continued with the study and it has passed through several generations of researchers. Today, in 2005, the study is still ongoing. The subjects who are still alive are in their nineties. Five books which provided major reports on the study were published between 1925 and 1995 and it has been the subject of numerous articles.

To find his subjects Terman canvassed schools across California. Initial nomination was by teachers. Terman asked teachers to nominate, to the study, the children in their classes whom they thought were the most intellectually able — and also the youngest child in the class. Acceleration was used much more commonly in the first quarter of the 20th century than it is today; academically talented students who were also socially and emotionally mature were often allowed to grade advance, therefore the youngest child in a class could well be a gifted child who had accelerated. Children who were nominated to the study were given individual intelligence tests using the then current version of the Stanford-Binet Intelligence Scale.

Terman and his colleagues collected an enormous amount of information about the children. Parents completed a lengthy questionnaire about the home. Teachers completed a somewhat shorter questionnaire about the children's schoolwork. The children were given a medical examination and their height, weight and other physical characteristics were recorded. The children completed a questionnaire about their hobbies and personal interests and also a record of books they had read during the preceding two months. They also completed a questionnaire about their play interests and took a set of seven personality inventories which assessed emotional stability and aspects of social and emotional development. Importantly, similar data were collected on randomly selected children of similar ages so that Terman could compare the gifted sample with a control group of age-peers.

An unfortunate perception of gifted children, which was extremely strong in Terman's time and which lingers even today, is that intellectually gifted students are weedy, undersized weaklings. Terman's findings came as a profound shock to those who wanted to believe that nature compensates for giving some individuals superior intelligence by bestowing on them inferior bodies. The gifted children tended to be taller, stronger, more physically robust and less prone to childhood ailments or accidents than were the comparison group children. They also reached puberty earlier. Subsequent studies (eg, Hollingworth, 1942; Gross, 2004; Gottfried, Gottfried, Bathurst & Guerin, 1994) have shown similar findings.

One of the most persistent myths about the Terman study is that the children came from middle-class families. Certainly some did but many did not. However, they were bright young people whose families tended to value education. Because of this, a greater proportion of the Terman subjects went on to tertiary study than was common for their generation. They entered occupations that paid well and, through upward mobility, they **became** middle class and their children were brought up in a middle class lifestyle. It is important to note this because some of the early critics of Terman's study attributed the physical superiority and better health of the Terman subjects to social advantage. However, Florence Goodenough, one of Terman's research assistants, believed that it was due to a generally higher standard of diet and medical care in their homes. Additionally, as Australian researcher Louise Porter has recently pointed out (Porter, 2005), gifted children tend to have fewer childhood accidents because they tend to think more about what they are doing!

Terman's group and education

Almost half of Terman's subjects could read before school entry and on standardised tests of academic achievement they consistently scored, on average, 40% ahead of their age-peers as they progressed through school. Twenty per cent were permitted to skip all or part of first grade and by the time they graduated from high school 10% had skipped two grades and a further 23% had skipped one (Terman & Oden, 1947). In high school, despite so many of them being younger than their classmates, they consistently scored in the top 10% of their classes in achievement. They enjoyed school — many of them, in middle age, spoke reminiscently about the support and encouragement they had received both from their families and from their teachers — and many more went on to college than was customary at that time. Indeed, around 65% of the men and almost 60% of the women went on to take further degrees. Laycock (1979) points out how remarkable this is because most were undertaking tertiary studies during the economic depression of the 1930s when the proportion of women graduating from college was very much smaller.

While Terman was proud of the academic achievements of his subjects, and happy for them, he was concerned that so many of these academically brilliant young people (more than 10% of the men and more than 15% of the women) did not attend college and 30% of those who did, did not graduate. However, again we must remember that the 1930s was a difficult time, financially, for many people. Terman noted that parental inability to fund college attendance was a significant hindrance for substantial numbers of those who did not attend or graduate.

An interesting finding of the study is that students who had accelerated in primary or secondary school were more likely to enter postgraduate study than equally gifted students who had not, and they were also more likely to complete postgraduate study successfully. A survey undertaken in 1977, when the average age of the group was 67, asked them to look back on their

lives and rate the satisfaction they had found in various areas. The responses of people who had been accelerated were generally more positive than those of people who had not. Accelerands reported significantly greater satisfaction in their work, in recreational activities, and, interestingly, in social activities and friendships, than did non-accelerands (Cronbach, 1996).

Terman and his colleagues concluded that, in general, academically gifted students of IQ 140 or above 'should be promoted sufficiently to permit college entrance by the age of 17 at latest and that a majority in this group would be better off to enter at 16' (Terman & Oden, 1959, p. 72). Certainly, as we will discuss later, for exceptionally gifted children this seems to be pretty sound advice.

Terman's group and careers

As with education, the careers of the Terman group reflect the era in which the study was set. By the time of the 1957 survey more than half the women were housewives with no steady outside employment. Of those who did have jobs, the largest group was in teaching and the next largest in business, as secretarial or administrative assistants. The women who did have professional careers tended to do extremely well; there were women with distinguished careers in science, art, education, writing and business. In 1954 Terman recorded the accomplishments of his group, showing that by age 40 they had written 67 books, more than 1,400 articles in professional or research journals and more than 400 short stories or plays. He pointed out that this was 10 to 30 times as large as could be expected for 800 randomly chosen people of the same age (Terman, 1954).

In the middle and later years of the study, Terman's research team compared men who were rated as 'most successful' and 'least successful' in their careers. One of the strongest findings was that the 'most successful' group had, as children, parents who themselves had significantly higher education than was was usual for the time, and who passed on a strong valuing of education to their children, while the families of the 'least successful' group had much less encouragement and valued education less. Another strong but unsurprising difference is that the 'most successful' had a much stronger drive to achieve than did the least successful group. There is no evidence, however, that these groups were distinguishable, in childhood, in terms of motivation.

Interests of the Terman group

In childhood, the Terman group showed many of the characteristics of gifted children which we have already discussed in previous Modules. Reading was consistently a favourite occupation in childhood: Terman's assessment of the children's reading abilities and interests showed that, at age 7, the average child in the group read more books than the average 15 year old! In addition, the books they read were more like those enjoyed by older children or adolescents. This love of reading continued into the adult years.

The games Terman's subjects loved as children tended to be more like those enjoyed by children several years older. A characteristic which Terman's team noted which has also been noted in later studies (eg, Hollingworth, 1942; Gross, 2004) was a propensity to want to change the rules of games to make them more interesting or challenging. This can be misinterpreted and resented by other children who assume that the gifted child is cheating!

The most recent report of the study has re-emphasised the degree to which the higher intellectual ability of the Terman children influenced so many aspects of their development as young people:

> *'Throughout the school years and into adolescence these children's interests, attitudes and knowledge developed in correspondence with their mental age rather than with their chronological age. Their academic achievement as measured by tests, their interest and liking for various future occupational careers, their knowledge about and interest in games, their choice of recreational reading materials, and their moral judgments about hypothetical conduct were all characteristic of older non-gifted children whose mental age-range was approximated by this much younger and brighter group. Even the intellectual level of their collections was more mature than that of their chronological age-mates' (Holahan & Sears, 1995, p. 16).*

We noted, in Extension Module 3, the propensity of parents of gifted students to become involved with community organisations — often charities which support children with special needs or families in difficulties — to which they give voluntary service, often over many years and often as unpaid administrators. Terman reported this in the earliest volumes of his study, as being a characteristics of the parents of his gifted group, and his research team described how, as the gifted group grew up, many of them continued this 'tradition' of service. 'Their roles as volunteers often included responsibility and influence comparable to those of many paid occupations' (Holahan & Sears, 1995, p. 97).

Contributions of the Terman study

The Terman study demolished many myths about gifted and talented students which had affected community attitudes towards these young people. In the first quarter of the 20th century, and for many years before, people had associated high intellectual ability in children with physical and even emotional weakness — the skinny, bespectacled 'nerd' who shuns exercise and outdoor activities and who is prone to accidents and childhood ailments. There was even a belief in 'early ripen, early rot' — the idea that academic brilliance in childhood would lead to 'burn-out' in adolescence. Terman showed that the physical and emotional health of gifted children tended to be superior to that of age-peers and that, with family and school support, high abilities were translated into high achievements and lifetime productivity. The study also demonstrated that acceleration caused no social or academic difficulties; indeed, by contrast, gifted students who were accelerated experienced greater school and college success, and reported greater satisfaction with many aspects of their lives, even in middle age and after, than did equally gifted students who were not permitted to accelerate.

The Study of Mathematically Precocious Youth (SMPY)

The best known, and most extensive longitudinal study of modern times is the Study of Mathematically Precocious Youth which was initiated by Professor Julian Stanley as an important element of his Talent Search which we reported earlier in this Module.

In Australia we tend to use the term 'precocious' in a derogatory sense to describe a child who behaves in an ostentatious manner — a show-off or 'smartypants'. What the term really denotes, however, is unusually early development. SMPY is a study of students who are unusually gifted in maths and are capable of performing at levels well beyond what would be expected for their age.

Stanley and his associates, principally Professors Camilla Benbow and David Lubinski of Vanderbilt University, are in the fourth decade of a planned 50-year study of 5,000 mathematically or verbally gifted adults who scored, as adolescents, on the Maths or Verbal scales of the Scholastic Aptitude Tests, at a level that would place them in the top 1% of the population.

The study has some interesting findings.

- Mathematically and verbally gifted children use problem solving strategies that do not seem to develop in children of average ability until some years later. It is not only that they are talented in maths or language; it is that they seem to engage with, and manipulate, maths or language in ways that are more characteristic of students several years older.
- They tend to possess an internal locus of control, accepting that they themselves are largely responsible for their academic successes or difficulties. They are less likely than their age-peers to attribute difficulties to external factors ('My teacher can't explain new concepts like Mr Jackson did last year; that's why I'm not doing so well at the moment') and, while in general they don't become conceited about their abilities, they are more likely to accept that they have unusual maths or verbal talents.
- Gifted students tend to be underserved both in primary and secondary school. Underachievement is imposed on many of them by an undemanding curriculum developed for students of average academic ability but quite unsuited in content, level and pace for students with specific maths or verbal talent.
- They tend to be well adjusted and have positive attitudes towards school. However, highly gifted students tend to experience more social difficulties at school, particularly in the case of verbally gifted girls who are often mocked for their mature and articulate speech. Mary Ann Swiatek found that verbally gifted students were more likely to conceal, or partly conceal, their abilities for peer acceptance than are mathematically gifted students (Swiatek, 1995). Gross (2004) suggested that this may be because a student with remarkable maths ability may feel the need to 'dumb down' mainly in maths classes, whereas a student whose vocabulary and modes of speech set her apart from age-peers may feel the need to be 'on guard' much more of the time.

- Talent Search participants tend to retain, and use, their high abilities. An investigation of one cohort of Talent Search participants when they were in their early 30s found that 90% of them had Bachelor's degrees while fully 25% held doctoral degrees (as against 1% of the American population having doctorates) (Benbow, Lubinski, Shea, & Eftekhari-Sanjani, 2000). Men and women in the study had equal educational attainments. As with the Terman study, the picture for these young people in adulthood is very far from the stereotyped 'early ripen, early rot' predictions.
- The highest achievers in the Talent Searches tend to maintain their superiority in adult life. In the late 1990s Lubinski, Webb, Morelock and Benbow (2001) surveyed Talent Search students from the early 1980s who had scored, on the SAT, at levels achieved by fewer than 1 in 10,000 in the population. More than 50% of these young people were already pursuing doctorates. Even though they were only in their 20s, many had published several articles or secured patents for their inventions. A sizeable number had already won prestigious awards in their fields.
- However, Talent Searches have also identified that achievement and success are by no means built in for gifted students. Where schools have not provided structured opportunities for talent development, these students perform, in school, and in later life, at levels significantly below their true capacity. As the Gagné model illustrated in Core Module 1, a facilitative school environment is required to promote the translation of high ability into high achievement. Gifts, no matter how profound, do not develop into talents unless the school accepts its responsibility to actively facilitate this process. Talent searches have noted significant differences, sometimes quite startling differences, in the adult achievements of equally gifted students whose schools have or have not provided special opportunities.

One intervention has proved effective beyond any other for Talent Search participants:

> 'Although the sheer number of studies on the short-term and long-term effects of the variety of accelerative experiences that are promoted by the various Talent Search programs is voluminous (Benbow & Stanley, 1996), the results can be summarised rather succinctly. When differences are found, they favor the accelerants over nonaccelerants irrespective of the mode of acceleration. And, Terman's data indicated this is true even 50 years after the acceleration occurred' (Cronbach, 1996).

The long-term effects of acceleration will be discussed briefly in the next section and in Specialisation Module 6. We also recommend that you access Professor David Lubinski's chapter in Volume 2 of *A nation deceived: How schools hold back America's brightest students*. This major gifted education report, published in September 2004, can be accessed and downloaded cost-free from its website: http://nationdeceived.org

An Australian longitudinal study

A study commenced in 1983 by Australian researcher Miraca Gross has followed the intellectual, academic, social and emotional development of 60 exceptionally and profoundly gifted young Australians who in childhood scored IQ 160 or above on the Stanford-Binet L-M when that version of the Stanford-Binet Intelligence Scale was still current (Gross, 1993). Children scoring at this level appear in the population at a ratio of 1:10,000 or fewer, and their academic and socio-affective development, and their educational and social needs, can differ radically from those of their age-peers. The majority of the young people are now in their mid-20s.

Influenced by the studies of Terman and Hollingworth, Gross collected a wealth of information about her subjects' academic development. At intervals during their primary and secondary school years, the children were given standardised tests of achievement in several academic subject areas. As in almost every case they 'ceilinged out' on age-appropriate tests, off-level testing was used to get a clearer understanding of the full extent of their abilities. Their tested levels of achievement were then compared with the levels of work they were permitted to undertake in class. This enabled Gross to judge the degree of 'fit' between the children's demonstrated achievement and the programs provided for them by their schools. In addition the children's school reports were examined to analyse their teachers' perceptions of their levels of ability and achievement.

In the 1980s and early 1990s Australian teachers were even less willing than they are now to employ standardised tests of aptitude and achievement. A lot of 'educated guessing' went on. The teacher of 7-year-old Jade wrote in her end-of-year report, that Jade's spelling was 'at grade level'; in fact, Jade's spelling age on the South Australian Spelling Test, which she was given as part of the study, was 9. Adam's Year 3 report stated that he 'could record addition and subtraction up to 20'; Adam had been performing at this level in his first year of school. Anastasia's Year 3 report read: 'She is to be commended in reaching the Year 2 and Year 3 objectives in mathematics'; Anastasia had actually scored at a 10-year-old level on a standardised test of maths.

This failure to use objective assessment led, in many cases, to teachers making serious underestimations of the children's abilities and, as a result, to some astonishing mismatches between student readiness and curriculum provision.

CASESTUDY

In general, secondary school teachers know very little about the early childhood and primary school years of the students they teach. Unfortunately, the records passed on from primary schools may not detail difficulties experienced by some children which are the fault of the primary school, rather than the child!

The problems experienced by Ian Baker started in the first weeks of primary school.

Ian is a remarkably gifted young man. He taught himself to read at an early age. By three he was reading small books and at preschool he enjoyed helping the teacher by reading aloud to the rest of the class while she prepared for the next lesson. By the time Ian entered school he was reading, with keen pleasure and full comprehension, E.B.

White's ***Charlotte's web****.*

Difficulties arose in the first few weeks of primary. Although his mother had mentioned to the teacher that Ian was already an avid and fluent reader, the teacher was unwilling to believe this, nor was she willing to check this out by giving him a simple reading test. The situation was complicated by the fact that Ian had long since passed through the stage of needing to 'sound out' words and now read silently and absorbedly; his teacher, even when she did notice him reading, assumed that he was simply looking at the pictures. In consequence, she insisted that Ian work through the reading readiness exercises with the rest of the children. His maths achievement was likewise advanced but as the teacher refused to test this either, she remained unaware of it.

Ian's anger and resentment reached such a stage that the school decided to have him assessed by an educational psychologist. His IQ was assessed as at least 170, and tests of reading achievement established that he had the reading and comprehension skills of a 12-year-old. He was six years old.

Ian's school refused to accept the psychologist's recommendation that he be accelerated — even though he was remarkably gifted in most academic subject areas. He progressed through school lockstep with age peers, growing increasingly bored and resentful. When he was in Year 4, at the age of 9 years 11 months, for the purposes of Gross's study, Ian took the Scholastic Aptitude Test – Mathematics (SAT-M), a standardised test of maths achievement taken by American 17- and 18-year-olds wishing to enter university. He had ceilinged out on every primary and secondary school-age maths test Gross had previously given him. The average score on the SAT-M varies from year to year but is usually around 500. Ian, seven years younger than the students for whom the test is designed, made the remarkable score of 560! Despite this his teacher, who 'didn't believe in' standardised tests, insisted that he undertake the Year 4 maths curriculum with the other 9-year-olds.

At the end of the year Ian's parents, who were not particularly well off, reluctantly decided to move outside the state education system and enrolled him in a K-12 independent school which had a reputation for extending gifted students. The school, however, would not permit him to grade-skip, nor would they agree to a subject acceleration in maths until he had 'proved himself' in class. The SAT score did not, apparently, constitute 'proof'. However, as a Year 5 student he was permitted to participate in a maths enrichment 'pull-out' program for Year 5-7 students, in which he excelled, and when, a few weeks later, his Year 5 teacher told the Principal, with considerable courage and honesty, that she simply did not have the knowledge or skill to extend his phenomenal mathematical abilities within the regular classroom, the school found a mentor for him — a maths teacher from the Senior School. This teacher was astonished by Ian's abilities and worked with

him through the year on the Years 8 and 9 maths curriculum, with the object of filling in the few gaps in his maths knowledge bringing him up to a standard which would allow him to join the Year 10 maths class the following year as a subject acceleration. This indeed occurred and Ian, while enrolled in Year 6 worked with the Year 10 students for maths. His success encouraged the school to allow him to skip Year 7 completely. He enrolled in Year 8 just short of his 12th birthday but took maths and computing with Year 11, science with Year 10 and social studies with Year 9.

Ian enrolled in a Bachelor of Engineering degree shortly before his 17th birthday and graduated, aged 20, with First Class Honours. He is now completing his PhD.

It was the professional integrity of one individual — his Year 5 teacher — in acknowledging that she could not meet his learning needs, that led to the beginning of an appropriate educational response from his school. Ian's previous teachers had been unable, or unwilling, to acknowledge this. The delivery of a developmentally appropriate curriculum should not depend on the professionalism of any one individual. If Ian's schools — either his first school or the school to which he transferred at the end of Year 4 — had believed his score on the Scholastic Aptitude Test, which he had taken under formal test conditions, so much time would have been saved.

Ian's story, from childhood to adulthood, is told in Miraca Gross's book ***Exceptionally gifted children*** *(Gross, 2004). Like most subjects in longitudinal studies, 'Ian' has chosen a pseudonym to protect his identity.*

The children and adolescents described in the case studies above are truly remarkable young people. Students like this appear rarely in our schools. By including their stories in this Module we are not suggesting that the majority of gifted students would be, or should be, capable of working at the levels which they have achieved. Rather, we are including these case studies to illustrate something we briefly alluded to in earlier Modules; that students at different levels of giftedness — mild, moderate, high, exceptional and profound — have different levels of academic ability and that we should not underestimate individual gifted students' capacity to learn.

If students like these can pass through years of schooling without their remarkable abilities being identified, how much more often may we be failing to identify and respond to more moderately gifted children?

Parents have known their children, and followed their development, for years before they enter the school system. Teachers should listen thoughtfully to what parents tell us about their children's early years. Rather than assuming that parents are biased or exaggerating when they describe unusual abilities in their children, we should use this informal 'parent nomination' and balance it with other forms of identification including, where possible, objective assessment on standardised tests of ability or achievement.

When her subjects were children and adolescents, Gross made regular surveys of the hours each child spent daily in voluntary reading, the title, author and subject classification of all materials read, the books which the children classed as current favourites, and their reasons for preferring these particular books. As with earlier studies of highly gifted children, Gross's surveys found that their reading interests were often very different from those of their age-peers and resembled those of older students. Indeed, they often read, with full comprehension and enjoyment, literature written for young people 5-7 years older.

This proved problematic, because, in general, by the time the children were in Years 3 or 4, their primary school libraries held no books which stimulated their interest. Indeed, some primary school libraries operated a kind of chronological apartheid with separate sections for junior, middle and senior primary students. This was extremely frustrating as most of these gifted children had already read the majority of books in 'their' section by the time they became old enough to access it! Similarly, many secondary school libraries had sections which only Year 11 and 12 students were permitted to access.

Inequity in 'equity'

Most of the young Australians in Gross's study undertook their primary education during the 1980s — in the era we described earlier in this Module as one of militant egalitarianism. In many schools 'equity' was confused with 'sameness' and suggestions that individual students should be 'singled out' for special treatment were frowned upon. Fortunately, children with intellectual or physical difficulties were exempted from this 'one size fits all' philosophy, as were children talented in sport and music, but the majority of academically gifted students were trapped by it. With a few notable exceptions such as the Selective High Schools and Opportunity Classes in New South Wales, the University High School acceleration program in Melbourne and a range of programs in Western Australia, schools kept gifted students with age-peers, and in mixed-ability classes, and, in general, few teachers knew enough about the needs of gifted students to even consider differentiating the curriculum for them.

The 60 young Australians in Gross's study are some of the most intellectually gifted young people ever discovered. There is little doubt that all of them would have benefited from academic acceleration; instead, the majority were retained with age-peers for their entire schooling or permitted a single grade advancement. In several cases schools justified the decision not to accelerate these students on the grounds that it would be unfair to offer an 'advantage' to one child that could not be offered to all. The mother of one of the most highly gifted of Gross's subjects was informed that it would be a violation of the principles of social justice if her son was given any work which could not be mastered by the majority of students in his class.

We will discuss, in Specialisation Module 6, some of the research on 'radical acceleration'. This is usually defined as any combination of accelerative procedures which results in a student graduating from high school three or more years earlier than is customary. It is very rare indeed for radical acceleration to comprise a single, three-year, gradeskip. Usually the grade advancements are separated by periods of consolidation. Obviously, radical acceleration is rarely practised, firstly because it is suitable only for extremely gifted students who are very mature socially and emotionally and who are eager to move much more speedily through school, and secondly because most schools will not even consider it as an option.

When the 60 young adults are grouped in terms of the degree of acceleration permitted, some interesting patterns appear:

A Young people who have been radically accelerated

B Who accelerated by two years

C Who accelerated by one year

D Who were retained with age-peers for the whole of their schooling.

Group A: Radical accelerands

Surprisingly, when one considered the sociopolitical beliefs of the era they were educated in, 17 of the 60 young people in Gross's study were allowed to radically accelerate through school. None regrets his or her acceleration in any way. Those who would, in retrospect, have changed things, say they would probably have preferred to accelerate still further, or have started earlier. The extremely gifted young Americans from the SMPY study who were surveyed in their 30s by David Lubinski expressed exactly the same views (Lubinski et al., 2001).

Some of the young people had a rough start to school but things improved for them later — Hadley Bond, who became Australia's youngest school dropout at age five, is one of these — while others were fortunate enough to enrol, right from the start, in schools where a teacher or school administrator recognised their remarkable abilities and argued for a strongly individualised program. All 17 are characterised by a passionate love of learning and almost all have gone on to take PhDs.

Despite being some years younger than their classmates, the majority topped their state in specific academic subjects, won prestigious academic prizes or represented their country or state in Maths, Physics or Chemistry Olympiads. Several won scholarships to attend prestigious universities in Australia or overseas.

In every case, the radical accelerands have been able to form warm, lasting and deep friendships. They attribute this to the fact that their schools placed them, relatively early in their schooling, with older students to whom they tended to gravitate in any case. Those who experienced social isolation earlier say that it disappeared after the first gradeskip. Two of the radical accelerands are married with children. The majority are in permanent or serious love relationships. Interestingly, they tended to choose partners who are also highly gifted.

Group B: Two-year accelerands

The six young people who accelerated by two years report as much, or almost as much, personal satisfaction with their education as do the radical accelerands — although most say they would have very much liked another grade-skip. None regrets accelerating. They are less likely to do PhD study than Group A, but the majority have taken Bachelors (Honours) degrees.

They are almost as likely as Group A to report satisfactory personal and love relationships. However, members of this group who were not permitted acceleration until later in their schooling (eg Ian Baker, part of whose school history was told in the Primary and Secondary case studies above) tend to find socialising difficult. Exceptionally and profoundly gifted students should have their first acceleration in the early years of school before they experience the social rejection which seems to be a significant risk for extremely gifted students who are retained in the mixed-ability classes. The skills of friendship building (rather than just playing together) are first learned in the early years of school and children who are rejected by their peers may miss out on these early and important lessons in forming relationships.

Group C: One-year accelerands

Four of the young people were permitted a single grade advancement. These young people are not deeply satisfied with their education. Their school experience has not been happy. They would have loved to accelerate by more than one year. After the euphoria of having new, challenging work, school became just as boring as it had been before the acceleration.

Why did these students' schools refuse to accelerate them further, when the first acceleration has been so successful? In general, the schools were afraid that, while one grade-skip had worked, further acceleration might lead to social or emotional damage in later years. In two cases the school was concerned for the self-esteem of other students because the accelerated student was performing so much better than they were!

The Group C students have tended to take undergraduate degrees and stop there. Because they have not had the experience of pitching themselves successfully, and over a period of time, at work which is truly challenging and demanding, they have no idea of the full extent of their capacities. They tend to have low self-expectations. Because of this they have tended to enrol in undemanding academic courses and they have consequently found university intellectually unchallenging. It is with this group that a serious dissatisfaction with friendships and love relationships starts to appear. Two have had quite severe problems with social relationships. Again, if children are not given structured opportunities in childhood to interact with developmental peers, they may not easily develop the skills of building friendships.

Group D: Students not permitted acceleration

The remaining 33 young people were retained in a lockstep curriculum with age-peers in 'inclusion' classrooms. The last thing they feel is 'included'. With few exceptions, they have very jaded views of their education. Two dropped out of high school and a number have dropped out of university. Several more have had ongoing difficulties at university — not because of lack of ability but because they find it difficult to commit to undergraduate study which is less than stimulating. These young people consoled themselves through the wilderness years of undemanding and repetitive school curriculum with the promise that university would be different — exciting, intellectually rigorous, vibrant — and when it was not, as the first year of university often is not — it seemed to be the last straw.

David, now aged 26, speaks for many of this group:

> *'All through my schooling teachers would say, "Yes, I know you know most of this but hang on, next year will be different." But the next year would be just the same, and the year after that, and the year after that again. Year 12 wasn't quite so bad because the curriculum was new in some respects and I had the carrot of university the following year dangling in front of me to keep me going. By this stage it really was all that* ***did*** *keep me going. And I was shattered to find that first year uni maths was Year 12 all over again. And the pace was* ***still*** *too slow. I started to get really depressed and I went to the uni counselling service and you know what they said? "Yeah, first year's pretty boring. It'll be better next year." What I wanted to say was, "So when am I going to start learning?"'*

Several of the non-accelerands have serious and ongoing relationship problems. These young people find it very difficult to sustain friendships because, having been, to a large extent, socially isolated at school, they have had much less practice, in their formative years, in the 'give and take' of social relationships. Roger says wryly: 'Socially, I have three feet; two left feet and the third one that I seem to put in my mouth every time I open it.' A number have had counselling. Two have been treated for severe depression.

The positive or negative influences of educational decisions extend far beyond the classroom. The great scholar John Feldhusen once said that rather than worrying about the consequences of accelerating gifted students, we should turn our attention to the consequences of not accelerating them.

Early predictors of high academic achievement

We strongly suggest that primary and secondary teachers, as well as early childhood teachers, should read this section. Its purpose is to discuss the strong predictive validity, for later school success, of early precocity in speech, movement and reading. We should listen carefully to, rather than dismiss, parents' claims that their children or adolescents were unusually advanced in the early years of school.

It's the first day of the school year and Mrs Morrison has the intake class at your local primary school. 'Twenty-three unknown quantities,' she says to Ms Carson, the Principal. 'Who knows what they'll turn out like.'

'Keep an eye on little Tara Maxwell,' says Ms Carson. 'I had her mum in on Friday telling me that she's reading already. Mum says she taught herself to read when she was 4.'

'I'd take that with a pinch of salt,' says Mrs Morrison. 'Probably she saw the big golden "M" and said "McDonalds".'

Researchers doing longitudinal studies often encounter the same scepticism. The retrospective nature of much of the case study research on giftedness in early childhood leads people who take a wholly or largely environmentalist view of giftedness to suggest that records of early speech, movement or reading arise from flawed parental memory or inaccurate recording. 'How can you **prove** that the kids in your study learned to speak before the usual age?' someone will say. 'You weren't around at the time — and you can't afford to simply believe what parents say!'

Modern day researchers have it easier than Terman had. We have audiotapes and videos to assist us. However, in recent years, the Fullerton Longitudinal Study of early and later childhood development has provided empirical evidence of the developmental advancement of intellectually gifted young children (Gottfried et al., 1994).

The Fullerton Longitudinal Study

The Fullerton Study traced the development of 107 children who were recruited through birth notifications of hospitals adjacent to the Fullerton campus of California State University. The children, who were one year old at the commencement of the study, were given numerous developmental assessments right through the first eight years of life. At age eight, seven years after the study commenced, they were assessed on the Wechsler Intelligence Scale for Children – Revised (WISC-R) and the 20 children who made a full-scale IQ score of 130 were designated the gifted group for the purposes of comparison with the other 87 children. The IQ range in the gifted group was 130-145 with a mean of 137.6, while the range in the comparison group was 84-128 with a mean of 110.9.

The Fullerton team therefore possesses objective, systematically collected data on the early development of a group of children who were identified as gifted several years **after** they entered the study. This is not, therefore, a retrospective study, but a developmental study conducted **in current time** and the consistent superiority of the gifted group cannot be attributed to flawed memory or parental bias.

The Fullerton Study found that differences in the level of intellectual performance between the gifted and nongifted children appeared as early as one year of age, and were sustained throughout the study. Interestingly, the earliest difference was found at age one, **on entrance to the study**, in receptive language. The Fullerton Study consistently noted significant differences in expressive language from infancy onwards. Assessments of comprehension, gross and fine motor skill, memory, and personal-social development consistently found the gifted group superior. Indeed, the only academic skill on which the gifted children did not display significant superiority was on numeracy — and the researchers noted that this was due to a ceiling effect on the test for the gifted group! Indeed, the Fullerton team concluded:

> *'Gifted IQ implies generalized high intelligence. Gifted children were superior across an array of cognitive tasks beginning as early as the pre-school period. Gifted children tended to be cognitively well rounded or adept. Globality rather than specificity in cognitive performance characterizes intellectual giftedness.' (Gottfried et al., 1994, p. 85).*

Although, as might be expected from the relatively small sample size, the Fullerton Study included no exceptionally or profoundly gifted children — the highest IQ in the group was 145 — its findings do lend credibility to retrospective assessments of unusual precocity in case studies of the intellectually gifted.

Developmental advancement in gifted children

If only we could take those teachers who genuinely believe that precocious intellectual and social development are merely a function of parenting and environment, and endow them, magically, with retrospective vision so that they could observe their highly gifted young students' often startling precocity from the first years, or months, of life! Even in early childhood many gifted children display significant and often quite striking differences from normal developmental patterns. The early development of speech, movement and reading are extremely powerful indicators of possible giftedness. Of course, not every child who speaks, walks or reads early is even moderately gifted (Jackson, 1992), but when these skills appear at unusually early ages, and particularly when they appear in tandem, they are generally linked to unusually advanced intellectual development.

Early development of speech

The average age at which children can be expected to utter their first 'meaningful' word (other than mamma-dadda 'babble') is around 12 months. By contrast, gifted children begin to speak, on average, some two months earlier. In addition, they pass through the stages of speech acquisition earlier and faster than children of average ability. By 18 months the average child has a vocabulary of 3 -50 words, but little attempt is made to link them into short phrases until the age of two; however, in gifted children, linking words into phrases can commence as early as 12 months. By age four there is a significant difference in the length of sentences spoken by average ability and gifted children, with gifted children producing sentences more than twice as long as their age-peers. (This body of research is discussed in full in Gross, 2004.)

The child in pre-school or kindergarten who 'talks like a book' and won't stop may well be a gifted child!

Studies of highly gifted children record instances of linguistic precocity far beyond even that of the moderately gifted. The average age at which Gross's exceptionally and profoundly gifted children spoke their first word was just under nine months! Eleven of these children spoke their first meaningful word by the age of six months.

The speech of some highly gifted children demonstrates quite remarkable fluency and complexity. Adam Murphy, one of Gross's subjects, uttered his first word at five months and by two months later was talking in three- and four-word sentences. His mother recalls the astonishment of supermarket assistants as Adam, aged seven months, gave a running commentary on the grocery items as she wheeled him past the shelves in the shopping trolley. Peter, whose first word, spoken at eight months, was 'pussycat', surprised his parents at 18 months by announcing, 'I think I'll have a quick shower.' Wendy Roedell and her colleagues reported a 2-year-old who regularly used such complex sentences as 'I'm trying to figure out where I left my dancing shoes' and 'I want to take a look at this story to see what kinds of boys and girls it has in it' (Roedell, Jackson & Robinson, 1980).

Occasionally the speech of highly gifted children may be delayed, as in the case of Jonathon and Christopher, two brothers in Gross's study who did not speak until 18 months and 21 months respectively and whose mother was warned by their pediatrician that this might be indicative of intellectual disability. (Jonathan later tested at IQ 170 and Christopher at IQ 200!) In these situations, however, when speech does appear, it often arrives in the form of phrases or short sentences, rather than words in isolation. Robinson (1987) reports a young boy whose first utterance, at 20 months, was 'Look! Squirrel eating birds' food!'

Early development of mobility

Just as gifted children generally demonstrate an unusually rapid progression through the stages of speech development, the development of mobility also tends to arrive early and to progress with unusual speed.

The age at which children walk when led or supported by an adult may be several months earlier than the age at which they are able to walk by themselves. The average age for walking while supported, in the general population, is reported as 11 months, and the average age of walking unassisted as 14-15 months (Vaivre-Douret & Burnod, 2001). Studies of the early movement of gifted children generally report that they pass through the stages of walking on average, 2-3 months earlier than their age-peers. Some remarkable examples of early movement have been reported in children who later tested as highly gifted. Linda Silverman (1989) describes a girl of seven months who stood alone, climbed into chairs unassisted and went up and down stairs by herself. Gross (2004) describes Rick, of IQ 162, who was sitting up by himself at four months, running at 11 months and riding a two-wheeled bicycle unaided at age three. The average age at which Gross's subjects of IQ 160+ sat up unsupported was 6.1 months, as opposed to 7-8 months in the general population and the average age at which they were walking independently was 12.1 months — fully three months earlier than is usual.

It is not surprising that the ages at which their children walked and talked tends to stay in the minds of parents of gifted children. Early mobility means an earlier age at which children can walk into trouble. Early speech means that the 'Why? Why? Why?' stage comes earlier too! Gifted children are not an unmixed blessing to their parents.

Early development of reading

Research on intellectual giftedness suggests that one of the most powerful indicators of giftedness is early reading. Terman (1926) reported that the children in his longitudinal studies started to read significantly earlier than children in the control group.

Studies undertaken in the last 30 years, when print has become much more easily accessible to young children through television and the other advertising media, show an even greater incidence of reading among gifted children in the early years. VanTassel-Baska (1983) reported on 270 13- and 14-year-olds who had achieved high scores in either maths or English in the Mid-West Talent Search. VanTassel-Baska found that fully 80% of this group was reading by age five and 55% were reading by age four. More than 90% of Gross's subjects of IQ 160+ were reading before their fifth birthday.

Research has found that children who demonstrate a precocious development of speech and movement are highly likely to develop reading skills substantially earlier than their age-peers. The research literature on the highly gifted contains a wealth of information on extremely gifted children who learned to read either with no assistance or with minimal assistance from their parents.

There are two notable outcomes of the remarkable precocity in speech, movement and reading among gifted children.

Firstly, their early mobility allows gifted children to move around independently and explore for themselves quite a bit earlier than their age-peers of average ability, while their very early speech enables them to express their ideas, seek information and interact verbally with their parents and family members at an age when many children are only beginning to experiment with oral communication. Both early movement and early speech contribute significantly to these children's capacity to acquire and process information, while their early reading gives them access to an information bank not usually accessible to children until several years after school entry.

Secondly, gifted children's difference from their age-peers may be identifiable from an early age, not only to their parents but to neighbours and other members of the community. It is difficult either to ignore or to conceal a pre-schooler such as Andrew, in Gross's study, who had developed a passion for number and would gleefully inform strangers waiting in line for a bus that they had, between them, 37 buttons on their clothes! Community attitudes towards Andrew's intellectual precocity varied significantly. Some people in the line would respond with amused chuckles, or engage him in conversation; others would frown or ostentatiously turn their backs on this small poppy who was growing too tall, too quickly.

Key points from studies of early development

Longitudinal studies such as the Fullerton Study and the studies of Terman, Gross and others have a number of common key findings.

- Parents are excellent judges of giftedness in their pre-schoolers. Contrary to common belief, they do not, in general, exaggerate their children's abilities and their memories of the children's early development are generally accurate.
- In the early years, children who are intellectually gifted tend to be advanced in all areas of development.
- Gifted children and age peers of average ability display different levels of ability in speech, movement and reading in the early years and these differences are strongly predictive of intellectual ability.
- The intellectual and academic superiority of gifted students lasts from infancy right through adolescence and into adult life. Gifted children's love of learning may be dimmed by schools which withhold appropriate educational provisions but the **capacity** to learn does not 'burn out'.

Characteristics of giftedness in areas other than academic

(Guest author: Professor Karen Rogers, Director of Research, GERRIC)

In Extension Module 1, we introduced Professor Karen Rogers' synthesis of the research on the learning characteristics of intellectually gifted students. This section explores the research on characteristics of students gifted in creativity, leadership, and the visual and performing arts.

Characteristics of giftedness in creativity

This form of giftedness is most often identified using a test of creative thinking, which will measure such skills as **fluency** (the generation of many answers in short order), **flexibility** (the generation of many perspectives or new directions in short order), **elaboration** (improvement of an idea through details, embellishments, and extension), and **originality** (production of an unique thought, idea or solution). In general, the score differentials between gifted and regular test takers have centred on fluency, ideational fluency, flexibility, elaboration, and/or originality, rather than on the total test battery composite score. For the 43 studies on differentiating characteristics of this form of giftedness, the distinguishing cognitive and learning characteristics include:

- **Scanning**: Defined as the capacity for 'taking in' the whole of a setting, situation, or task and then reducing it to a manageable part that can be changed or manipulated. Described first by Sternberg (1985) as 'selective encoding', it involves discrimination in taking in the relevant characteristics of the situation. For the creative poet this might mean looking across all the words and phrases he or she has jotted down until a new word or line seems 'right'. For the creative inventor, this might mean forming in his or her mind a rough or incomplete mental 'sketch' of a possible invention. This scanning is the first step toward the fashioning of a creative solution, product, or performance. Getzels and Csikszentmihalyi (1976) named this capacity 'problem finding' — that is, knowing a good problem when one sees it and having the vision that is needed to select the 'important' element or essence of a problem. This scanning ability is a qualitative difference between regular learners and creatively gifted learners, although some difference in degree is found when comparing creatively gifted and intellectually gifted learners.

- **Internal locus of control**: Defined as the attribution of one's success or failure to one's own ability (or lack of it) or to one's own effort (or lack of it). Since 1950 and the groundbreaking work of J.P. Guilford, researchers such as Amabile (1983) and Schaefer and Anastasi (1968), for example, have pointed out the tendencies of creative individuals to display strong self-acceptance and positive self-evaluation behaviour, which, in turn, lead them to look **within themselves** for the reasons why they have done well or not so well on a task or problem presented to them. With this internal locus, then, they pursue a problem and its solution with a single-mindedness and persistence despite difficulties. Most researchers in this area suggest that this attribution found in the creatively gifted is essentially a difference in degree rather than a difference in kind.

- **Flexibility in approach to learning and production**: First studied in adult scientists and later in creative children, this capacity has been defined by Hennessey and Amabile (1988) as the ability to find a creative solution or to go on working towards one, viewing the situation or setting with little or no acknowledgement of its constraints. Simonton (1995, p. 470) describes this flexibility in creatively gifted individuals as '… making their senses more open to the influx of fortuitous events in the outside world'. Torrance (1966) found that this ability to overcome or fail to 'see' difficulties on the way to solutions was strongly associated with a child's locus of control and self-esteem. What characterised the behaviour of these children was a willingness to change the so-called constraints, or change their own perspective of the situation as they worked toward an unusual solution on his Unusual Uses, Circles, and Draw a Person sub-tests, which ultimately formed parts of the Torrance Tests of Creative Thinking. Perhaps due to the means by which this characteristic is measured, this behaviour is probably more a difference in degree than in kind when comparisons are made with the regular population of learners in our schools.

- **Re-structuring of learning environment and learning**: According to Barron (1988), the restructuring of a situation, whether it be a creative child's desk — where it gets 're-placed' in his or her classroom as well as how it is internally 'organised' — or a task and its parameters, suggests that the creatively gifted individual incorporates six 'ingredients' in this restructuring: (1) recognising existing patterns; (2) making connections; (3) taking risks by making changes; (4) challenging 'obvious' assumptions; (5) taking advantage of chance; and (6) seeing in new ways. Although Barron first worked with MacKinnon in finding this true of creatively gifted adult scientists, architects, and writers, research since that time has found this behaviour to hold true in other creative occupations and with different developmental levels and ages. As with flexibility as a difference in behaviour among the creatively gifted, this difference seems to be a difference in degree rather than in kind.

- **Willingness to take cognitive, social and physical risks**: As this characteristic suggests, the creatively gifted child does not let the possibility of failure deter trying something new. Finke (1995, p. 273) has described this as 'manipulating the preinventive forms in playful ways', while Schooler, Fallshore, and Fiore (1995) term this 'playfulness'. One can watch a highly creative child undertake an art project, for example, quickly choosing materials and beginning to execute a design or product, only to start over with an entirely new set of materials and design ideas if or when the first process does not 'work out'. In observing such a behaviour, it is evident that the child does not worry about failure or making a mistake and has the confidence to try again should the outcome not meet his or her expectations. This trait in creatively gifted individuals seems to be a difference in degree rather than kind.

- **Tolerance for ambiguity**: Defined (Tetenbaum & Houtz, 1978; Urban, 1991, 1995) as a component of personality, this 'mind set' seems to allow the creative individual to pursue original solutions to a task under conditions that cannot predict outcomes of the person's effort. The creative child appears comfortable continuing to work on a problem or idea without actually being able to see whether he or she is on the 'right track' or 'making progress'. For the creatively gifted, this characteristic appears to be a difference in degree rather than in kind.

CASESTUDY

James is flamboyant in his dress, really into the 'grunge' scene currently, but fun to be around. His excitement when he thinks of an idea is contagious, as is his sense of humour. He also exudes a confidence that his idea or solution will work. His school performance is patchy, to say the least. In classes where the teacher recognises and respects his fine, original mind, he outdoes himself in the quality and quantity of his work. But in classes where 'no exceptions are made,' where assignments are rigid and deadlines are enforced, James refuses to produce and does fail. This happens regularly as he acquires new teachers each year. One can almost predict in which classes James will do poorly by which teacher he is assigned to. This does not seem to disturb him nor keep him from trying again to do something unique when he does attend to the conditions of the problem he is given to work on. He thrives on taking a chance to do something 'new and different', and if his solution does not work, he will pick himself up and try again another day.

As a result, James's general skill levels are poor and there is some question about whether he will do well enough to be given a place at university. He has no specialised talent area at present, and for him to be able to fully use his high degree of originality, he must acquire the foundations of knowledge and skills in some area. According to David Feldman (1980) and David Perkins (1981), he must become an 'expert' in some area for his originality to bear fruit. Without that, his creativity will probably never be fully utilised.

There is little doubt that James will be happy in adulthood; he has the natural flexibility to rearrange events for his own comfort. However, it will be a loss for society if James' creativity is not channelled into finding solutions and reformulating the problems that we have been grappling with for years, such as cures for cancer, prevention of ecological destruction, replenishing our ozone layer in the stratosphere, or providing food for the underdeveloped nations of the world.

Characteristics of leadership/psychosocial giftedness

This form of giftedness is most often identified by a student's performance on a task or project that has involved others or by engagement in an organisation or activity involving cooperative work with others. The identifier is most often a sport coach, a teacher, a school administrator or counsellor who has noted unusual attention to detail, successful completion of a complicated task or project, extraordinary personal interactions, and effective control. The recognition is comparative, that is, how this child has performed or conducted him/herself compared to others in the same context. In some cases, self-report assessments of leadership characteristics are used, but in most cases, no instrumentation is involved in the identification process. The distinguishing cognitive and learning characteristics, supported by 14 research studies include:

- **Task analysis/global scanning**: Task analysis has been defined by Sternberg (1985) as deconstructing a defined problem into a series of steps, beginning with the end goal and working backwards to the initial state. Studies of gifted leaders have clarified the leader's capacity to understand a given task and to be able to break it down into its parts, again, beginning with the ultimate outcome and planning the steps that would need to precede that outcome. Global scanning involves the capacity to apprehend the whole of a situation or context in a single effort rather than putting all the 'bits' of the context together to make the whole. Research have found gifted leaders significantly more likely to conduct this scanning before task analysis ensues.

- **Cognitive, affective, and visual perspective-taking/high social cognition**: These abilities can be defined as capacities to assume the view point of another medium, be it an expressed idea (cognitive), an expressed feeling or emotion, or an image viewed from an unusual perspective. Guilford (1981) was able to confirm affective perspective taking, which he labelled 'cognition of behavioural content', through factor analysis of his 'Structure of the Intellect' model of intelligence. In later work he confirmed social cognition, labelled 'divergent production of behavioural content', which basically means being able to cope with the behaviour of other people. Keating (1978) was able to analyse the relationship between the ability to resolve social dilemmas and verbalise social insights, measures of social cognition as well as cognitive perspective-taking. The inferring of another's visual experience has been observed in gifted children as young as three years (Walker & Gollin, 1977) and improves greatly as the children grow. Abroms and Gollin (1986) argued that these three forms of perspective-taking allow the gifted leader to 'stand in another's shoes'.

- **Advanced moral reasoning**: Numerous studies have attempted to study the relationship between intelligence and advanced stages of moral reasoning using Kohlberg's model. The general research has been contradictory; however, studies by Karnes and Brown (1981) and Tan-Willman and Guttridge (1981) linked advanced moral reasoning with children showing high levels of social sensitivity to the attitudes and values of others in their environment. Karnes and Schwedel (1981) studied leadership in pre-school children, discovering a precocious awareness of the needs of others, an ability to influence others, and an assumption of responsibility beyond what is expected for their age.

- **Lack of school-related anxieties (test taking, impending deadlines, teacher issues)**: As the set of behaviours suggests, the child who is a gifted leader has high self-efficacy and confidence that he or she can succeed (Bandura, 1973). Sternberg, Conway, Ketron and Bernstein (1981) included these behaviours as part of their conception of social competence: the individual thinks before speaking and doing, does not make snap judgements, assesses the relevance of information to a problem at hand, is on time for appointments, adapts well in social situations, is warm and caring, and is open to new experiences, ideas, and values.

- **Personal magnetism**: This compilation of personal characteristics generally attracts others to listen to or follow the gifted leader. Jarecky (1959), for example, measured such characteristics with the Vineland Social Maturity Scale, concluding that adolescents who received high ratings on sociograms, and 'good' characteristics ratings by their teachers on checklists, and who scored positively on the Vineland instrument, showed leadership characteristics such as: (1) being accepted for their leadership qualities by the majority of people who knew them; (2) being often involved in a social venture in which they made constructive contributions; (3) being considered arbitrators or policy makers by peers; (4) being able to make lasting relationships with peers and adults; (5) stimulating positive and productive behaviours in their peers; (6) using a personal approach to social complexities, using humour and insight.

- **Communication precision/expression**: This capacity is defined as the ability to modify one's form and content of speech according to what he or she presumes the listener will understand. It has been witnessed in studies of pre-school though adolescent gifted leaders by Maratsos (1973) and Menig-Peterson (1975), among others.

CASESTUDY

Jane has the uncommon knack of getting along with almost everyone. She seems to genuinely like everyone she meets and those feelings are almost instantly mutual. She is very perceptive in understanding other people's feelings and concerns; at times she has almost painful experiences when her empathy gets the best of her. Her parents tell of the time she cried and cried after seeing a documentary about the children starving in Ethiopia. She kept asking, 'Why can't I help them? What can I do?' She was five years old at the time.

In primary school, Jane got along well with teachers because she was so dependable. When teachers wanted group projects done for parents' night, they knew that putting Jane in charge of the project would result in a high quality, attractive project that every parent would perceive as a successful classroom experience. Jane, of course, put in loads of extra time getting the project complete, time she seemed to genuinely enjoy despite the fact that others in her group were not doing their part.

In secondary school, Jane is well known for her wide participation in competitions, sports, fundraising efforts, and student council. She is always looking for new experiences, and before long she has gravitated into some kind of leadership role within that organisation. In the classroom, her ideas are looked up to by her classmates. She has the knack of relating almost any content to the human situation, or at least to everyday relevance.

There are problems for Jane in school, however. It is easy for her enthusiasm for new experiences to spread her too thinly. Often this means that her extracurricular activities take up more time than her school work. So far she has been able to get along on her finely attuned intuitive sense, but as her course work becomes more difficult (especially as she gets closer to university), she is going to find that she has not acquired enough content or enough skills to let her get by on so little time for study and reflection. She runs a huge risk of becoming one of the 'college dropout' statistics. The Janes of the world keep our schools running smoothly, but life down the road may not be so smooth for them if teachers don't help them more concretely with what schools are supposed to be about, while they are still in the school.

Characteristics of visual/performing arts talent

This form of extraordinary performance is most often identified by a child's specific performance in an arts area, such as drawing, painting, sculpture, dance, music performance, music composition, acting, creative writing, theatrical writing, graphic design, etc. For the 29 studies on differentiating characteristics of this form of giftedness, the definition of 'artistic talent' referred most often to students producing or performing in their art form anywhere from two to four years ahead of their current age. The distinguishing cognitive and learning characteristics include:

- **Broad, deep content/skill acquisition in a specific artistic area**: What the specific content and skills are in each arts area differs radically by art form. For music, this breadth and depth can encompass an understanding of the music the individual is either performing or composing. Both talents appear to be discrete and do not necessarily exist in the same individual (Barzun, 1965; Sessions, 1965). The skills one might identify for the talented musician include melody and pitch discrimination (Shuter, 1968), sensitivity to harmony (Shetler, 1985), musicality, or a sensitivity to musical meaning (Mursell, 1958). For the visual arts, the talent is most evident in an ability to draw well and early (Clark & Zimmerman, 1984) and aesthetic sensitivity, the knowledge of when a product or performance is done well, is finished, is balanced compositionally, etc (Winner, 1981). In dance, the skill appears to be an ability to discern, imitate, and remember kinesthetic patterns in detail (McKayle, 1966), and understanding of the semantic and emotional content of a dance (Duncan, 1927). In drama, the skills include the ability to discern and imitate speech patterns and gestural mannerisms (Gardner, 1973), comprehension of verbal material (Wolf, 1981), and the ability to remember and recreate emotions or emotional states (Stanislavski, 1948). Research suggests that these skills are differences in degree rather than kind.

- **Intense motivation to learn and concentration on learning in specific artistic area**: As this characteristic suggests, the artistically gifted child tends to almost seem obsessive in his or her pursuit of improved performance. There is a high level of perseverance from a very early age (Meier, 1966), and a willingness to spend long hours early on 'practising' or perfecting their art form (Bloom, 1985). There is often an emotional intensity (Pendarvis, Howley & Howley, 1996) that seems to keep gifted artists 'glued' to their art form. Much argument exists as to whether this characteristic or behaviour is a difference in kind or in degree.

- **Intense need to achieve (nAch) and to be recognised in the talent area**: Defined as a drive by Jung many decades ago, this need to feel competent, to feel in control of one's art form and to be recognised as 'good' in the art form has been described as a difference in degree when comparing gifted artists with regular non-artists. What it translates into is the willingness to persevere and practise the art form until self-recognised perfection is achieved. This recognition is often enhanced or shaped by the individual's arts teacher or tutor (Bloom, 1985), as the two set out 'benchmarks of progress' through exhibitions, performances, or competitions.

- **Self-monitoring of performance in all areas**: Again, most probably a difference in degree rather than kind, this cognitive ability can be defined as the capacity to judge one's own performance or current level of skill accurately and objectively (Sternberg, 1985). The acclaim or applause of others usually holds 'second fiddle' to their own assessment of performance or product (Rogers, 1986).

- **Memory**: Defined as the ability to recall or remember particular content, specific to a single arts domain — auditory for music and theatre, visual for arts, verbal and episodic for drama, and kinesthetic for dance. Hermelin and O'Connor (1980) suggested that musically gifted children are more accurate and quick at matching pairs of words, synonyms, and picture pairs than are intellectually gifted children, but both groups are significantly faster and more successful at these matching tasks than are regular learners. Rogers (1986) suggested that this perceptual, motor, and decision speed differential may be a result of artistically gifted individuals' extraordinary ability to 'decode' an alternative symbol system, whether that be reading music, learning movement patterns, executing art elements in two- or three-dimensional forms, or interpreting written words into body and voice expressions.

- **Preference for working independently or with a mentor in specific talent area**: This cognitive style preference, which includes the desire to be responsible for one's own learning, to be given unstructured learning tasks and assignments but within a structured learning environment, to work on projects and tasks individually, and to engage in independent study, has been researched consistently since the 1960s by administering learning styles inventories to large groups of gifted and regular learners and noting the strength of the differences in preference for independent learning (eg, Stewart, 1981; Dunn, Dunn & Price, 1981). Bloom (1985) also noted this difference in degree among gifted sculptors and pianists in his longitudinal study of talent development in the artistic, academic, and athletic domains.

Jon has always 'marched to a different drummer'. Life for him has been filled with perfecting a wonderful ability for acting. This has meant getting up at 5 am to memorise and practise lines and scenes for a couple of hours before getting ready for school, rushing to acting, voice, and movement lessons after school is over, and rehearsing for a few more hours in the evening before going to bed. Those teachers who know how much time Jon spends practising and rehearsing are vocal in calling this 'unhealthy' and 'not normal.' His parents have constantly heard teachers say to them in conferences that if only Jon would put into his school work what is put into acting, he would be a straight-A student. There is no question that Jon is probably very bright academically. There are flashes of this in class when there are competitions, especially with tasks such as telling if two things are alike in appearance or in meaning. Jon has an amazing eye for details.

Socially, Jon gets along fairly well. He has one or two close friends (who are usually involved in some kind of artistic endeavour), but beyond that does not seem overly concerned about acquiring a large group of acquaintances. His usual topic of conversation has something to do with theatre or some distantly related idea concerning drama. Most of his peers find this either boring or just don't understand why he finds that so interesting.

Psychologically, Jon is a committed individual. To outsiders, he appears almost obsessive or compulsive (dramatic) about the talent area. Long ago, Jon decided to further his talent and to become best at it, even if that meant being less than perfect elsewhere. Thus, performance in academic subjects is sporadic. Jon does projects and assignments only when time can be found which won't interfere with his acting and performances. But the choices have been made and academics are on the losing end of that decision.

Schools are committed to educating every child, and teachers have assumed that every child wants to learn everything there is to learn. Little motivation for academic learning is perceived as something wrong — either with the home or the child. It is difficult for the nurturing nature of a teacher to meet up with Jon, because this student has made unpopular decisions. We could argue that we should just let Jon be, but democratically we can't. He needs a thorough grounding in our culture. As E.D. Hirsch (1987) argued so persuasively in his book, ***Cultural literacy****, the schools must provide Jon with this literacy. As things now stand, he may not get this education.*

Questions for Reflection

- Which of the topics addressed in this Specialisation Module have you found most valuable? Why? In what ways has your thinking been changed or confirmed by what you have read?

- Can you think of a student in your present school or in a school where you have previously taught who, in retrospect, you think may have benefited from off-level testing? Is there a student in your present class who shares some similarities with that student?

- Longitudinal studies provide powerful evidence of the benefits of acceleration. To what extent does your school use acceleration with gifted and talented students? If your school has rarely or never accelerated a student what beliefs or attitudes among your colleagues may have led to this?

Resources

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