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DUAL DIFFERENTIATION: AN APPROACH FOR MEETING THE CURRICULAR NEEDS OF GIFTED STUDENTS WITH LEARNING DISABILITIES

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Gifted students who experience difficulty with reading, mathematics, spelling, handwriting, and organization frequently become frustrated at an early age. Well-intentioned teachers attempt to remediate their weaknesses; yet, these youngsters still feel alone in the classroom. Moreover, their academic limitations often mask enormous talent, which seldom has an opportunity to surface. Thus, gifted learning-disabled students require curriculum that develops their special talents and provides them strategies to compensate for problematic weaknesses. This article discusses the dual characteristics of gifted learning-disabled students and suggests a unique curriculum that integrates both through talent development. Developed through *Project HIGH HOPES*, funded federally by the Javits Act (1993–1996), this dually differentiated curriculum offers strategies for addressing students' learning problems while fulfilling their need for sophisticated challenge through advanced-level content and a focus on solving authentic, real-world problems. © 2001 John Wiley & Sons, Inc.

Gifted learners frequently neglected in our nation's schools are those with concomitant learning and attention disabilities. Because they exhibit learning problems due to physical, cognitive, or behavioral deficits, these students seldom achieve at the level of which they are capable. Remedial efforts may even remove these students from their mainstream educational settings and place them in special classes or special schools with limited, if any, access to existing gifted education programs. Traditionally, even under the most conservative definitions of giftedness, gifted students are seriously underidentified among the population of disabled students. Balancing their special needs with their gifted characteristics presents a formidable challenge to even the most talented learning-disabled student. The studies investigating the duality of learning needs and resulting programmatic interventions suggest the importance of providing these students with a curriculum that both accommodates their gifts and talents and simultaneously allows the students to compensate for problematic weaknesses (Baum, 1988; Baum & Owen, 1988; Baldwin & Gargiulo, 1983; Olenchak, 1994; Whitmore & Maker, 1985).

Finding a challenge in the issue of appropriate education for students who are both gifted and learning disabled, the National Association for Gifted Children (NAGC) (1998) developed a position paper, "Students With Concomitant Gifts And Learning Disabilities." This paper stresses the need to address both the gift and disability of these special youngsters.

Due to a specific learning disability, an increasing number of students are not achieving up to their potential despite the fact that they demonstrate high ability or gifted behavior. These students exhibit characteristics of both exceptionalities: giftedness and learning disabilities. Their gifted behaviors often include keen interests, high levels of creativity, superior abilities

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in abstract thinking, and problem-solving prowess. Similar to their peers with learning disabilities, they frequently display problems in one or more of the following: reading, writing, mathematics, memory, organization, or sustaining attention. Because of their dual set of seemingly contradictory characteristics, gifted learning-disabled students may develop feelings of depression and inadequacy and consequently may demonstrate acting-out behaviors to disguise their feelings of low self-esteem and diminished academic self-efficacy Students who have both gifts and learning disabilities require a dually differentiated program: one that nurtures their gifts and talents while accommodating for learning weaknesses. Being dually classified is often key to students' receiving appropriate services. A comprehensive program will include: provisions for the identification and the development of talent; a learning environment that values diversity and individual talents in all domains; educational support that develops compensatory strategies including the appropriate use of technology; and school-based counseling to enhance students' ability to cope with their mix of talents and disabilities. Without appropriate identification and services, the gifts of these students may never be developed. (NAGC, 1998)

A GLIMPSE AT FOUR GIFTED LEARNING-DISABLED STUDENTS

Debby (Grade 4)

Debby cringed every time her teacher uttered the following words, "Take out your reading books, class." She felt humiliated when she couldn't perform as well as her classmates even when the teacher didn't call on her. Debby had severe reading and writing difficulties and had been identified as having learning disabilities in first grade. Even though she had received remedial support since first grade, her progress was dreadfully slow. As a result, her self-esteem was poor (she'd scored at the third percentile on a Piers-Harris Children's Self-Concept Scales-Revised, 1984). Debby's teacher described her as defiant, distrustful, and easily hurt. Debby lacked confidence, concentration, and independence when approaching school tasks. Due to her negativity she had difficulty making and keeping friends. In truth, with each passing day her emotional well-being withered.

In fourth grade Debby was identified as gifted. Her superior ability on the Wechsler Intelligence Scale for Children-Revised (WISC-R) (Wechsler, 1974) and her advanced knowledge on world issues such as hunger, child abuse, and pollution provided evidence of her high potential. In addition, Debby had a talent in drama, and spoke passionately about her concerns. She was selected to participate in a special enrichment program where she conducted historical research on life during the colonial period. Using the methods of the historian, Debby triangulated her data collected through interviews, examination of artifacts, and documents. She then developed a slide-tape show entitled, "A Day in the Life of Jerusha Webster (Noah's Younger Sister)" to present her findings. Her slide-tape show is currently shown to other youngsters who visit the Noah Webster House, an historical landmark in Connecticut. Completion of this 10-week project transformed Debby into a confident, independent young learner. With her newly gained self-respect, she was able to relate better to her peers. Her reading and writing also improved because of her heightened perceptions of her own abilities and talents.

Tim (Grade 7)

When Tim entered school, he seemed driven by his curiosity. His parents and teachers described him as active with a need for challenge. Tim was also very bright, and was recommended for the gifted and talented program. The older he became, however, the greater his need for movement, and his constant activity interfered with his ability to achieve. Tim's frustration with having to sit passively for long periods of time resulted in emotional outbursts, and the school began to regard

him as a behavior problem. By the sixth grade, his poor handwriting and his general lack of maturity led to a referral for a complete psycho-educational evaluation. The discrepancy between and among categories on the WISC-R showed that Tim did, in fact, qualify as learning disabled (LD) with specific problems in written expression.

Tim's early interest in science, on the other hand, deepened over the years. His aptitude for science and love of experimentation led to his pursuit of science activities. He conducted a science fair experiment on squash seed growth that was recommended for competition on the regional level for elementary schools. His careful use of controls and variables on 64 squash plants surprised his classroom teachers. Tim continued this project with a follow-up study of squash plant growth, a sophisticated, interest-based independent research project that received high evaluations at the school project fair. After these successes, his teachers regarded him as a scientist, and raised their expectations for what he was able to accomplish. The realization that Tim could be both learning disabled and gifted alerted them to the importance of addressing the two paradoxical sets of needs that defined him as a learner.

Darrell (Grade 5)

Darrell, an African American attending an inner city school, was struggling in fifth grade. When he was able to talk about what he knew, he seemed so bright. However, putting his ideas in writing was problematic for this 11-year-old. Classified with a learning disability, Darrell reported to the LD resource room one period a day where he received remedial instruction in both reading and writing. When he arrived for this special assistance, he was often angry and negative, complaining to his resource teacher that school was not fun and that he was bored. Consequently, Darrell invested little energy in the tasks the teacher created to help him overcome his academic difficulties.

The resource teacher did notice, however, that Darrell was very different when she involved him in the visual arts. He became completely engaged when looking at paintings, photographs, or slides. His observations were superior to those made by classmates. Darrell noticed subtleties, inferred causality, and interpreted meaning in abstract ways. His advanced-level knowledge encouraged the teacher to use the arts as a means for stimulating thinking and verbalization. When his fifth-grade teacher had asked him to write an opinion of the 1991 war in the Middle East, he had produced the following four-sentence paragraph: "There is a war in Iraq. Sadamm Hossane is the ruler and is trying to kill the Kuwaitees. The US is helping the Kowaitees. I hope we win the war which is not fair." (spelling in the original)

This piece of writing showed little originality or abstract thought—qualities that could be observed in both his oral communication and art work. Moreover, his poor spelling and syntax, simplistic vocabulary, and uncoordinated handwriting counteracted other evidence of this young man's gifts and talents. When the resource teacher looked at Darrell's essay, she remarked to him that some adults make statements through political cartoons. She then shared some with him, and noticed his fascination with them. After studying these cartoons, Darrell created a political cartoon about the war. His abstract thinking ability was strongly evidenced in the metaphor he used of a flame-throwing dragon to represent Saddam Hussein. The firepower of this monster was aimed directly at the Kuwaitis, represented in the cartoon as a tiny victim. Even though the planes and tanks from the allied forces were represented in his cartoon, Darrell's grave concern about the allies' chance for victory was concisely expressed in his caption, "Will we slay the dragon?" In contrast with Darrell's earlier attempt to convey his opinion in writing, the caption and cartoon illustrated his thorough understanding of the concept being discussed.

Observing that this student was gifted in spatial intelligence rather than verbal (Gardner, 1983) provided important clues to the teacher as to how to approach writing with this youngster in

the future. The use of visualization or storyboarding as advance organizers would provide the context he needed to generate ideas and organize his thoughts before writing.

Mark (Grade 9)

The tall, quiet student who usually sits in the back of the classroom is Mark. His mother, a classroom teacher, became concerned about Mark's lack of progress in reading in second grade. Whereas his classmates could recognize words by sight and could read orally with fluency, Mark could not. He labored over sounding out every word and, consequently, comprehended very little of the written text. Testing revealed problems with short-term memory as well as with fine motor skills. Mark was identified as learning disabled and received remediation specifically in the areas of basic reading skills and written expression. But Mark's reading progress was both labored and limited; interested in athletics, he never considered school to be "his thing." He chose friends who had similar interests and attitudes toward school, and like Mark, they made good enough grades to get by but tended to avoid reading at all costs.

Although Mark does not read very much, he can visualize how an engine works by looking at it. He can transfer drawings and sketches into a working model. We first met Mark when he participated in a talent discovery class designed to spot aptitude for engineering and design. The students were asked to create a wooden vehicle that would be able to travel a measurable distance but powered by only an elastic band. Mark's assembled vehicle traveled more than 38 feet, a distance reached by no other student in the group. When it comes to engineering, Mark is gifted. Interestingly, his full scale IQ score of 125 would have qualified him for many schools' gifted and talented programs, but because of his identification as learning disabled, he was never recommended for this special service.

THE DILEMMA

These vignettes reveal the dilemma faced daily by students with problems in reading and writing but who are gifted in nonverbal areas. Although these students are able to learn complex information, to think abstractly, to engage in authentic problem solving, and to create original products to communicate their ideas, their development may be thwarted in the traditional elementary school setting. Because the emphasis during the elementary years is on basic skills in reading, writing, and math, all content areas are used to apply these basic skills. In short, much of the curriculum is a secret language arts lesson. For instance, in science, students often read about a topic and write in a student science journal about what they have learned from the reading or from a teacher demonstration and class discussion. First-hand inquiry is the exception, not the rule.

Note that the students described above learned best when involved in authentic learning, i.e., using the methods of the practicing professional. Debby became an actual historian to learn about life in colonial times and used her acting ability to communicate what she knew. Tim conducted a long-term experiment to learn about plant growth. He shared his knowledge through graphs and diagrams. Darrell communicated his opinion artistically by designing a political cartoon. Mark transformed engineering concepts into a three-dimensional model to show his understanding of the interaction between force and motion. In all four cases, these students were able to accomplish complex tasks by circumventing their poor skills in reading and writing.

Switching the focus away from these problematic areas for a time empowered the students to use other intelligences to solve problems and create products. As a result, their successes on tasks more complex than those typically used in remedial lessons boosted the students' self-efficacy and perception of their abilities as learners. In other words, accommodating the needs the students had as gifted learners helped them to compensate for their learning difficulties. In addition, observing

these students in the process of succeeding provided teachers with clues as to how these students learned best. But, most important, is that once students regard themselves as competent learners, they often improve in reading and writing (Baum, 1988; Baum, Neu, & Cooper, 1997; Baum, Renzulli, & Hébert, 1995).

How do teachers develop educational experiences that respect the abilities of these students while helping them overcome their learning problems? Doing so entails understanding the duality of their needs, finding appropriate instructional strategies to accommodate these needs, and developing problem-based curricula that allow for the expression of individual talents and interests. The description of the dually differentiated curriculum developed during Project HIGH HOPES addresses these concerns.

Project High Hopes was a three year program which identified talents in engineering, science, performing arts, and visual arts in students with learning and behavior difficulties. The program's goal was to nurture the talents identified and create a curriculum which accommodated both their needs as gifted learners and those associated with their disability. To meet this goal the dual differentiated curriculum described below was created.

DUAL DIFFERENTIATION: WHICH PROBLEMS DOES IT ADDRESS?

Students like Debby, Tim, Darrell, and Mark require a challenging curriculum that considers the unique duality that each student represents—a strange mix of advanced abilities and academic limitations. Designing these kinds of learning experiences depends on creating dual differentiation (Neu, 1996). The term refers to meeting the needs of students who exhibit two contradictory sets of learning characteristics by creating a balance between nurturing strengths and compensating for learning deficits.

Duality of Learning Characteristics

The characteristics of gifted students are well documented in the literature (Renzulli, 1978; Tannenbaum, 1983; VanTassel-Baska, 1992; Whitmore, 1980). They include the following: a propensity for advanced-level content, a desire to create original products, a facility with and enjoyment of abstract concepts, nonlinear learning styles, task commitment in areas of talent and interest, an identification with others of similar talents and interests, and a heightened sensitivity to failure or injustice. These traits may be offset or complicated by deficits typically impeding the success of students with learning disabilities. The most commonly reported problems include poor reading and math skills, problems in spelling and handwriting, difficulties with expressive language, lack of organizational skills, inability to focus and sustain attention, limited capacity for social interaction, and poor self-efficacy and esteem (P. L. 94–142, 1981; Reis, Neu, & McGuire, 1995).

Because of the concern with the students' disabilities, particular strengths and talents of gifted students with learning disabilities are often ignored by well-intentioned teachers and specialists. The belief that these students' deficits must be remediated before any attention can be given to their abilities and interests often results in little or no attention to the students' gifts or talents. In short, because the remediation techniques used lack the very characteristics gifted students require for successful learning, many remedial attempts are unsuccessful (Baum, Owen, & Dixon, 1991). The key, however, is, first, to use instructional strategies that accommodate both sets of characteristics to create the appropriate balance between attention to strengths and compensating for weaknesses and, then, to infuse these strategies into authentic, challenging curriculum.

In Table 1 we display the paradoxical needs of these students and how to make curricular modifications for them that attend to both their learning difficulties and their learning needs as gifted students.

Table 1
Fundamentals of the Dually-Differentiated Curriculum

Problems associated with special-needs students	Characteristics of gifted students	Curricular accommodations
Limited skills in reading and math	Propensity for advanced-level content to accommodate the gift or talent	Alternate means to access information
Difficulty with spelling and handwriting	Need to communicate creative ideas and knowledge	Alternate ways to express ideas and create products
Language deficits in verbal communication and conceptualization	Facility with and enjoyment of abstract concepts	Visual and kinesthetic experiences to convey abstract ideas concretely
Poor organization	Often demonstrate creative nonlinear styles of thinking and learning	Visual organization schemes, e.g., time lines, flow charts, webbing
Problems with sustaining attention and focus	Need for intellectual challenges based on individual talents and interests	Interest-based authentic curriculum
Inappropriate social interaction	Need to identify with others of similar talents and interests	Group identity based on talent or ability
Low self-efficacy and esteem	Heightened sensitivity to failure	Recognition for accomplishment

Limited Skills in Reading and Math

According to the definition in P. L. 94–142, many students with learning disabilities experience difficulties in reading and/or mathematics (Baum et al., 1991). With such a pervasive emphasis on reading skills in the academic setting, these students find their specific disability a serious hindrance to progress in subject areas treated as an extension of reading. Studies of instructional practices in the sciences, for instance, note classroom teachers' overdependence on students' reading the text (Coble, 1988; Scruggs & Mastropieri, 1989). The choice of this instructional strategy has, in fact, predetermined that the student with LD will lose an appreciable amount of content information. Thus, the student with LD either will have to work harder to achieve than will his or her reading peers or may never assimilate the information at all. Likewise, when students have difficulty mastering math facts, they may be excluded from problem-solving activities requiring higher mathematical thinking.

In contrast, when science educators emphasize using and mastering the skills of the practicing scientist, reading is not as important, and calculators may be used. These same students with poor reading or math skills often have a wealth of knowledge in a particular area, however. These gifted students display those characteristics most gifted students possess: a propensity for advanced-level content, exceptional analytical abilities (Barton & Starnes, 1988; Silverman, 1989; Whitmore & Maker, 1985), and advanced problem-solving skills (Reis & Neu, 1994; Silverman, 1989; Whitmore & Maker, 1985; Yewchuck, 1986).

It is important for bright students who have problems with basic skills to have information-gathering options that do not insult their intelligence. Using inquiry methods, primary sources, and technology are exciting and sophisticated ways of learning. Field trips related to the topics in the required curriculum can provide these students with a great amount of content. Visual aids such as films, television documentaries, live drama, and computer software packages are especially helpful in conveying facts and new information to the student.

The adage, “A picture is worth a thousand words,” has unique relevance to the gifted learning-disabled student. Lectures, taped interviews, and books on tape also provide relevant data. Mark is a perfect example of a student’s accessing complex information by the use of visuals in lieu of reading. Mark can take a Chilton’s automotive guide and follow the diagrams to perform auto maintenance procedures, for instance. Likewise, most theoretical science articles include illustrative diagrams to capture the essence of a model or procedure. Debby, too, used alternate sources of information by visiting the museum, examining artifacts, and interviewing the curator for her research on Jerusha Webster.

Alternate access also includes oral descriptions from practicing professionals and guided hands-on activities that demonstrate verbal and mathematical concepts. This process has been used for years as mentors have guided students to complete given tasks. A visual artist, for example, does not refer to written text but, instead, demonstrates a technique for students to observe first, then apply.

Difficulty with Spelling and Handwriting

Another characteristic of students with learning disabilities is weakness in spelling and handwriting (Schultz, Carpenter, & Turnbull, 1991). Recent research indicates that remediation in these areas takes some 30% of resource room instructional time (Scruggs & Mastropieri, 1989; Ysseldyke & Algozzine, 1982)—time in which gifted learning-disabled students could be otherwise engaged in stimulating, higher order thinking.

Although gifted students have important ideas to share, they find themselves in a quandary when needing to express their thoughts and create original products. In many cases their reluctance to demonstrate their limited spelling ability or reveal their poor handwriting inhibits their work, leaving them frustrated at not being able to share their products. Thus, the cycle of failure is reinforced, with students again the losers at learning.

To enable students to express and create without the burden of spelling and writing inadequacy, alternate ways for them to express ideas and create products must be provided. It is a curious note that while professionals are encouraged to use a variety of presentation methods to communicate their ideas, youngsters often do not have this option. Furthermore, research shows that when gifted students with learning disabilities *are* given these opportunities, they can produce advanced products (Baum et al., 1995; Silverman, 1989). For example, Debby acted out her information by means of a slide-tape show. Darrell, too, captured the essence of the Mideast crisis in a political cartoon.

Using technology is one avenue by which gifted students with learning disabilities can become successful learners. Through the use of technology, these students are able to access and organize information, increase accuracy in mathematics and spelling, and improve the visual quality of the finished product. In short, when gifted students with LD complete assignments on the computer, they can rapidly produce work that will make them proud—and, incidentally, surprise observers. When these students are denied access to technology, their disability begins to look like a real handicap (Baum et al., 1991).

Language Deficits in Verbal Communication and Conceptualization

The previous topics have dealt with students’ ability to read written text, spell accurately, and write information in an intelligible manner. The population of gifted students with learning disabilities, as demonstrated by WISC profiles (Silverman, 1989), appears to be divided between those who experience extreme difficulty with verbal communication and those whose language facility is so great that they seem to have a story for every occasion.

A particular problem for students who have difficulties with verbal communication is auditory processing. Students with these problems may be decoding only a minimal amount of the

information being presented orally by the instructor. The nature of their disability is such that they need more time to process verbal communication than is required by their nondisabled peers (Mercer, King-Sears, & Mercer, 1990; Ysseldyke & Algozzine, 1982).

Their auditory processing difficulties notwithstanding, these students demonstrate a facility with and enjoyment of abstract concepts (Baum et al., 1991; Rosner, 1985; Silverman, 1989; Yewchuck, 1986), and often use advanced vocabulary and manipulate words to capture them (Barton & Starnes, 1988). Even students who may lack the necessary vocabulary to express advanced-level concepts can find alternate methods. Many times they use their spatial strengths to create three-dimensional models to represent the ideas they have such difficulty conveying verbally (Baum, 1997).

Visual and kinesthetic experiences used to convey abstract ideas concretely remove the stumbling block of verbal communication and its partial or delayed understanding. The verbal path is simply bypassed to allow the visual image to guide the mental processes. In this way, graphics and carefully selected visuals enable abstract ideas to be seen rather than heard. Through the use of their alternate intelligences (Gardner, 1983), students circumvent the language problem that so many gifted learning-disabled students experience throughout their educational careers.

Organization

Many gifted students as well as students with disabilities experience difficulty with sequential organization. Primarily random learners (Gregorc, 1982), they encounter a problem when they try to organize information sequentially. This problem may affect their ability to receive, process, and communicate information as discussed above. For example, when they attempt to take notes during a lecture, these students often become confused as to how to organize the content into major topics and subtopics. Each fact can appear to be a separate and equal entity, a misperception that seriously strains their capacity to remember (Sah & Borland, 1989).

These nonsequential learners see things holistically and find many ways to develop relationships among ideas (Barton & Starnes, 1988). Thus, they may have difficulty with more linear tasks like developing a well-written essay or an outline to organize ideas for a paper or project. Visual organizers such as webs, Venn diagrams, and storyboards are particularly helpful to these students. There are many resources available (e.g., higher thinking maps, computer software programs) available to assist teachers in using these strategies with their students.

Focus and Sustained Attention

The biggest deterrent to learning today for many students is an ability to focus and sustain attention. Although many of these students have specific learning disabilities, their problems in paying attention are most glaring. Indeed, classifying them as "attention-deficit disorder" takes precedence (M. Cherkas-Julkowski, personal communication, 1995) over other learning problems, which may be contributing to student inattention (Baum et al., 1991). However, many gifted students with attention problems in traditional classrooms are not only highly focused when engaged in areas of strength and interest but exhibit high levels of task commitment in overcoming problems and creating products (Baum et al., 1995; Tannenbaum & Baldwin, 1983; Whitmore, 1980).

Educators, then, need to develop curriculum so that it engages the student. Using interest-based curriculum (Renzulli, 1977) or creating entry points to curriculum based on a student's unique profile of intelligences or talents (Gardner, 1995, 1999) will provide the context in which students will have little difficulty sustaining attention. When allowed to engage in authentic methods of a discipline or real-world inquiry similar to the methods used in the vignettes given above, students are transformed from passive consumers of extant knowledge to active creators of new knowledge. This constructivist approach not only increases attention but deepens understanding of content (Gardner, 1993).

Social Interaction

A common complaint of both gifted and learning-disabled students is their lack of social skills (Whitmore, 1980). The underlying reasons for this deficit may differ from student to student. The learning-disabled student may miss social cues that inform behavior and fail to develop the skills of socialization as a result (Adelman & Taylor, 1986; Taylor, 1989). In addition, their lack of confidence in their own academic abilities often prompts them to act out to hide their weaknesses (Olenchak, 1994; Tannenbaum & Baldwin, 1983). Gifted students, on the other hand, have considerable information to share with peers but often find that their peers are not interested in advanced-level information. Rejection by their peers may result in hostility and arrogance on the part of the gifted student (Colangelo, 1997; Hollingworth, 1926; Webb, Meckstroth, & Tolan, 1982). Thus, students who are both gifted and learning disabled are often at great risk for becoming loners or trouble makers (Baum, Neu, & Cooper, 1997).

To address the issue of inappropriate social behavior in students both learning disabled and gifted, it is important to understand that socialization involves having a basis for relating to others. An individual needs to feel that he or she has something to contribute to a relationship and has a need or motivation to relate (Adelman, & Taylor, 1986; Silverman, 1989). These students first, however, must have the opportunity to interact with peers with similar strengths and interests. Working together on a mutually decided goal brings about teamwork and sharing. This teamwork implies that each member of the team has something valuable to offer (Gentry & Neu, 1998; Maslow, 1962) to the team's success. Requiring students to work collaboratively, in which their contributions consist of passing out materials or being the time keeper, may not allow for true expression of students' talents or worth. Working together on writing and illustrating a book, on the other hand, where one student is the writer and the other, the illustrator, can have a positive effect on student self-esteem and social skills. Thus, the dually differentiated curriculum must offer opportunities for students to work together in areas of strengths and interests in which contributions are based on individual gifts and talents.

Social and Emotional Concomitants

Due to persistent failure, many students with LD lose their confidence in their ability to succeed. Their academic self-efficacy continues to diminish over time (Olenchak, 1994). The situation seems even more dismal for students with LD who have high cognitive ability. Because of their cognitive prowess, they have a heightened sensitivity to failure, and are troubled by the vast discrepancy between what they can and cannot do (Baum & Owen, 1988). In their study, Schiff, Kaufman, and Kaufman (1981) concluded that, "in many ways, the emotional concomitants of these learning-disabled students [with superior intelligence] seem striking in their severity and were apparently more exaggerated in the pervasiveness of their impact than is typical for conventional learning disabled populations" (p. 404).

Thus, traditional self-esteem programs appear to offer little hope of convincing high-ability, learning-disabled students of their worth; rather, these students need opportunities to solve authentic problems that impact real audiences. Such empowerment causes students to feel like contributors to society (Cooper, 1998). A dually differentiated curriculum provides opportunities for students to set goals and work on relevant issues as the context for learning and applying basic skills.

WHAT THE CURRICULUM LOOKS LIKE

A curriculum best suited to enable gifted students with LD to succeed must be adapted to the students' complex educational needs described above and shown in Table 1. This curriculum becomes the fulcrum that maintains the delicate balance between students' strengths and limita-

tions. It must be challenging enough to engage these students in their learning, provide alternate ways of accessing information, and offer options for communication that tap into their unique talents, steps recommended strongly by a report from the U.S. Department of Education, Office of Educational Research and Improvement (1993), "National Excellence: A Case for Developing America's Talent."

A particularly effective approach is allowing students to solve real problems in which students use authentic methods of the practicing professional to investigate problems in particular domains and create original products to communicate their results (Gardner, 1995; Renzulli, 1982). In this kind of learning, basic skills are integrated into a meaningful context and are seen as relevant by the students (Baum, 1988; Baum et al., 1995). The role of the teacher is more of a facilitator than a provider of all information. The teacher-facilitator assists students by making suggestions, asking probing questions to help the students clarify their thinking, and encouraging them in their quest for solutions. In the scenario that follows, note the components that comprise the dually differentiated curriculum: inquiry; alternate ways to access information; options for communication; creative production; integration of basic skills; and freedom to succeed. Each of these components signals a curricular accommodation to help gifted learning-disabled students achieve the balance between their often-contradictory learning needs.

One aspect of the Project High Hopes experience enabled the students to participate in authentic problem solving experience. Working in interdisciplinary teams or "companies" the Project High Hopes students sought to solve the problem of a deteriorating pond located on their school property. Their goal was to produce a proposal containing a creative solution for reconstructing the pond.

Students representing each of the talent areas comprised a company; in this way, students with talent in a given domain lent their individual talent to the group effort. In this example, talents represented were engineering, performing arts, science, and visual arts—areas research has shown to be productive for individuals with learning disabilities. (Note that students described in the vignettes also showed talent in these areas.) This learning experience gave talented fifth- and sixth-graders with learning disabilities an opportunity to become bona fide real-world problem solvers, using the authentic tools of the discipline (Cooper, Neu, & Baum, 1996). The culmination of the simulation extended the authenticity of the problem even further: students presented their solutions to the school board for planning purposes.

The steps to inquiry provided the structure to organize the task (Gentry & Neu, 1998). Furthermore, students were able to access information, using methods that did not depend on their reading skills, and communicate their ideas using talents to build, draw, and act rather than produce a proposal in writing. Inquiry took place in a laboratory environment in which teachers acted as facilitators to guide the research and development teams, or "companies," in the Creative Problem-Solving Process (Parnes, Noller, & Biondi, 1977). When needed, content-area specialists, or mentors, from selected disciplines furnished technical advice on tools, techniques, and materials used by practicing professionals in those specific domains. Both teacher-facilitators and mentors taught students to capitalize on their innate talents and strengths; hence, students remained engaged in their learning, intimately involved in a curriculum they found meaningful, challenging, and fulfilling.

Students soon were fully focused on their respective problems. They applied the Creative Problem-Solving Process as a strategy for examining the problem and formulating alternate solutions. A study guide was developed (Gentry & Neu, 1998) that provided sample topics the students used as a springboard to higher level thinking about the pond's deterioration and postulate open-ended "what if" questions to help with the solutions their company was continuously formulating. It also guided them as they focused on attributes of the problem and asked relevant questions. Which species of animal life had once inhabited the pond? What degree of stress had the existing

bridges tolerated? Finally, the study guide served as a management plan to organize the group's investigation.

When students began to finalize plans for their forthcoming presentations to the school board, they eagerly sought advice from the content-area mentors for polishing those presentations creatively and professionally. Students were so devoted to their work that creating a product of whose quality they could be justifiably proud became an increasingly important consideration to them. Students checked their designs with the professional engineer. Had they applied correctly the engineering and design principles he had taught them? What corrections or changes might the mentor suggest the group consider? The questions mentors asked students were designed to probe, guide, and coach. Answers came from the students themselves, a point of critical importance in the instruction component of this model and a characteristic observed in each student described in the vignettes at the beginning of this article, as well.

As mentioned frequently throughout this article, although gifted learning-disabled students generally are limited in their reading and math skills, these youngsters have a propensity for advanced-level content in their talent area, nonetheless. The challenge for teachers, then, is to find alternate ways for these able students to access the information they need. In the Project HIGH HOPES experience, students in one company "became" the animals that had been associated with the pond in its healthier state. How better to study the problem than through the eyes of one of its important elements? Getting into character in this manner added an element of intensity of purpose that enabled more complex understanding and appreciation by these students, similar to what Debby had experienced during her historical research on the life of Jerusha Webster. In these roles, the students discovered that the water was too shallow and too warm for them to thrive. Wanting to test their ideas about the effect of temperature on plant and animal behavior, the students in this company set up experiments with the science mentor. These students found it such fun to be face-painted by the visual arts mentor to get into character that they decided to incorporate this technique when presenting the problem of the pond to the school board, lending a striking visual component to their comparison and contrast of the ecological conditions they had investigated.

The availability of the four mentors was central to the students' understanding new information. The point at which students needed the scientist's expertise is precisely when a company sought out the science mentor. In this problem-based learning model, students seek knowledge when they need it—much as Tim did in conducting his science fair experiment on squash seed growth described earlier. In particular, students with special needs learn more effectively this way than by trying to store up knowledge for possible use at some future time. Bright youngsters with LD require concrete, immediate application of skills and concepts. Authentic learning was emphasized continuously throughout this exemplary learning experience.

Communicating their research findings to an authentic audience likewise concerned with the problems associated with the pond presented a challenge that the students met with ease. Undaunted now by limitations in their verbal language, these students found alternative means of communicating their results used by professionals in their talent area. Each company's students represented the range of domains and accompanying talents: engineers, performing artists, scientists, and visual artists. Companies worked with the performing arts mentor to perfect their presentations, blending the elements of movement and drama to add a highly desirable professional touch to their performance. Their products included a model of a new dam built to scale, a mural to show how the pond would look if their suggestions were implemented, and a dramatic performance to illustrate how the pond improvement would affect its inhabitants.

As the reader has no doubt grasped firmly by this point, the dually differentiated curriculum centers on authentic learning experiences. Instruction is neither contrived nor prepackaged; learning outcomes are not predetermined. Creativity occurs when teachers design learning experiences that include opportunities for students to explore, experiment, and expand their knowledge base.

Inherent in this approach to curriculum and instruction is authentic assessment, also. Given their difficulties with reading and writing, students experiencing the dually differentiated curriculum create products of such a complexity that, were they to use pencil and paper, they could never represent accurately what they have learned. In short, the dually differentiated curriculum offers highly able students with learning disabilities the alternate routes they so sorely need for product development.

In every aspect of the students' presentations, their integration of basic skills was evident. For example, one company had calculated the cost of implementing its proposal and included an itemized budget in its presentation. This budget reflected, also, the higher level skills of comparison and contrast, forecasting, and evaluation. Likewise, basic science skills were integrated into the students' curriculum. Students applied the basic skill of classification as they learned to identify insects with the help of their science mentor. In addition, they applied the scientific method as they developed original experiments to test the effect of temperature on pond creatures.

Basic communication skills were enhanced by incorporating the use of video, a technique several companies employed. Their videos reflected thorough planning and organization, together with creative photography from many perspectives, developing and polishing a smoothly flowing script, and enhancing the final product with appropriate sound effects.

Students also learned the skills of organizing for work. Delineating tasks, sequencing logically for carrying out those tasks, determining who was responsible for each task, and deciding on the time needed to complete the tasks became a natural function of each company once they were assembled for work. The challenge of solving authentic problems within a given time frame forced the students to organize their efforts efficiently, effectively, and economically.

Collaboration, too, is an important skill for students with learning disabilities to learn. In one school, two students, as their company's scientists, collaborated to develop the script for their presentation. One of these students used her superior verbal skills while a classmate, who was deaf, signed the message for the nonhearing members of the audience.

CONCLUSION

Gifted learning-disabled students frequently spend their school lives feeling trapped by their learning deficits and totally ignored with respect to their talents. As one young middle-schooler remarked, "Everyone in the school knows what I *can't* do, but absolutely no one knows what I *can* do!" These students need to experience the freedom to succeed as learners—for the first time in their lives, perhaps.

With the dually differentiated curriculum adapted to their specific needs in a laboratory environment, which encouraged inquiry, experimentation, and the discovery that accompanies both, Project HIGH HOPES students found their abilities and talents could help them compensate for problematic weaknesses as they applied basic skills creatively to an authentic problem. Students felt free to use their talents in the arts, engineering, and science to develop their visions for a creative solution, a sense of freedom these students seldom experience in their traditional school settings. This type of curriculum enriches students' life experiences qualitatively, adding depth through an integrated approach without adding content in a linear way.

How powerful the dually differentiated curriculum can be for the gifted learning-disabled student is illustrated by the following testimony offered by a parent of one:

My son never knew he could read. Since he has been involved in the program, he has read three books this marking period. He now knows he is smart and is confident in his new-found abilities! I hope that one day all teachers will know what you know about students like [our son] and that these different learners can *participate* in learning instead of just *watching* from the sidelines.

If we truly want *every* child to maximize his or her potential—which includes talent in areas not always addressed at their particular grade level in school—we must create a learning environment conducive to success, maintain high expectations, and instill high hopes in each learner to become an expert in his or her area or talent. The dually differentiated, problem-based curriculum offers students authenticity in the content of the curriculum and in the methods and materials used by professionals in a given field. Experts from different disciplines can both help teachers develop authentic curriculum for their students, like the example given above, and mentor the students, as well. Indeed, when education focuses on real-world experiences and can offer mentoring opportunities for students, motivation for learning increases. Youngsters are eager to learn, become successful, and be recognized by peers and adults alike for their accomplishments.

Certainly, all children would benefit if curriculum and instruction were tailored to their strengths and individual talents. As Darling-Hammond (1996) argues, what is needed is an education . . . that seeks competence as well as community, that enables all people to find and act on who they are; what their passions, gifts, and talents may be; what they care about; and how they want to make a contribution to each other and the world (p. 5).

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