Understanding & Identifying Gifted Learning Disabled Students

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Abstract
Up to 30 per cent of gifted students display a learning disability, with 10 per cent reading at two or more years below their grade level. They are referred to as being ‘gifted learning disabled’ or as having the dual exceptionalities of giftedness and learning disabilities. For these students, their learning disability is more likely to be recognised and targeted in teaching than their gifted ability.

The present study reviews their learning characteristics and explains these in terms of an information processing model of learning. Nine characteristics are addressed: their superior general intellectual ability in at least some domains of knowledge, a global wholistic preference in thinking, a negative academic self-concept, low resilience in learning, patterns in motivation to learn orientation, their use of metacognition, their ability to show what they know, their uneven rates of development, their high standards and goals, and the quality of their interpersonal interactions.

The paper uses these characteristics to recommend a set of procedures for identifying these students. It examines the influence that a learning disability can have on the display of gifted knowledge and describes how dynamic assessment procedures can be used to obtain a more accurate diagnosis. It describes the two main types of general ability profiles that emerge.

Procedures for assessing creativity and divergent thinking, a learning disability, aptitude in particular areas, an intrinsic motivation to learn, self-concept, metacognition and self-management of learning are discussed.

To his teachers, Adam was a conundrum. He was a very quick thinker, but not in the ways that would help him excel academically. He had excellent knowledge of a range of subjects but this didn’t seem to help him achieve academic success. His answers to questions were unexpected, although, when analysed, creative. On excursions he could be relied on to see ways around obstacles that arose; his teachers valued his ‘native intelligence’ on these occasions. It was less valued in classroom contexts in which they were developing a topic with a group and Adam would interject with ideas and questions that were either ‘marginally relevant’ or ‘further down the track’. They wished he would put his energy more into improving his spelling and writing ability, that were extremely low, and his recall of the times tables.

Ann, an eight year old, was also perplexing to her teachers. In class she was ‘off task’ and daydreamed a lot. She did not finish most tasks, frequently lost her place and made many careless errors. Her distractability meant that she was frequently disruptive. As a consequence, her level of academic achievement was low. Her teacher interpreted her inattention and impulsivity as a lack of interest in learning and her preference to avoid tasks. As well, however, her teacher noticed her comparatively high level reading ability and her advanced oral language capacity and had difficulty reconciling the two sets of observations.
in place gifted instruction; they do not see this as appropriate (Minner, 1990). Several factors make the identification of this condition difficult (Brody & Mills, 1997). The low achievement can be due to a range of causes, including attention deficit hyperactivity disorder (ADHD) (Leroux & Levitt-Perlman, 2000). Hyperactive behaviours are frequently linked with giftedness (Clark, 1992; Barkley, 1990), leading to misdiagnosis. Gifted children often have an unequal balance between advanced intellectual ability and/or creative talent and an emotional level which has not advanced to the same degree (Silverman, 1992). They may understand a topic but not be equipped emotionally to deal with it.

The low achievement can also be due to factors such as socioeconomic status or culture (Dole, 2000). Gifted Latino and African American youth in United States schools are at a comparatively high risk of not reaching goals commensurate with their potential ability. Poverty, unemployment and high school dropout rates lead to high underachievement rates (Ford, 1994; Hebert, 1996). They may, for example, face pressure from peers who think that school achievement is unacceptable culturally (Ford, 1994; Fordham, 1997) and underachieve intentionally.

This article examines a third cause of the dual exceptionalities, that of learning disabilities. These students display comparative underachievement in areas such as reading, spelling and mathematics. The primary cause of the underachievement is not immediately obvious. It is not, for example, attributable to low motivation or to socioeconomic status or culture. Instead it has been attributed to a 'processing deficit' (Brody & Mills, 1997), a concept that has often been only vaguely defined in the literature (McCoach, Kelle, Bray & Siegle, 2001). It is estimated that up to 10 per cent of high-IQ children read two or more years below grade level, and up to 30% show a discrepancy between their mental age and reading achievement (Little, 2001; Winner, 1996). From the perspective of learning disabilities, the estimates of the proportion that is gifted ranges from 2% to 5% (Yewchuk & Lupart, 2000). This is attributed in part to variation in the specific characteristics of the disability and the criteria used for assessment. In this article we examine the learning characteristics of these students, how their learning can be explained, and how they can be supported in teaching.

DEFINITIONS
To understand the complexities of gifted students with learning disabilities, it is recommended that the concepts "giftedness" and "learning disability" be defined separately (Brody & Mills, 1997). To provide a context for this, it is useful to consider the opening question asked by Ferter (2000) "What do Albert Einstein, Thomas Edison, Leonardo DaVinci, Walt Disney, Whoopi Goldberg, Lindsay Wagner, and Robin Williams have in common? All are reported to have learning disabilities" (p. 44). In a similar vein, in his excellent book In the Mind's Eye: Visual Thinkers, Gifted People with Learning Difficulties, Weir (1991) profiles eleven of the world's greatest thinkers. The two concepts, far from being at opposite ends of the learning spectrum, are related and need to be integrated.

Giftedness and talent have been defined in various ways. One definition intended for legislative purposes (Marland, 1972) specifies gifted and talented children as having outstanding abilities and capable of high performance in any of a range of areas: general intellectual ability, specific academic aptitude, creative or productive thinking, leadership ability, visual and performing arts and psychomotor ability (this category was later deleted). Definitions used in instruction have identified the processes associated with giftedness, Renzulli (1986), for example, defined giftedness as the product of three interacting clusters of traits that can be applied to any area of human potential: above average intellectual ability, high levels of creativity and high levels of task commitment. A similar 'process' definition provided by the Columbus Group (Morelock & Feldman, 1991; Morelock, 1996, 1997) defined giftedness as asynchrony of development in which advanced cognitive abilities and heightened intensity combine to create inner experiences and awareness that are qualitatively different from the norm.

A distinction that is useful to the present discussion is that between giftedness and talent, provided by Gagne (2000). The term 'giftedness' is used to refer to natural abilities that have not been developed or shaped by educational processes (the 'aptitudes' or 'gifts') while the term 'talent' refers to the superior mastery of abilities or skills and knowledge that have been developed, through educational processes, to a level that can be described as superior. This distinction is important to the conceptualisation of GLD. These students are seen as having natural abilities but not developing related talents during exposure to educational activities.

A contemporary definition of learning disabilities, provided in the Individuals with Disabilities Education Act, U.S.C.A., 105-17 (1997) defines 'specific learning disability' as a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written. The disability can be displayed in 'imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations' (sections 602 et. seq.). The disorder includes perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. As with earlier definitions of learning disabilities, it is a 'definition of exclusion', identifying a number of causes that are not responsible primarily for the learning problem. In other words, the disability is not the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.

A learning disability is identified operationally as a discrepancy between intellectual ability and achievement. In the area of literacy disabilities, the underlying processes include using the sound properties of spoken language (or phonological and phonemic processing), recalling the names of items and comprehending letter clusters (or orthographic processing). It should be noted that some definitions of learning disabilities neglect dual exceptionalities such as giftedness/learning disabilities (Brody & Mills, 1997), but allow for their co-occurrence because they do not set upper limits on general intelligence or specific abilities in any one area.

THE LEARNING CHARACTERISTICS OF GIFTED UNDERACHIEVERS
Prior to examining the procedures used to identify students who display the
dual exceptionalities of giftedness and an academic learning disability, it is useful to examine a model for describing learning generally. This will be used to explain the learning of students who display the two exceptionailities.

**The knowledge students need to learn**

The knowledge students need to learn can be categorised broadly into two types:

- **academic knowledge**

  knowledge that is taught at school because it is valued culturally. This knowledge comprises school curricula, such as reading, spelling, quadratic equations or the important dates in history. Students have little control over decisions to learn this knowledge.

- **personal interest knowledge**

  the knowledge that interests individual students, the knowledge that they are keen to know more about, that they pursue spontaneously.

The gifted individuals with learning disabilities mentioned earlier would be seen as knowledgeable. The ways in which they displayed evidence of an outstanding ability or talent were not necessarily those taught at school. Their knowledge was not 'school' knowledge. They had difficulty learning this knowledge. Instead, they built knowledge around the topics or issues that interested them at the time. Gifted and talented children prefer to learn personal interest knowledge. To be seen as 'successful students' while at school, they need also to learn the culturally valued knowledge.

**Explaining the characteristics of gifted underachievers**

How a person learns any topic is determined by a number of factors. These include what the learner knows about the topic, how to learn, the learner's motivation to learn and self-efficacy as a learner of the subject area.

The first factor relates to what the student knows about the topic. A number of perspectives concur on the complexity of ways in which learners can think about a topic. Most psychometric models of general ability or intelligence (Thordike, Hagen & Sattler 1986; Wechsler, 1992) and developmental theories recognise 'verbal' and performance or 'nonverbal' knowledge. Piaget (1954) discriminated between an abstract understanding of a topic used to reason logically (operative knowledge) and one's personal copy of reality, represented in imagery (figurative knowledge) while Vygotsky (1987) identified gestural, iconic and symbolic forms of knowledge. Gardner (1993) differentiated knowledge into seven, and later, eight ways of knowing.

Analyses of cognitive style propose that learners show a consistency in how they use information during learning and thinking. They group the multiple ways of knowing into two 'preferences' or 'styles': learners prefer either to visualise or to code verbally the information on which they are working. They identify the imagery-verbal dimension (Riding & Cheema, 1991) or a concrete versus abstract dimension (Gregorc, 1982; Kolb, 1984). Dual coding theory (Clark & Paivio, 1991) proposes a similar encoding mechanism; that people have both verbal and imagery codes for processing information and, in any situation, may use either or both.

These descriptions point towards a multi-faceted view of knowledge and allow the existence of high ability in some area without equal abilities in others. This view accommodates the simultaneous occurrence of giftedness and a learning disability.

The second factor relates to the thinking strategies that students use to convert information to knowledge at any time. The ways of thinking have been grouped into two types (Riding & Cheema, 1991): (1) those that analyse the information into parts and sequence the parts, step by step (analytic-sequential strategies) and (2) those that focus on the overall idea and link it with other ideas at once rather than in a sequence, that integrate ideas with other ideas and treat each idea as a whole (holistic or synthetic-global strategies). While most learning requires learners to alternate between the use of both types of strategies, some students show a preference for one. Gifted underachievers show a tendency to over-use wholistic strategies.

A third factor relates to the ability to self-regulate their cognitive or thinking strategies, that is, the metacognitive strategies to acquire knowledge (Hong, 1995; Meece, 1994; Schunk, 1991; Zimmerman, 1990).

A fourth factor relates to the nature of the motivation to learn. Strategy activation and transfer are managed by a set of motivational variables (Orah & Golan, 1991; Meece, Blumenfeld, & Hoyle, 1988) such that students' levels of cognitive engagement depends on both motivational and cognitive factors working in synchrony (Pintrich & Schrauben, 1992). Their motivational goals, the purposes they have for learning, influence the quality of their learning and their academic achievement (Meece, 1994; Pintrich & Schrauben, 1992).

Motivation is the process by which goal-directed behaviour is instigated and sustained (Schunk, 1990). Two generic types of motivation to learn have been identified (Deci, 1975); (1) learning that is internally driven, that is, intrinsic motivation and (2) learning that is externally driven, that is, extrinsic motivation. The two types are mediated by different perceptions (Deci & Ryan, 1985); learners are extrinsically motivated when they learn for purposes that are external to the change in knowledge, when the learning is a means to an end. Learners are intrinsically motivated when they learn because of a desire to know more about a set of ideas. Intrinsic motivation involves the integration of
two self-perceptions: perceived self-confidence and self-management and determination. If either or neither of these conditions are in the learning context, intrinsically motivated learning is less likely.

Linked with each type of motivation are goals that specify the types of learning outcomes to be targeted. Two types of achievement goals have been identified. Learning or mastery goals are linked with intrinsic motivation (Blumenfeld, 1992; Graham & Golan, 1991). These goals focus on learning more about a topic, improving understanding or competence, achieving a sense of mastery and developing self-referenced standards. Performance goals are linked with extrinsic motivation. These goals focus on social comparison standards, that is, 'doing better than others', learning so that outcomes can be displayed publicly.

This article uses the above set of factors to examine the learning characteristics of gifted students who have learning disabilities.

**LEARNING CHARACTERISTICS OF GLD STUDENTS**

To clarify who we are talking about, it is useful to examine some of the characteristics of this group, despite the obvious dangers, for example, charges of stereotyping, categorisation and inappropriate generalisation. Their characteristics include the following:

**Superior general intellectual ability**

These students display high intellectual potential in at least some knowledge and thinking domains (Brody & Mills, 1997). The multifaceted conceptualisations of intellectual ability such as the theory of multiple intelligences (Gardner, 1983, 1993) allow more readily the identification of high ability in some areas than the general "g" conceptualisations. They accommodate more easily the simultaneous occurrence of giftedness and a learning disability.

Performance in various domains of knowledge has been analysed to identify profiles of superior reasoning performance. Since the constructs of giftedness and learning disabilities are broadly defined and can present in a variety of areas, it is difficult to find a single pattern of subtest scores that could identify all gifted/LD students using a general ability assessment such as the WISC-III (McCoach, Kehle, Bray & Siegle, 2001). Profile analysis using the WISC III for these students have shown the following (Patchett & Stansfield, 1992):

- these students show larger discrepancies (that is, more than 15 points) between Verbal and Performance scores on the WISC-III than do students who demonstrate giftedness alone (McCoach, Kehle, Bray & Siegle, 2001).

- one group of students performs better on the Performance subscale (i.e. more than 15 points); they generally have strengths in abstract reasoning and visual skills (Brody & Mills, 1997). This is the most frequently reported profile, the 'gifted visual-spatial learners' (Silverman, 1989). They do best on tasks that involve solving spatial puzzles, tracing mazes, duplicating block designs, counting three-dimensional arrays of blocks, visual transformations, mental rotations, envisioning how a folded and cut piece of paper would appear opened up, and similar items. Indicators of this style include higher performance on:
  - the Block Design subtest of the Wechsler Intelligence Scale for Children (WISC)
  - Raven’s Progressive Matrices
  - Mental Rotations Test.

The visual thinking helps them to perceive the interrelatedness of the parts of a situation. Visualisation is a key element in their mental processing. Many have an eidetic visual memory; they can recall visually earlier sets of experiences. They may create visual models of reality that are multi-dimensional. Their knowledge allows them to learn complex ideas well and equips them to analyse and synthesise abstract patterns in original, creative ways.

- a second group shows strengths on WISC-III subtests that required verbal reasoning abilities and poorer performance on subtests that required attention, sequencing skills, handling and learning arbitrary information (McCoach, Kehle, Bray & Siegle, 2001). These students show high Comprehension and Similarities performance (Barton & Stann, 1988; Baum, Owen & Dixon, 1991; Ferri, Gregg & Heggoy, 1997; Fox, 1981; Schiff, Kaufman & Kaufman, 1981); they have extensive vocabularies, well-developed conceptual abilities and a large general knowledge (Little, 2001). They tend to show good listening comprehension and express themselves well (Hishinuma & Tadaki, 1996). They can reason abstractly and solve problems; many demonstrate a sophisticated sense of humour (Rivera, Murdock, & Sexton, 1995).

They perform more poorly on tasks that require using information in a particular sequence, retaining arbitrary information in order and manipulating symbolic information, for example, the Arithmetic, Digit Span and Coding subtests. Their performance is described as the CAD profile.

Some diagnosticians, for example, McCoach, Kehle and Bray (2001), argue against using WISC subtest scores to identify profiles. Their main objection is using combinations of the sub-tests to identify students as both gifted and learning disabled because of statistical properties of the sub-tests. However, while a particular profile may not represent a particular learning disability, Sattler (1988) notes that profiles can be used to 'point out strengths and weaknesses, and these patterns allow for the development of hypotheses that can contribute to an understanding of the child...The goal of profile analysis is not to classify or categorise children; rather it is find clues about their abilities' (p. 166).

The present paper recommends using profiles in this latter way.

Students in both groups show superior learning outcomes in outside of class areas. Their superior knowledge is in topics that are not necessarily taught at school. They may, for example, have an extreme knowledge of history, economics, technology or art, a knowledge that is
much greater than what is taught in their classes. They display a wide general knowledge and an extreme knowledge in areas of interest.

A global wholistic preference in thinking

Gifted learning disabled students are more likely to use global wholistic rather than analytic sequential learning strategies. They tend to learn wholistically, require a high level of task focusing and are sometimes distractible (Brody & Mills, 1997; Little, 2001). They are more likely to learn in an all-or-none fashion rather than in a stepwise incremental way, and to experience the "Aha!" intuitive thinking phenomenon. They use sequential thinking skills as a back-up system when they cannot grasp a concept by taking in the entire gestalt. Tasks on the WISC profile that examine sequential analytic processing include Picture Arrangement, Arithmetic, Coding and Span.

Learning for students using global strategies proceeds in larger increments in an intuitive way, rather than in the gradual accretion of smaller ideas. They learn in ways that differ from their peers. While their non-gifted peers learn by being programmed by their teaching and by internalising comparatively small units of information in a sequential way, these students learn by self-programming. They generate questions to guide their learning, rather than waiting to be programmed and engage in "fat transfer" of their knowledge. They learn a set of ideas, for example, a multiplication table, as a related set of ideas rather than each item independently. Rote memorization and encoding are not effective teaching procedures for these learners. They use inductive learning strategies well and engage in synthesis in thinking.

These students often have difficulty learning knowledge that is taught in a rule-based way, bit by bit in a sequence. Some areas of knowledge are taught in ways that assume that students learn by being programmed, for example, learning in areas of reading, spelling and numeracy. From the early years of formal education, students are required to learn the letter patterns that match spoken words, and how to read unfamiliar words by using what they know. To link spoken and written language, they need to develop spontaneously a knowledge of phonological sub-word units (McBride-Chang, Manis & Wagner, 1996).

Their underachievement in areas such as literacy and/or numeracy meets the criteria of learning disabilities: it (1) is restricted to a limited band of academic or cognitive achievement (specificity criterion), (2) is lower than what one might reasonably expect for the student (discrepancy criterion) and (3) cannot be attributed to other potentially handicapping causes (exclusion criterion) (Swanson, 1991). Up to one third of those in samples of learning disabled students have emerged as gifted (Baum, Emerick, Herman, & Dixon, 1989).

In literacy learning they have difficulty learning the written word forms. As a result, they have difficulty learning to read and a greater difficulty learning to spell. They learn spelling and maths better when these are taught through meaning than as rules.

The self-concepts of gifted students with learning disabilities. These students show comparatively poor self-concept, poor self-efficacy and high levels of frustration, anxiety, and self-criticism (Baldwin, 1999; Baum, Owen, & Dixon, 1991; Bireley, 1995; Higgins & Nielson, 1999; Hishinuma, 1993; Mendaglio, 1993; Olenchuk, 1994; Van Tassel-Baska, 1991). Their self-concepts are influenced by the type of teaching to which they had been exposed (Fetter, 2000), by the comparison peer group and by the expectations placed upon them by their school and their parents. Students exposed to teaching that recognised their giftedness, either alone or with their learning disabilities, reported higher self-concepts than those receiving services only for the learning disabilities (Baum et al., 1991; Johnson, Karnes, & Carr, 1997; Nielsen & Mortruff-Albert, 1989).

They frequently discriminate between their academic and out of school capacities and differentiate their self-concepts accordingly. Primary level gifted learning disabled students think positively of themselves in out-of-school contexts (Vespi & Yewchuk, 1991). Their repeated lack of success in academic tasks undermines their positive self-image in school.

These students frequently have diffused identities (Dole, 2000) and display ineffective coping strategies like crowning (Smith, 1991) or faking it (Druck, 1994; Lee & Jackson, 1992) to protect their self-esteem. Self-esteem suffers when a person's learning disabilities but not gifted traits are singled out. Their characteristic of perfectionism, discussed later, reduces their self-efficacy. Teachers perceive them to be more asocial, less popular, quieter, and less accepted by others than are gifted students (Waldron, Saphire, & Rosenblum, 1987).

Their self-esteem is increased by involvement in teaching that acknowledges their areas of strength and that takes account of their social and emotional needs (Higgins & Nielson, 1999; Korinek, 1992). Increased self esteem leads to an increase in motivation, persistence and an internal locus of control (Dole, 2000). Focusing on strengths and interests is a critical component in reversing underachievement (Baum, Renulli, Hebert, 1995; Emerick, 1992; Fehrenbach, 1993; Hebert, 1997).

Gifted students with learning disabilities have low resilience

Resilience refers to the protective factors which serve to buffer an individual's response to stressful life events (Cohler, 1987; Howard & Dryden, 1999; Keogh & Weins, 1993; Speckman, Herman, & Vogel, 1993). The protective factors allow some children to maintain self-concept and self-efficacy when faced with the same deterrents that lead others to give up (Rutter, 1987).

Gifted students with learning disabilities are often considered at risk because of their paradoxical coexistence of exceptional talent or ability in one or more areas, either realised or potential, and specific academic disabilities as a result of underlying processing deficits (Robinson, 1999). They show social-emotional characteristics that would increase their vulnerability, for example, hypersensitivity, emotional liability, and high levels of frustration, anxiety, and self-criticism (Baldwin, 1999; Baum, Owen, & Dixon, 1991; Bireley, 1995; Higgins & Nielson, 1999; Hishinuma, 1993; Mendaglio, 1993; Olenchuk, 1994).

Motivation to learn and learning style

While these students display a high level of extrinsic or self-motivation in areas of knowledge that are of interest, past reaction to their academic learning disability by teachers, peers, parents and themselves can lead to
poor motivation to learn in the academic areas. Although not targeting gifted learning disabled students directly, investigations by Miserandine (1996) have shown that students who display above average ability and who experience a lack of competence (that is, believe they have poorly developed abilities) or a lack of autonomy (that is, perceive themselves to be externally motivated) report more negative affect and withdrawal behaviors than did students who believed that they had ability and autonomy.

Both of these conditions apply to gifted learning disabled students. These students, like their gifted peers, display a higher internal locus of control than non-gifted students (McClelland, Yewchuk & Mulcahy, 1991). The motivation orientation that they know works best for them, that is, the self driven motivational style, clashes with the extrinsic motivational climate that is in place in most conventional teaching contexts. In part because they have difficulty orienting to the external motivation context and because their teachers see a level of academic potential, they are frequently identified as being lazy or lacking motivation in conventional learning contexts (Silverman, 1989).

These motivational outcomes are particularly likely in teaching situations in which the focus on both assessment and instruction is on the learning disability rather than on the areas of superior knowledge (McEachern & Bornot, 2001; Robinson, 1999). This can result in poor self-esteem, a lack of motivation, depression, and stress.

**Metacognition of gifted learning disabled students**

Gifted students generally display higher metacognition than average students in particular areas; they know better when to use metacognitive knowledge, how to monitor their strategy use (to evaluate and change strategy use as needed) and are more able to transfer strategies to situations distinct from those in which the strategy was learned, that is, far transfer (Carr, Alexander & Schwanenflugel, 1996). They do not display consistently better strategy use, maintenance, or near transfer (using strategies in situations similar to those in which the strategy was taught).

The few studies that have examined the metacognition of gifted learning disabled students have targeted the use of metacognition during reading. These readers displayed metacognitive strategy use, for example, engagement in comprehension monitoring, more like that of their gifted peers than their average learning peers (Hannah & Shore, 1993). The finding is interpreted as suggesting that these pupils be seen as gifted, even through they have low academic achievement.

Another study examined the use of metacognition during reading of four gifted learning disabled students (McGuire & Yewchuk, 1996). In terms of comprehension monitoring, the readers used evaluation strategies in ways similar to skilled readers but with less efficiency in detecting the errors. They differed in their use of 'while reading' strategies such as visualising and paraphrasing and planning strategies.

**The motivation orientation that they know works best for them, that is, the self driven motivational style, clashes with the extrinsic motivational climate that is in place in most conventional teaching contexts.**

These studies note the need for further analysis of the use of metacognition by gifted learning disabled students. These students show that they do use metacognition, but the extent to which this use is domain-specific, that is, linked to particular areas of knowledge, has not been resolved. It is possible, for example, that these students may display higher metacognitive proficiency for areas of knowledge in which they are more proficient. These would not be the academic areas of knowledge in which they display literacy disabilities. It is possible that the students in McGuire & Yewchuk's study were less efficient in detecting errors because their learning disability restricted their ability to read words efficiently. While their metacognitive knowledge may have been adequate, their knowledge of print units may have restricted their reading.

An issue that needs to be targeted is the nature of the metacognitive self statements that these students use. The tendency these students display towards more global and holistic thinking may be due in part to the self talk that they employ. Instead of telling themselves to analyze and sequence information, their self talk may direct their attention to more global aspects. To transfer spontaneously what they know about some words to read unfamiliar words, for example, students need to implement metacognitive cueing. Studies that compare their metacognitive self talk with that of their more successful peers are necessary.

A second issue relates to the extent to which students, whose knowledge of a topic is initially in a form that doesn't match the text, is recoded to a verbal form. This is important for those students who display the 'gifted visual-spatial learners' profile. Metacognitive strategies can be used to recode imagery knowledge to a verbal form.

**Difficulty showing what they know**

Successful academic performance involves students displaying their knowledge in conventional ways, for example, by reading, writing and completing other types of regular tasks. They do this by answering the questions teachers ask and by writing responses to questions on tests. The ability to display one's knowledge in these ways requires students to 'learn the language' for this display. This language is learnt by implementing the particular processes in which these students are deficient.

Because these students may have difficulty reading and writing, they have difficulty showing what they know. In most school situations, students need to show what they know in literacy-oriented ways. For some, their knowledge of a topic may be in nonverbal or imagery forms rather than programmed in literacy-type ways.

Because they are less able to show their knowledge in these ways, they get less positive feedback for what they know. As well, they learn less about how to 'read' assessment contexts and to learn how to align what they know with assessment tasks. They may not receive positive feedback from teachers or peers and begin to lose confidence in what they know. They also may become alienated from formal
Uneven rates of development

A concept that frequently arises in relation to gifted learning generally is that of 'asynchronous development'. This concept integrates psychological and emotional factors and is defined as follows:

'Giftedness is asynchronous development in which advanced cognitive abilities and heightened intensity combine to create inner experiences and awareness that are qualitatively different from the norm ... The uniqueness of the gifted renders them particularly vulnerable and requires modifications in parenting, teaching and counselling in order for them to develop optimally' (Morelock, 1996, p. 4).

The concept has been used to draw attention to the emotional vulnerability of gifted children as a result (Silverman, 1997, 1998) when mental and chronological development are not synchronised, children can find themselves in situations where they can intellectually process information at a more advanced level than their age peers. This difference can lead to difficulties with social relations and self-esteem if classmates react negatively.

Peer feedback frequently plays a critical role in learning. Peer acceptance is an important influence. Satisfactory peer group interactions provide an on-going reference point for what is 'normal'. Students who experience the asynchrony may become aware that they differ substantially from their peers. With increased ability to reflect on consequences and possibilities, they may worry about the implications of these differences. Their awareness that they differ may lead them to experience self-doubt, to reflect on 'what is wrong with me' and to develop feelings of isolation. Silverman (1998) describes the problem of a "... vulnerable self, besieged by emotionally charged cognitions, that struggles to find a place in the world ..." (p. 205). A possible consequence of asynchronous development is that gifted children feel abnormal in their social environments resulting in identity confusion. This will be displayed in anxiety, anger, depression, loneliness, resignation and withdrawal from regular teaching contexts (Greenspon, 2000).

The concept of asynchronous development is important for gifted learning disabled students. These students are frequently aware that they think differently from their peers and that they can see implications and solve problems faster and more effectively than their peers but at the same time cannot learn the academic knowledge that their peers generally seem to learn with comparative ease. They may, for example, understand at an advanced level the ideas in texts that their class reads, but have difficulty learning to read the words. They may know the answers to comprehension questions but may receive negative peer or teacher feedback for having difficulty spelling the words. Their poor handwriting may be more important to their teachers than the rich knowledge they have.

These learners frequently attempt a number of alternative pathways to fit in with others and be acceptable to one's peer group. If these are not successful, they may display a range of dysfunctional behaviours, for example, become behaviour management problems (Druck, 1994; Lee & Jackson, 1992; Smith, 1991) or withdraw from learning. They are described by their teachers as lazy, unmotivated, disinterested, not prepared to use what they know and not disposed to learning when exposed to regular instruction or as eccentric or paradoxical, not fitting into usual categories of students (Hishinuma & Tadaki, 1996; Rivera, Murdock, & Sexton, 1995). They may become peer group outcasts, giving themselves little opportunity to learn in an on-going way the necessary social interaction skills.

High (often unrealistic) standards and goals

These students often set unrealistically high standards and goals for themselves and are 'perfectionists'. Their high expectations and low achievement in academic subjects can lead to a fear of failure and avoidance of subjects in which they do not achieve a high level of success (Vespi & Yewchuk, 1991).

They are less likely to be programmed than their peers, are less engaged to engage in trial and error learning, or to learn gradually in small steps at a time. Instead they try to learn 'the whole idea' at once. This, of course, clashes with the way the teacher is teaching it (that is, in small sequential steps).

Interpersonal interactions

The importance of positive interpersonal interactions for successful learning progress and the opportunity to learn these in an on-going way, have already been noted. These students frequently have poor peer relationships and low self-esteem (Robinson, 1999); although they may have good social skills in their repertoire, their inconsistent use of them results in few and poor peer relationships (Vespi & Yewchuk, 1991).

Confusion about their mix of special abilities and deficits frequently leads to feelings of frustration, unhappiness, and isolation (Norton, 1996; Silverman, 1989). These feelings can lead in turn to anger and resentment towards others, which may affect their interactions and relationships with peers and family members (Mendaglio, 1993). When these feelings are linked with their more global approach to learning, they are more likely to leading to procrastination, withdrawal, and lack of impulse control at home and in school (Van Tassel Baska, 1991).

EXPLAINING GIFTED LEARNING DISABILITIES

Students who are both gifted and learning disabled have co-existing superior knowledge and specific areas of immature knowledge. Those with literacy learning disabilities, for example, often have difficulty learning the foundation letter clusters that allow them to read and write effectively. This restricts their ability to learn by reading and by writing and to show what they know.

This difficulty has been attributed to processing difficulties in various areas. Key cognitive processes necessary for literacy learning include phonological and phonemic processing, orthographic processing, the rapid retrieval of names from long term memory and the retention of phonological knowledge in short term memory.

The balance between areas of superior and restricted knowledge and associated beliefs about how to learn,
self-efficacy and self-concept, influences subsequent learning. As we have noted, these students display superior achievement and self-concept in areas outside of school.

THE IDENTIFICATION OF STUDENTS WHO DISPLAY THE DUAL EXCEPTIONALITIES

In practice it is difficult to identify students who are both gifted and learning disabled (Byrd & Mills, 1997; Fetzer, 2000; Little, 2001). Three groups tend to go unidentified:

- those identified as being gifted, but with difficulties with elements of their school work. They are often considered to be underachievers and their learning disabilities tend to remain unidentified;
- those whose learning disabilities are severe enough to have been recognised, but their gifted abilities are not addressed;
- those whose abilities and disabilities mask each other. Such students are generally considered to have average abilities because they typically function at grade level (McCoy, Kehle, Bray & Siegle, 2001).

Members of these groups are not identified as either gifted or learning disabled (Fetzer, 2000). The assessment and identification process needs to recognise the possibility of these types of masking. Those at the primary level can often compensate for their disability (Norton, 1996). They have only one teacher who gives them the opportunity to learn and show what they know in a range of ways. Much of the content they learn is available in the larger world. In secondary school, where knowledge becomes more specialised, it is more difficult to display knowledge in advance of the classroom. These students may begin to show a difficulty learning (Tallent-Runnels & Sigler, 1995). The assessment needs to be aware of this and attempt to detect this compensation.

This paper has already indicated the importance of identifying and addressing both strengths and weaknesses. Professionals involved in the assessment of students need to be skilled in identifying and developing both strengths and learning disabilities.

The identification process needs to gather evidence of giftedness. This involves collecting data in a range of areas including evidence of:

- superior cognitive or reasoning ability;
- academic aptitude, probably in areas outside of school;
- creative or productive thinking and thinking in areas of interest;
- superior achievement in areas outside of school;
- high level of intrinsic motivation to learn in areas of interest.

It also involves gathering evidence of a learning disability, that the student displays comparatively low achievement in one or more areas of academic learning. In other words, there are significant discrepancies between what one might reasonably expect of the student and the actual performance (Fetzer, 2000).

McCoy et al. (2001) note some of the pragmatic and conceptual issues that arise in terms of the discrepancy condition. For students who are gifted, it is possible that average performance in the academic areas would indicate a significant discrepancy, since this level of performance would be well below the expected level of achievement. The criterion of average performance in literacy or mathematics does not usually qualify as an indication of a learning disability.

It was noted earlier that one aspect of identifying a learning disability involves evidence of a processing deficit (Brody & Mills, 1997). The diagnostician can analyse aspects of the gifted students' performance to investigate possible cognitive causes of the learning disability. Knowledge of the possible causes of learning disabilities facilitates identification of the processing deficit for any student.

The identification and diagnostic process will be successful if students are prepared to display their knowledge. The assessment of gifted learning disabled students is often problematic because the students are often encouraged to perform at a high level. The examiner must gain an impression of what the reader could have comprehended if able to read the words automatically.

Some gifted readers have a strong imagery preference. They may have difficulty comprehending text because they cannot visualise the possible topic of the text and then to talk in sentences about what they 'see in their mind's eye' when they hear the topic. By recording their imagery knowledge into sentences, they can link the text with what they know and reason about it at a high level. The examiner can gain an impression of what the reader could have comprehended if able to express it in verbal form.

Using dynamic assessment to identify gifted learning disabled students

A key approach to identification is the use of dynamic assessment/interactive evaluation. This approach assesses an individual's knowledge in an area while supporting or 'scaffolding' the person's knowledge in other areas. The examiner assists the learner to do assessment tasks and notes the conditions under which the learner's ability to display knowledge is facilitated.

Suppose, for example, a gifted student has a specific learning disability reading words. The student may have difficulty comprehending text because he or she cannot read automatically many of its words. To investigate this possibility, the examiner may teach the particular text words likely to cause difficulty before the reading begins or tell the student what the difficult words are and suggest that the reader uses regular re-reading. This helps the examiner gain an impression of what the reader could have comprehended if able to read the words automatically.

Some gifted readers have a strong imagery preference. They may have difficulty comprehending text because they cannot link the verbal text information with their rich imagery knowledge. To investigate this possibility, the examiner may remind them to visualise the possible topic of the text and then to talk in sentences about what they 'see in their mind's eye' when they hear the topic. By recording their imagery knowledge into sentences, they can link the text with what they know and reason about it at a high level. The examiner can gain an impression of what the reader could have comprehended if he had his knowledge stored in verbal form.
These examples show how an examiner can note the conditions under which a reader's comprehension improves and can probe to examine whether the student can display behaviours characteristic of giftedness when the influence of the learning disability is reduced through external supportive scaffolding. The scaffolding is a form of "guided assistance" (Abbott, Reed, Abbott & Berninger, 1997, p.249).

A learner's performance can be described in terms of the number of graduated hints or prompts required to complete a task (Brown, 1994; Lidz, 1991). The nature of the assistance can be classified as either near or far transfer. Near transfer refers to familiar tasks presented in different combinations, while far transfer relates to solving problems different from the original (Jitendra & Kameenui, 1993).

Dynamic assessment procedures have been used with students having difficulties with reading comprehension (Brown, 1994; Brozo, 1990; Klettizen & Bender; 1990) and with word attack skills (Spector, 1992). The scaffolding assists in understanding reading difficulties (Abbott et al., 1997) and in identifying differences in the cognitive processing of learning disabled students (Swanson, 1994).

This approach allows the assessor to examine the ways in which the learner prefers to process information. The assessor assists the learner to hold information that might otherwise be difficult to process. A key issue to examine in the scaffolding process for the identification of giftedness is the extent to which the student, during scaffolding can (1) learn new ideas and (2) engage in far transfer.

**Assessing general ability**

Standardised intelligence tests, such as the WISC-III, are used to investigate evidence of a general intellectual ability or a specific talent in any of a variety of areas (Brody & Mills, 1997). As noted earlier, some GLD students show well developed knowledge, characterised by extensive vocabularies, conceptual and verbal reasoning abilities (Little, 2001). The general ability profiles of these students may show larger discrepancies between the Verbal and Performance scores than for other gifted students:

- one profile shows higher performance in the Performance area (i.e. more than 15 points;
- they generally have strengths in abstract reasoning and visual skills; the 'gifted visual-spatial learners' (Silverman, 1989).

A second profile shows lower performance on subtests that required attention, sequencing skills and learning arbitrary information (McCoach, Kehle, Bray & Siegle, 2001).

To investigate tendencies to learn and to think holistically or globally rather than in analytic sequential ways, one can compare performance on tasks on the WISC-III that require attention, concentration and sequencing skills, such as Picture Arrangement, Arithmetic, Digit Span and Coding with more global tasks.

**Assessment of creativity and divergent thinking**

Intelligence measures such as the WISC-III are insufficient to examine the creative, aptitude and achievement aspects of giftedness, (Fenster, 2000; McCoach, Kehle, Bray & Siegle, 2001); assessment protocols need to include creativity tests, behavioural observations, teacher nominations and structured interviews (Brody & Mills, 1997) to identify evidence of an outstanding ability or talent in topics that are not necessarily taught at school.

Instances of creativity and divergent thinking will be displayed in students' creative writing, art, contributions to group projects and problem solving. The level of creativity in students' outputs can be determined by examining the extent to which they show evidence of (1) 'far transfer', the inclusion of ideas that are relevant but unexpected, not typical of class peers, (2) novel ideas, (3) unusual but interesting interpretations or (4) a contribution that significantly moved a problem, outcome or a discussion. Being able to examine achievement over time is a help.

**Assessment of learning disability**

It can be ascertained whether the student displays comparatively low achievement in one or more areas of academic learning by administering relevant achievement tests, for example, tests of reading comprehension, spelling or mathematics. This can be checked statistically using appropriate norm referenced achievement tests to analyse the extent to which the discrepancies in performance are significant (Fenster, 2000).

In interpreting a discrepancy between intellectual ability and achievement, educators need to keep in mind that a learning disability can depress achievement and cognitive test scores (Fenster, Gregg & Heggott, 1997). Standardised achievement test scores may decrease with increase in grade, for example, as a literacy learning disability exerts increasingly more influence on a student's ability to learn by reading and writing. Monitoring achievement and performance longitudinally can assist in screening here.

The learning disability is assumed to be due to processing deficit in a relevant area of cognitive processing. This can be identified by examining the underlying processes that cause literacy learning disabilities: a students' phonological and phonemic processing, naming and retrieval processes, psycholinguistic processing, metacognitive control, comprehension monitoring and orthographic processing. Identifying possible processing causes of academic underachievement assists in defining a learning disability for any student. Analysis of the specific areas in which a student has difficulty reading, particular word reading patterns, rate memorisation and organisation processing, patterns in reading comprehension can assist. Dynamic assessment procedures are invaluable here in identifying the conditions under which a student can improve performance.

**Assessment of specific aptitude in particular areas**

The students who are the focus of this article often have aptitude in areas other than the traditional academic ones and alternative sets of indicative aptitude behaviours may be necessary. The student's strengths may be shown in interests, hobbies and performance in other academic areas (Fenster, 2000). Behavioural observations, student presentations, teacher nominations and structured interviews can be used to identify evidence of an outstanding ability or talent in topics that are not necessarily taught at school (Brody & Mills, 1997).

**Assessment of high level of intrinsic motivation to learn**

Behavioural observations, questionnaires, and structured
interviews with the children and parents can be used to investigate the extent to which students show a comparatively high level of intrinsic motivation and are 'self driven to learn more' about topics and issues that interest them.

**Assessment of self-concepts of gifted students with learning disabilities**

Educators can use behavioural observations, questionnaires and structured interviews with the children and parents to assess students' self-concept, self-efficacy and level of frustration and anxiety for learning both in and out of school. Monitoring these over a period of time allows one to form a more accurate impression of students' beliefs in these areas. As well, dynamic assessment procedures provide the tools for identifying the conditions under which beliefs about self-perfection change, for example, when their beliefs about the task are modified to value more their giftedness. One may decide to assess and monitor students' resilience.

**Assessment of metacognition and self-management of learning**

The use of metacognitive strategies can be assessed by having students 'think aloud' before they begin to work through tasks and as they do so. Diagnosticians can also use questionnaires and structured interviews to ask students to comment on what they believe they do when they learn.

Dynamic assessment procedures indicate how students use metacognition when aspects of their knowledge is scaffolded. Many students who have learning disabilities are less likely to use metacognitive processes spontaneously and need to be cued to use them. They are described as 'non-strategic' or as 'passive learners'. The spontaneous use of these strategies is linked with students' self-efficacy and beliefs about the worth of the task. Modifying the conditions under which they complete a task and increasing the likelihood of successful task completion allows one to monitor whether the use of metacognitive strategies increases.

Educators can also examine whether students use metacognitive strategies more effectively when they are learning about topics in which they have an interest and a superior knowledge. It may be possible to identify the conditions under which you can facilitate transfer of metacognitive knowledge to the areas of academic learning.

**Assessment of the ability to show what is known**

With gifted learning disabled students, difficulties showing what is known restricts the ability to display knowledge. These difficulties include being able to comprehend task requirements, being only able to align one's knowledge with the task demands and being able to spell and to write effectively. The assessment examination extent to which this affects the performance and learning of individual students. Students can be given alternative ways of showing what they know about a topic. To assess some tasks they can be allowed to select the preferred mode for doing this.

**Taking account of uneven rates of development**

The behaviours that are frequently targeted in classroom instructions and that are noted by teachers and diagnosticians are usually those to do with immaturity or unacceptability. The assessment needs to indicate the possibility of asynchronous development and attempt to account for it. It also needs to collate a complete picture that includes what a student does do and know, as well as areas in which the student shows immaturity. It is important that the student knows that this is a goal of the information gathering.

The concept of asynchronous development is also important in terms of differentiated development of areas of knowledge. 'Uneven development and learning is more likely from these students than from others. One would, for example, be less justified in assuming that because these students could perform particular skills that they could also perform related skills.

**CONCLUSION**

GLD students are perplexing to their teachers. The differentiated models of giftedness and talent proposed by Gagne (2000) and Perleth and Heller (1994) provide a framework for understanding their learning; they are gifted but do not acquire adequate academic knowledge as a result of education. The models also suggest directions for identification: educators need to identify both the areas of knowledge and ways of learning these students do have in place and the areas in which their learning difficulty might arise.

The present article explains this in terms of a lack of the specific learning capacities needed to acquire academic knowledge. Their natural abilities and knowledge either (1) do not scaffold academic learning (the gifted visual-spatial learners whose Performance scores on the WISC is in the superior range) or (2) include superior verbal reasoning abilities and poorer performance on subtests that required attention, sequencing skills, handling and learning arbitrary information. They display a general learning capacity that is characteristic of students who are gifted, in parallel with academic performance that is often substantially below what would be expected based on their intellectual ability. Their giftedness is masked by comparatively low levels of academic achievement.

These students are more likely to use wholistic or synthetic-global strategies than analytic-sequential strategies to learn. This restricts their ability to learn in contexts that involve 'being programmed' by the teaching, by internalising comparatively small units of information in a sequential way and by learning rules taught without access to meaning.

As a consequence of poor academic achievement, these students show comparatively poor self-concept and poor self-efficacy. Their self-concepts are influenced by the teaching to which they have been exposed. Those with access to teaching that recognise their giftedness, either alone or with their learning disabilities, report higher self-concepts than those receiving services only for the learning disabilities. Although they may display a high level of self-motivation in areas of knowledge that interest them, they show poor motivation to learn in the academic areas.

The identification process for these students involves gathering evidence of giftedness and learning disabilities. Their giftedness is identified by identifying (1) superior cognitive or reasoning ability (2) academic aptitude, probably in areas outside of school, (3) creative or productive thinking and thinking in areas of interest (4) superior