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ABSTRACT

These two newsletters from the National Research Center on the Gifted and Talented (NRC/GT) contain the following articles: (1) "NRC/GT: Professional Development--Not an Event" (E. Jean Gubbins), discusses NRC/GT research-based principles related to professional development and the importance of ongoing professional development; (2) "Williams Syndrome: A Study of Unique Musical Talents in Persons with Disabilities" (Sally M. Reis and others), describes the relative strengths that individuals with Williams Syndrome have in language and music and the successful use of the "Music & Minds" program; (3) "Gifted Program Evaluation in Progress" (Darla-Gail Bohn), discusses an ongoing gifted program evaluation process; (4) "Attention Deficit Disorders and Gifted Students: What Do We Really Know?" (Felice Kaufmann and others), examines the etiology of attention deficit hyperactivity disorder (ADHD), assessment and diagnosis of ADHD, and the coexistence of ADHD and giftedness; (5) "NRC/GT Researchers: Brandwein Always Looked Forward" (E. Jean Gubbins), discusses the contributions of Dr. Paul F. Brandwein to identifying and nurturing gifted children; (6) "The Effectiveness of Triarchic Teaching and Assessment" (Robert J. Sternberg and others), describes the successful use of the triarchic theory of problem solving to teach social studies, science, and reading; (7) "Thinking and Writing Skills in High Ability, Ethnic Minority, High School Students" (Deborah Coates and Mariolga Reyes), discusses the success of the Teaching Thinking Project in promoting academic skills in gifted, ethic minority, high school students; (8) "Gifted and Talented Programs in America's High Schools:

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A Preliminary Survey Report" (Rachel Sytsma), contains preliminary results that indicate most high school gifted programs lack coordinators and do not offer academic opportunities beyond some combination of mentorships/internships, early college programs, independent studies, and academic clubs/competitions; and (9) "Teacher Bias in Identifying Gifted and Talented Students" (Teri Powell and Del Siegle), discusses gender and performance factors influencing gifted identification. (Articles include references.) (CR)

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THE NATIONAL RESEARCH CENTER ON THE GIFTED & TALENTED

NEWSLETTER

SPRING 2000 & FALL 2000

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THE National Research Center on the Gifted and Talented NEWSLETTER

Spring 2000

NRC/GT Researchers: Brandwein Always Looked Forward

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As educators and researchers, we have a natural inclination to look back at educational theories and practices to see what has been learned and to look around to determine how we can improve current instructional strategies and curricular approaches. Then we use formal and informal data to make decisions about what comes next. These data-based decisions have a considerable impact on the young people we work with every day.

At The National Research Center on the Gifted and Talented (NRC/GT), many of our publications focus on identifying the gifts and talents of young people whose potential abilities may go unnoticed. Obviously, it is easier to recognize demonstrated abilities of students such as the following:

- read and interpret text that is 3 or 4 years above age/ grade level;
- construct and solve complex mathematical problems, illustrating an advanced level of conceptual understanding; or
- design and implement a new approach to a science experiment, resulting from rejections of earlier hypotheses.

Some 3-year-old children already recognize letters, speak in complete sentences, write their names, draw basic geometric shapes, and ask questions about how things work. Their inquisitiveness is remarkable, which encourages adults, siblings, and older children to create more opportunities to promote their curiosity and zest for learning. It is more difficult to recognize potential gifts and talents among children who may not have had exposure to numerous early educational opportunities in the home or at school.

Looking back at the works by Dr. Paul F- Brandwein is an incredible educational experience. His contributions to identifying and nurturing the obvious and latent talents and gifts of young people would fill more than the 16 pages of this newsletter. A literature search of publications illustrates the breadth and depth of his work that provides the blueprint for making decisions about why we must constantly question and rethink how we create educational opportunities.

In 1955, Brandwein produced a book entitled *The Gifted Student as Future Scientist: The High School Student and His Commitment to Science.* This book was later updated and published in 1981. There are several sections of the book that I review periodically. As a scholar and researcher, Brandwein asked himself: What Makes a Scientist? He then pursued the following strategies as a way of responding to the question:

- noted characteristics of scientists through observations;
- checked the growing body of knowledge through discussions with colleagues, teachers, and supervisors;
- prepared a booklet describing the high school program in which he worked; and
- asked for a critique of his findings and conclusions from 100 experts in the field of science teaching.

Brandwein looked back, looked around, and made decisions about what came next. He stated:

> . . . [F]rom the observations of working scientists as well as from common sense observations, it seems clear that Genetic and Predisposing Factors were not all that operated in the making of a scientist. Opportunities to get further training and the inspiration of the individual teacher were

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> clearly factors to be considered in reaching a working hypothesis on the nature of high level ability in science.

Brandwein's study of research scientists supported Genetic Factors, such as high oral and written verbal ability and high mathematical ability. He believed that Genetic Factors

> appear[ed] to have a relationship to high intelligence and may have a primary basis in heredity. Naturally, Genetic Factors are altered by an environment. It fact, it is clearly understood here that . . . any individual is the product of his [her] heredity and his [her] environment. (p. 9)

Predisposing Factors were characterized by persistence and questing. Persistence requires an extended time commitment to a research question that must be addressed despite failures and frustrations. Questing means "a notable dissatisfaction with present explanations and aspects of reality" (p. 10). These factors, however, may be necessary, but not sufficient to explain the making of a scientist. Continued study revealed the importance of the Activating Factor or "opportunities for advanced training and contact with an inspirational teacher" (p. 11). As a researcher and scientist, Brandwein offered a working hypothesis:

> High level ability in science is based on the interaction of several factors—Genetic, Predisposing, and Activating. All factors are generally necessary to the development of high level ability in science; no one of the factors is sufficient in itself. (p. 12)

Brandwein did not generate hypotheses about teaching and learning from a position outside the classroom. He was the teacher, the researcher, and the scholar who implemented his ideas in schools. He experimented with instructional and curricular approaches and made adjustments as warranted. He created a learning environment for students whose potential in science was "to be determined." A brief overview of the operational approach to identifying, nurturing, and supporting potential does not do justice to Brandwein's ability to determine "what is next?" (see Brandwein, 1981). In the operational approach, high school students participated in general science and the talent search began. He posed questions such as:

- Whose curiosity is insatiable?
- Whose work is exemplary?
- Who goes beyond course requirements?
- Who has science-related hobbies?

Invited and self-nominated students were involved in laboratory work beyond their scheduled classes, such as preparing lab materials, assisting in experiments, maintaining a school museum, or participating in science clubs. Students continued to receive guidance and encouragement to pursue additional science opportunities. These opportunities became increasingly specialized and required a considerable commitment to scholarly work. Students were living and working as junior scientists, lending further research evidence to the working hypothesis related to high level ability in science. As the breadth, depth, and complexity of the science work increased, Dr. Brandwein posed new questions and tested hypotheses about learning and teaching. He continually challenged his thinking.

The National Research Center on the Gifted and Talented continually approaches research by looking back at what has been learned, looking around at current practices, and determining what's next. We are adding to the knowledge base initiated by so many renowned people in our field. An effective way to peruse our research findings to date is to visit our web site at www.gifted.uconn.edu. Abstracts and findings are available for each research monograph produced by the NRC/GT. This collection represents a small portion of our contributions to the literature, however. Our most recent count of publications totals over 500. Obviously, the web site is a more efficient way of looking back at what we have learned. Our 10 year research journey has benefited from the past and current work of so many scholars, researchers, and practitioners. Dr. Paul F-Brandwein is one person we always look to as a role model as we continue our search for answers to questions about learning and teaching.

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The Effectiveness of Triarchic Teaching and Assessment

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According to Sternberg's Triarchic Theory of Intelligence, intelligence results from information processing components being applied to experience for the purposes of adaptation to, shaping of, and selection of environments. According to this theory, intelligence and the intellectual skills that constitute it and form the basis of intellectual achievements are forms of developing expertise—they can be developed just like any other forms of expertise. Abilities are not fixed, but rather, flexible.

Basics of the Triarchic Theory

The triarchic theory is based on the notion that all students need to learn a problem solving cycle. First, they need to identify problems. In other words, they need to know that they must get their homework done, study for a test, write a paper, and get it in on time. Second, they need to allocate resources for solving the problem. For example, they need to think in advance about how much time and effort to allocate to doing homework, studying for a test, or writing a paper. They also need to plan when they will start and finish their work. Third, they need to formulate a strategy for solving the problem. For example, they need to decide how to get their homework done, or study for the test, or get their paper written. What kinds of notes will they use? What kinds of study strategies will work best given what they need to do? What kind of help will they need? Fourth, they need to monitor their problem solving. For example, as they are studying or writing a paper, they need to be aware of whether things are going smoothly, or whether they are encountering problems they need to fix. Fifth, they need to evaluate their problem solving. After they are done with the task on which they are working, they have to decide whether their work is adequate or whether they need to improve on what they have done.

According to the triarchic theory, three kinds of thinking are essential to problem solving, in particular, and to human intelligence, in general.

- **Analytical thinking** occurs when the components are applied to relatively familiar types of problems in their abstracted form. Analytical thinking is involved when people analyze, evaluate, judge, compare and contrast, and critique. For example, a student might be asked to evaluate the assumptions underlying a logical argument or to compare and contrast the themes underlying two short stories.
- **Creative thinking** occurs when the components of information processing are applied to relatively novel types of problems. Creative thinking is involved when people create, invent, discover, explore, suppose, and imagine. For example, a student might be asked to create a poem or to invent a better mouse trap.
- **Practical thinking** occurs when the components of information processing are applied to highly contextualized, everyday problems. Practical thinking is involved when people apply, use, utilize, implement, and contextualize. For example, a student might be asked how the lessons of the Vietnam War are and are not relevant to the situation that has arisen in Serbia, or how to apply algebraic techniques to determining compound interest on an investment.

Validation of Theory

We are interested not just in proposing theories, but also in conducting rigorous tests of these theories in the laboratory,

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classroom, and workplace. Some of the main findings from these studies are the following:

1. The analytical, creative, and practical aspects of intelligence can be measured via both multiple-choice and essay formats. Formal modeling supports the triarchic model of intelligence over competing models, such as a model of an overarching general factor and a model of content factors. Analytical, creative, and practical intelligence are essentially distinct; there is no general factor of intelligence that applies across all kinds of intellectual tasks.
2. Tests of analytical intellectual abilities tend to correlate well with conventional tests of intellectual abilities because these tests measure what the conventional tests measure.
3. Tests of creative intellectual abilities are relatively domain specific and correlate weakly to moderately with conventional tests of intelligence, with the correlations being higher the more novel the content of the conventional tests.
4. Tests of practical intellectual abilities correlate weakly or not at all with conventional tests of intelligence and predict real world occupational success as well as or better than conventional tests of academic intelligence, thus complementing conventional tests. Under special circumstances, tests of practical intelligence may show negative correlations with conventional ability tests.

Our Data

In our earlier research, we showed that it is possible through instructional interventions to improve analytical-thinking skills, creative-thinking skills, and practical-thinking skills. In our more recent research, we have shown that the triarchic theory can be applied to improve students' achievement in school (Sternberg, 1997; Sternberg et al., 2000).

The Triarchic Aptitude Treatment Interaction Study

In this study, we examined whether the triarchic theory would give rise to an aptitude treatment interaction in the context of a college level psychology course taught to high school students who were selected for their triarchic ability pattern, and then taught in a way that either better or more poorly matched their ability pattern, and whose achievement was assessed triarchically as well. Thus, a crucial aspect of this study was that identification of participants, instruction of participants, and assessment of participants' achievement all were based on triarchic theory of intelligence. The motivation for this study was to show that conventional means of teaching and assessment may systematically undervalue creatively and practically oriented students. These students may have the ability to perform quite well, but they may perform at lower levels than those of which they are capable because neither the form of instruction nor the form of assessment well matches their pattern of strength.

Participants consisted of 199 high school students (146 females and 53 males) from among 326 who were tested and who were selected for participation in a summer program on the basis of their patterns of abilities. Program participants were 60% European-American, 11% African-American, 6% Hispanic-American, and 17% American from another ethnic minority (thus a total of 34% U.S. ethnic minority). Another 4% were from South Africa and 2% were from other locations.

Participants were identified as high in analytical ability (20%), high in creative ability (19%), high in practical ability (18%), balanced high (i.e., high in all three abilities—20%), and balanced low (i.e., low in all three abilities—24%). Identification was accomplished via a research form of the Sternberg Triarchic Abilities Test (STAT), which is based on the triarchic theory. There were 9 multiple choice tests, crossing 3 types of abilities (analytical, creative, practical) with 3 types of content (verbal, quantitative, figural), plus 3 essay tests (analytical, creative, practical). For example, the analytical verbal multiple choice test involved inference of meanings of unknown words from paragraph contexts, and the practical figural multiple choice test involved route planning use maps. As another example, the creative essay required participants to design their ideal school.

The 4-week long instruction for the course involved common and unique elements for each instructional group. Two parts were common: the college level psychology text, which contained analytical, creative, and practical content; and the morning lectures, taught by an award winning teacher, which involved analytical, creative, and practical elements. The experimental manipulation occurred in the afternoon when participants were assigned to a discussion section that emphasized either memory, analytical, creative, or practical processing, and that either was a better or a poorer match to the participants' tested pattern of abilities.

As an example, memory oriented instruction might ask students to recall the main elements of the cognitive theory of depression; analytically oriented instruction might ask students to compare and contrast the cognitive to the psychoanalytic theory of depression; creatively oriented instruction might ask students to invent their own theory of depression, drawing on, but going beyond past theories; and practically oriented instruction might ask students to show how they could use existing theories of depression to help a depressed friend.

All participants were tested via homework assignments, a midterm examination, a final examination, and an independent project. All assessments were evaluated for analytical, creative, and practical achievement. The examinations also included multiple choice items that measured memory achievement.

All correlations of ability tests scores (analytical, creative, practical) with all measures of achievement were statistically significant, reflecting perhaps the fact that the instruction and assessment were guided by the same theory as was the identification instrument (i.e., the STAT). More important was the aptitude-treatment interaction, which also was statistically significant for all ability groups. In other words, students who were better matched triarchically in terms of their pattern of abilities outperformed students who were more poorly matched. Perhaps as interesting was the result that the analytical (IQ-like) test tended to identify as gifted, mostly White children, of middle to upper middle socioeconomic class background, who were students in so-called "good" schools. The creative and practical tests, however, identified students from a much wider mixture of ethnic groups, socioeconomic levels, and educational backgrounds as gifted.

The Triarchic Instructional Studies in Social Studies and Science

In a follow-up set of studies, we sought to show that in terms of simple main effects, triarchic instruction is potentially superior to other forms of instruction, regardless of students' ability patterns. The triarchic theory holds that students should be instructed in a way that helps them both capitalize on their strengths and correct and compensate for weaknesses. Thus, ideally, students will be taught in all three ways (analytically, creatively, practically), as well as for memory. These studies were conducted in the students' own schools rather than in a special summer school setting; their teachers were their actual classroom teachers; and the material they studied was the actual material they were studying as part of their regular instruction, suitably modified as necessary for the study.

Participants in a primary school study included 213 third grade students (106 boys and 107 girls) in two elementary schools in Raleigh, NC. Both schools serve a diverse population of almost exclusively lower socioeconomic status students, including large groups of African-American, Hispanic-American, and Asian students. A total of nine classes of 20-25 students each participated in the research.

During the intervention, students received an instructional unit on the topic of communities—a social studies unit required for third grade students in North Carolina. No formal text was used for the unit, rather, materials were developed by teachers. The intervention took place for 10 weeks, 4 days per week, for 45 minutes per day, for a total of 30 hours of instruction.

Participants in a secondary school study consisted of 141 rising eighth graders (68 boys and 73 girls) drawn from around the nation from predominantly White middle-class backgrounds. Students took a summer psychology course either in Baltimore, MD, or Fresno, CA, in connection with the Center for Academic Advancement at John Hopkins University. The 10 section course took place in two intensive 3-week sessions. Classes met 5 days per week with 7 hours of class time per day.

In both studies, students were divided into three instructional groups: traditional (memory oriented), critical thinking (analytically oriented), and triarchic (analytically, creatively, and practically oriented). Instructional time was the same in each condition, and all teachers were appropriately in-serviced.

To illustrate the three different instructional treatments, consider three ways in which a third grade unit on public services (e.g., fire, police) can be taught. The approach taken in the traditional instruction was to have children memorize the names and functions of the various public services. In critical thinking instruction, an additional analytical effort was undertaken whereby students would compare and contrast the different services and evaluate which ones to keep—and why—in case of a budget crisis. In triarchic instruction, students might additionally be asked to invent their own public service, to

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describe its means and ends, and to compare this new public service with conventional ones.

Students in both studies were evaluated for memory-based achievement (via multiple choice tests), as well as for analytical, creative, and practical achievement (via essay tests). For example, a memory oriented assessment might ask which of several officials is an elected official. An analytical assessment might ask students to write a page explaining what a person in a given governmental position (e.g., Mayor of Raleigh) does, why the position is needed, and why the position is one of authority. A creative assessment might ask the student to imagine a place where no one tried to be a good citizen, and to write about a third grader's visit to this place. A practical assessment might ask the student how to handle a situation in which he or she is in charge of teaching 8-year-old students visiting from England different kinds of government services available in Raleigh, NC.

The results from the two studies were roughly comparable. In general, triarchic instruction was superior to the other modes of instruction, even on memory based multiple-choice items. In other words, students showed better academic performance through triarchic instruction even if their achievement was measured in terms of pure memory-based performance. In the elementary school study, students also were administered a self-assessment questionnaire for which the students were asked how much they liked the course, how much they thought they learned in the course, and how well they thought they did in the course. The students in the triarchic group generally gave significantly higher ratings than did the students in the other two groups.

The Triarchic Reading Studies

More recently, we have extended our work on applying the triarchic theory in the classroom to the goal of improving reading performance (Sternberg & Grigorenko, 2000). We chose as a target a group of students with the average reading scores among the lowest in the state of Connecticut (according to the Connecticut Mastery Test scores), namely, students in New Haven public schools. The project had three parts. One part was a middle school community study, a second part a Summerbridge (summer program) study, and a third part a study in a community high school. All of these studies were long-term and were fully infused, building on existing curriculum units rather than introducing new ones. As in the earlier studies, we were trying to help teachers improve what they were already doing (e.g., teaching reading), rather than giving them a new curriculum that they would most likely reject for lack of time.

The first, the middle school study, involved two phases. In phase 1, 2 schools (10 teachers and 146 students) participated as an experimental group and 2 schools (4 teachers and 171 students) participated as a control group. In phase 2, 4 schools (14 teachers and 350 students) participated as an experimental group and 3 schools (9 teachers and 225 students) participated as control groups. The reading material in this study was the actual material the students were studying in school, namely, stories from *Light Up the Sky*, a Harcourt Brace Treasury of Literature basal reader. In this study, all students received a pretest involving 2 vocabulary, 2 comprehension, and 2 homework (a take home section) assessments, and a posttest with the same elements. Only the experimental students received the intervention, with the other students receiving their normal reading instruction. All teachers (experimental and control) were involved in professional development geared to their appropriate role. Thus, experimental group teachers were involved in triarchic teaching, and control group teachers on the use of mnemonics to help improve student memory performance. The program lasted from November through the remainder of the school year.

The second, the Summerbridge study, was smaller in scope, involving 5 teachers and 33 seventh graders as an experimental group and no teachers and 29 seventh graders as a control group. In this study, all students were accepted for a summer program, and then the experimental students who were selected at random from the total group were told that they would get the summer program in the summer of 1998. The control students, also randomly selected, participated in the summer program in the summer of 1999. In the Summerbridge study, the reading material was chosen by regular teachers of the program, and included two novels, *A Raisin in the Sun* and *The Lottery Rose*. All students received a pretest and posttest. The 6-week intervention was given only to experimental group students. In these studies, the goal was to supplement standard reading instruction—which included both phonic and whole language elements—with a specifically triarchic intervention. An example of an analytical activity would be to create a time line that requires students to order a series of major events that

happened in a story. For the story "Teacher for a Day," students are told that first Belva went to school, then Miss Englehardt became dizzy, then Belva taught the class, then _____, then Belva used the lever to move the rock. The students had to fill in the blank with one of four events. An example of a creative activity, performed after reading the story "Many Moons," required students to speculate, on the basis of incomplete information, on why there are rainbows after storms, why rainbows might have so many different colors, and why cows say "Moo" so much of the time. An example of a practical activity, done after the students read "A New Home in Ohio," required students to plan an escape from slavery using an underground railroad. Students were given a map, a set of tools, and a set of survival rules to aid them in planning the escape route.

The third study at the high school involved our working with teachers in different subject matter areas (English, mathematics, science, arts, social science, history, and foreign languages), with a focus on teaching reading for content. The participants in the study were high school students attending grades 10 through 12 in high schools in New Haven and Ansonia, Connecticut. A total of 432 students (130 females, 215 males, and 87 of unreported gender) participated in the study. Of these students, 201 (46.5%) were attending schools enrolled in the triarchic group (2 New Haven schools) and 231 were attending the control school (in Ansonia). Teachers' guides and student assessments were developed based on each teacher's specific curriculum.

We analyzed the data from these studies in a variety of ways. One way was to look at changes in teacher behavior. Before our middle school intervention, teachers in a typical classroom lesson used an average of 18 memory analytical activities (combined), 0 creative activities, and 3 practical activities. After the intervention, experimental group teachers used an average of 18 memory analytical activities, 13 creative activities, and 17 practical activities. The intervention thus had a huge (and significant) effect on teacher behavior in the teaching of reading. Analysis of individual teacher behavior revealed that almost all individual teachers showed changes in behavior as a result of the intervention. Teachers also were asked to rate the program on various facets on a 1 (low) to 7 (high) scale. Sample ratings were 6.4 for interest to the teacher, 6.0 for interest to students, 6.2 for motivating the teacher, and 6.1 for motivating the students. Students were also asked for their feedback. Of the total, 35% liked the activities very much, 51% liked the activities, 10% did not care much one way or the other, 2% disliked the activities, and 2% hated the activities. Most importantly though, were the assessments of objective improvement. In the middle school study, the experimental students showed significantly greater gains than the controls in reading and vocabulary. For the Summerbridge study, the experimental students in the program showed significantly greater gains than the control students in analytical, creative, and practical achievement. Overall gains were significantly greater for experimental than for control group students. In the high school study, a comparison of students' reading/writing skills before and after the intervention suggested that the triarchic teaching improved students' performance significantly more than did conventional teaching. As was the case at the middle school level, both teachers and students rated the program positively.

Conclusion

Triarchic teaching—teaching students not only for memory, but for analytical, creative, and practical processing—works. It improves achievement assessed via either conventional or performance assessments at all grade levels and in all subject matter areas we have examined, across a range of socioeconomic and achievement levels of students.

Triarchic teaching is easy to do. The main principles are simple:

1. Some of the time, teach analytically, helping students learn to analyze, evaluate, compare and contrast, critique, and judge.
2. Some of the time, teach creatively, helping students learn to create, invent, imagine, discover, explore, and suppose.
3. Some of the time, teach practically, helping students learn to apply, use, utilize, contextualize, implement, and put into practice.
4. Some of the time, enable all students to capitalize on their strengths.
5. Most of the time, enable all students to correct or compensate for their weaknesses.
6. Make sure your assessments match your teaching, calling upon analytical, creative, and practical as well as memory skills.
7. Value the diverse patterns of abilities in all students.

Any teacher knows how to teach triarchically. Our goal is simply to give teachers a simple-to-follow "recipe" to make sure the

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teachers do what they already know how to do. You can start teaching triarchically right away, and start seeing significant improvements in your own students' achievements and attitudes.

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Thinking and Writing Skills in High Ability, Ethnic Minority, High School Students

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Acquiring the skills necessary for academic success is a major academic and social problem facing gifted under represented, ethnic minority, high school students. These students often have not had the experiences and opportunities available to students with successful academic careers. A persistent problem is how to help students develop strong discourse and writing skills. Few programs of support exist for high school students within a college setting. Those within high schools or community settings are often not evaluated. Some highly structured college support programs have demonstrated that it is possible to support these students' academic development so that they can take advantage of their high abilities despite lacking contextual opportunities. Harney, Brigham, and Sanders (1986) and Brigham, Moseley, Sneed, and Fisher (1994) describe efforts to support the success of academically at-risk minority college freshman.

Several variables have been identified in these studies that appear to affect minority student success, particularly at large universities. Three important factors are: (a) the development of important academic skills, (b) involvement in the cultural and social life of the academic institution, and (c) self-confidence to compete with their majority peers (Brigham et al., 1994). In addition, these programs find that motivation and persistence are important characteristics of success. We wanted to explore how to give high ability, ethnic minority, high school students a "headstart" on college academic success through a college course.

Three Important Intellectual Skills for Academic Success

Robert Sternberg (1995) proposed a model of intelligence that is useful for developing talent in high ability students and is applicable to teaching all students. The triarchic theory of intelligence can be used for identifying, teaching, and assessing gifted students. This model can help teachers focus on the skills necessary for academic and social success. The triarchic model suggests that three intellectual abilities are important to academic and social success: (a) memory analytic, (b) creative synthetic, and (c) practical contextual thinking skills. Sternberg and his colleagues have described these skills as well as interventions and materials designed to enhance them in high school students. Memory analytic abilities are used in learning, comparing, analyzing, evaluating, and judging material. Most traditional standardized intelligence, aptitude, and achievement tests assess these skills. Creative synthetic abilities are used when one produces something new from a synthesis of material or develops a novel interpretation of an ordinary situation. This could also involve coping in a novel way with various life situations. Practical contextual abilities are those used to confront everyday problems encountered in day-to-day experience. This experience could occur at school, work, or home. Understanding how the world "works" and how to get along in it, whether based on formal or informal knowledge, represents this kind of thinking.

The Sternberg triarchic abilities model provides a basis for individualizing instruction or intervention activities to maximize

ability and performance by matching instruction to performance. Academic performance can also be enriched by activities that enhance positive self-regard and social support. Extending a skills-based college success intervention to include high school students would seem to give these students an opportunity to have a "headstart" on excelling in academic performance in college. Furthermore, using a specific skills-based thinking model to develop the instructional intervention might improve academic performance outcomes. This thinking skills approach can also be useful to teachers in enhancing basic writing skills required by advanced academic training. We are currently using this approach to offer a college based academic and social support project to high ability, ethnic minority, high school students.

Teaching Thinking: A High School Intervention Project

We are working in one urban high school to offer thinking and writing training to high ability ethnic minority high school students. We call our effort the Teaching Thinking Project (TTP). This intervention research effort, begun in 1996, is designed to promote academic skills in highly capable, ethnic minority, high school students. We use Sternberg's model of triarchic intelligence, described above, as an organizing framework.

The TTP offers a unique opportunity to recruit high ability students from a low income high school with students from some of the most under represented ethnic minority populations in the U.S. Participants in this research intervention are a sample of students attending an academic magnet school in a large eastern urban city with a current population of 1,541 students on a college campus. Of the participants, 50% are Latina/os (primarily of Dominican and Puerto Rican descent); 30% identify as being of native-born African descent; 16% report that they are Caribbeans of African descent; and 4% can be classified as Asian (Chinese and Pakistani). Many of these students, if accepted in college, would be the first generation in their families to attend college.

The Intervention

We select students to participate based in part on their Sternberg Triarchic Abilities Test (STAT) scores (Sternberg, 1995). The STAT assesses how well students answer questions that require them to use analytic, practical, or creative thinking skills. The test includes both multiple choice and essay questions. We use the test so we can select students who have a particular strength, but also need to improve some thinking or writing skills. Students attend a one semester, college level, introductory course in psychology. The course is held 3 days a week for three lectures and 1 to 2 hour lab sessions with a college mentor. Class size is about 12 students. Each student is assigned to a highly successful and trained college mentor, who is matched with them based on thinking skills that need improvement.

Lectures are designed to encourage students to develop their thinking and writing skills by applying their thinking abilities to specific situations presented in the course. We use Sternberg's (1995) *In Search or the Human Mind*, as a text. The text is supported by a generous and useful array of CD ROM, test-bank, lecture, and hands-on materials. The text is particularly useful because it is organized to emphasize to students how to think using higher order thinking. Sections of the text, practice materials, and questions for thinking, writing, and examinations are identified as focusing on one of Sternberg's three thinking skills. For example, when students are introduced to material about the brain and sensation and perception, they are presented with activities and questions that ask them to think analytically by comparing and contrasting various theories about how perception occurs. They are also given an opportunity to think creatively by answering questions that challenge them to create or construct such as: "If you were designing the human brain, what would you do differently to render humans more adaptive to their environments?" And, they are given an opportunity to rehearse practical thinking skills by answering questions like: "What tasks would require the use of binocular depth cues? How might a person with only one eye compensate for the lack of binocular depth perception?"

During lab sessions, participants are divided into three small groups (practical, analytic, and creative) according to their lowest score on the STAT. The college mentors facilitate the discussion of class material in the small groups. The students discuss questions from the chapter assigned for that particular session and their responses are recorded by one of the students in each small group. Students also use lab time to meet individually with mentors to plan writing projects and to develop writing skills based on critical feedback of writing samples.

Academic and Social Support

The mentoring relationship is an important part of our intervention. We find that mentors do become role models for

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the high school students. During the mentoring sessions, mentors talk with their mentees about family, school work and environment, interpersonal relationships, as well as the students' emotional state. Mentors explore the students' state of mind by talking about upcoming academic and extracurricular events, the students' overall academic performance, and personal issues. Mentors meet with their mentees once a week for an hour and keep detailed notes of their mentoring sessions. During the semester following students' participation in the project, they often visit the lab and are encouraged to continue to work with mentors to develop academic skills and to begin or complete the search for colleges. Some students develop close relationships with their mentors.

Lessons Learned

Although the results of this study will not be available until the intervention is completed, we have learned the following two important lessons from the experience of working with high ability, ethnic minority, high school students who are under represented in gifted programs:

1. **Assessing initial intellectual abilities.** The STAT has three subtests that assess analytic, creative, and practical thinking skills. Possible scores range from 1 - 12 for each multiple-choice sub-test, with 36 being the maximum score possible for an overall total score. We found that the average STAT multiple-choice subscores for our sample of 54 students to date were moderately high. For the multiple-choice sub-tests, students had a mean score of 6.7 on the analytic sub-test; 7.9 on the creativity sub-test, and 6.6 on the practical sub-test. The mean total score is 21 (*SD* = 3.77). Sternberg (1995) reports a slightly different pattern of results for a sample of 199 high ability high school students who participated in the original summer course on which the TTP is based. Of these students, 60% were of European descent and 40% were described as ethnic minority. Sternberg (1995) reports a mean of 7.9 for the analytic; 8.6 for the creative and 8.1 for the practical subscore for these students. While the Sternberg sample scores consistently higher than the TTP sample, both samples score highest on the creative and lowest on analytic subscales. The TTP sample scores equally low on the practical subsample, but the Sternberg sample scores for the practical and creative subtests are very similar. Since we used STAT scores to select students and to assign them to the particular thinking skills intervention best suited to their thinking profile, we plan to look at whether or not these scores improve after the intervention. We offered students help in the thinking skills area where they seemed weakest and allowed them to learn by working on assignments using their best thinking skills. Preliminary results indicate that STAT scores improve for analytic and creative, but not practical subscores.

2. **Meeting Students' Academic Needs.** The high ability ethnic minority high school students have a number of academic needs. One of their major needs is to develop writing skills that meet college standards. Most of the students who participated in the project had difficulties meeting basic college writing standards, and we had to give them detailed feedback on their essay questions and research papers. Students had difficulty elaborating in written assignments and difficulties with the mechanics of writing (e.g., grammar, punctuation, syntax). Two of the difficulties identified by our mentors, the instructors, and the students were: (a) understanding the question to be addressed and developing a coherent and relevant answer; and (b) organizing ideas, and developing coherent arguments. We have developed a number of writing workshops to help students develop writing skills and one-on-one coaching sessions with mentors also helped students improve their writing skills. Students report experiencing a stronger sense of confidence in their writing skills and studying techniques. We will provide detailed analyses of how students' writing improved and scoring criteria for assessing student writing in the classroom at the conclusion of the project.

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Gifted and Talented Programs in America's High Schools: A Preliminary Survey Report

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Research on gifted and talented programs in elementary and middle school grades abounds. Research addressing gifted and talented programs at the high school level is relatively scarce. There are two primary reasons for the apparent lack of research information pertaining to high school level programming. First, much of the literature and survey work on gifted and talented programming is grouped into two categories—elementary and secondary. This breakdown makes it difficult to identify programs particular to high schools. We can infer, from the quantity of literature available on middle school program models and teaching strategies and the scarcity of similar literature for high school level programs, that much of the information associated with "secondary" programs is generated from middle school data. Second, there exists a common conception that Advanced Placement and Honors courses at the high school level sufficiently address the needs of gifted and talented students. The result is either that educators do not perceive a need for a gifted program in high schools or that Advanced Placement and Honors courses define a program.

The 1998-1999 State of the States Gifted and Talented Education Report (1999) reveals mandatory identification of gifted and talented students for 30 states (12 states do not have a mandate, while 9 states—including the District of Columbia—did not submit information) and mandatory programming for gifted and talented students for 26 states (16 states—including the District of Columbia—do not have a mandate, while 9 states did not submit information). The academic levels to which these mandates pertain are not specified. There is a discrepancy between mandatory identification and mandatory programming or servicing—several states mandate identification, but do not mandate programming.

No comprehensive, national data exist about both the prevalence and nature of gifted programs specifically for grades 9 through 12. We designed a survey to determine how gifted and talented students' needs are being addressed within America's high schools. The sample is the Collaborative School District (CSD) network, associated with The National Research Center on the Gifted and Talented, who report having gifted and talented programs at their high schools (N=227). Rural, suburban, and urban districts are nearly equally represented (urban is slightly under represented). Our hope is that the survey will begin to clarify the types of programs and services available for high school gifted and talented students. It is essential to note that the results addressed below highlight a small number of the questions from the survey because of the preliminary nature of this report. A more thorough report will be published after more surveys have been returned and analyzed.

Preliminary Analysis

Results of preliminary survey analysis (N=90) indicate that 86% of the respondents' high schools do not offer academic opportunities beyond some combination of mentorships/ internships, early college programs (sometimes called dual enrollment), independent studies, and academic clubs/ competitions. When asked if the gifted and talented program extended beyond mentorships/internships, dual enrollment, independent studies, or Advanced Placement/Honors/ International Baccalaureate courses, 34% responded "Yes" while 66% responded "No." Additional offerings clearly fall into one of four groups: special classes (seminars, research courses, or gifted and talented courses), academic competitions, affective/counseling component, and/or special schools (residential, summer, magnet, or Governor's) that are accessible to students. Special classes are offered by 55% of the respondents, special schools offered by 19%, and both affective/ counseling components and unique academic competitions representing 13% each of respondents' additional offerings.

Recall that the survey sample was drawn from the CSD network reporting a gifted and talented program at the high school level. Survey results show that 5% of the respondents do not offer a high school gifted and talented program. This discrepancy is most likely the result of changes in programming, funding, or personnel since the last CSD database update (1997).

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While 95% of respondents claim to have a gifted and talented program, less than half (35%) have a consultant or coordinator associated with those programs. Additionally, several of the respondents whose programs do have consultants or coordinators indicated that consultants or coordinators are often either servicing the entire district or simultaneously functioning in another capacity (such as special/regular education teacher or administrator).

A few interesting and unexpected trends are emerging. First, several schools that have gifted and talented programs at the high school level are servicing students who were last identified in middle school or even elementary school. Second, (and perhaps as a result, in part, of the first) several respondents commented that gifted opportunities at the high school level are open to students regardless of whether they are identified.

When respondents were asked for additional comments, responses included expressing awareness of a need to better address gifted and talented programming in our high schools as well as expressing frustration or a lack of clarity with regard to state mandates for gifted and talented identification and servicing. The latter responses are the result of respondents' feeling that the mandates are insufficiently communicated, enforced, or monitored.

Limitations

There are two levels of limitations with regard to this survey. The sample was convenient rather than random. The Collaborative School District network is a mutually beneficial, voluntary partnership between The National Research Center on the Gifted and Talented and 368 districts, representing all 50 states and a few territories. The second limitation is consequent to the first. We must be cautious in interpretation of data. The results of this survey will provide an idea about what programs currently exist, but the fact that the survey is drawn from a convenient sample prohibits generalization of our analyses.

There are also limits to this preliminary report. As mentioned earlier, this analysis addresses only some of the questions and responses. Additionally, as this survey is being field tested with this sample, areas for survey improvement have emerged. The changes in the survey will improve clarity of questioning, thus yielding more specific and reliable data from the respondents. Because it is preliminary in nature, our snapshot view may change as additional surveys are returned. A final report will be available at the conclusion of this survey project.

Future Plans: The Big Picture Versus the Snapshot

This survey will provide initial indications of what high school gifted programs entail; it is a means for updating our knowledge about programming within the Collaborative School District network as well as a field test for an expanded research project. Targeting the Collaborative School District network provides us with a snapshot view of programming options offered by schools with a high school gifted and talented program. To see beyond the snapshot to the bigger picture, a national survey will be sent to school districts or high schools. The current survey will be revised according to respondent difficulties identified during the field test. The revised survey will then be sent out to districts or high schools randomly selected in every state. The results from that survey will provide a more thorough picture of high school gifted and talented program availability and programming options on a national level.

Recommendations

It is important for us as an educational community to continue to strive for learning environments that optimally meet the needs of all our students. To collectively work toward that end, we are challenged to define clearly what we can offer students as well as how those offerings help us work toward school, district, community, and national goals. Please feel free to contact us with information you feel may be helpful to our research. We are particularly interested in school or district publications describing programming options for gifted and talented students at the high school level.

Joseph Renzulli, the Director of The National Research Center on the Gifted and Talented, recently published an article entitled "What is This Thing Called Giftedness and How Do We Develop It? A Twenty-five Year Perspective" in the *Journal of the Education of the Gifted* a quarterly journal of The Association of the Gifted. This article appears along with six critiques in the Fall 1999 (Vol. 23, No. 1) edition of the journal. Dr. Renzulli's article is also available on the Internet at **www.gifted.uconn.edu** and can be found under "New Articles."

Teacher Bias in Identifying Gifted and Talented Students

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Teachers are often asked to nominate students for gifted and talented programs. Whether or not teachers are qualified identifiers of gifted students has been the topic of much debate throughout the years (Gagné, 1994; Hoge & Cudmore, 1986; Pegnato & Birch, 1959; Rohrer, 1995). The purpose of this study was to identify student characteristics that might influence teacher referrals for gifted and talented programs.

Teachers as Raters of Giftedness

Pegnato and Birch (1959) compared the efficiency and effectiveness of seven different methods of identifying gifted students and observed that "teachers do not locate gifted children effectively or efficiently enough to place much reliance on them for screening" (p. 303). The Pegnato and Birch study has been used for almost 40 years to discount the value of classroom teachers as qualified identifiers of gifted students. Their work has been frequently cited to support the opinion that classroom teachers are not reliable at identifying gifted students in their classrooms.

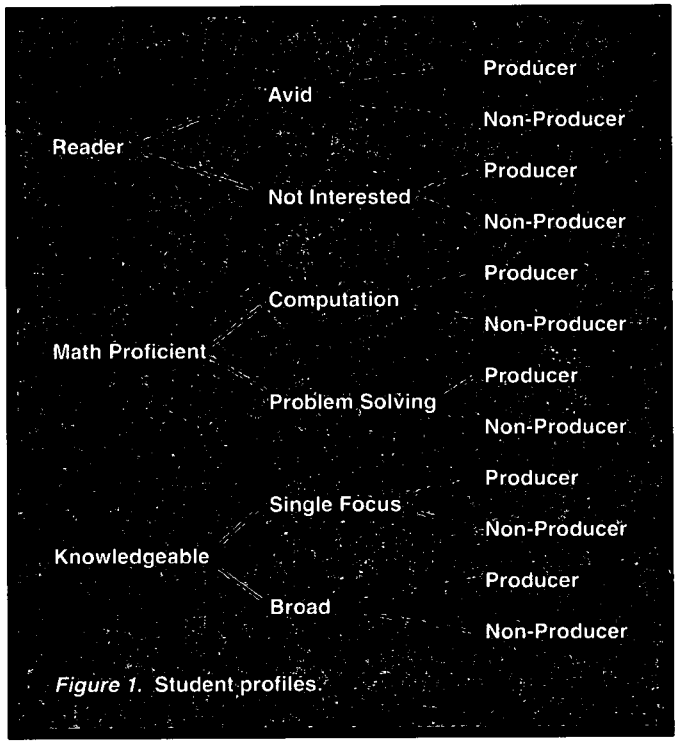

Figure 1. Student profiles.

Gagné (1994) criticized the methods employed by Pegnato and Birch. "We should not compare the effectiveness and efficiency levels of a given method (e.g., method X is very effective, but not very efficient) because these two indices will move in opposite directions as we change the cut off scores" (p. 125). Gagné suggested that data from the Pegnato and Birch study be reevaluated by computing a correlation coefficient between each method and the criterion. After reanalyzing the data, Gagné found that "teachers do not come out worse than most other sources of information, including some subgroups of the Otis" (p. 126).

More recent studies have also indicated that teachers are not the poor identifiers of gifted students that Pegnato and Birch (1959) indicated. Hoge and Cudmore (1986) suggested there is very little empirical foundation for the negative evaluation so often associated with teacher judgment measures. Rohrer (1995) found that while teachers' preconceived notions of giftedness could preclude children with certain personality traits from consideration for gifted programs, overall, "teachers were able to recognize intellectual potential in students who were not the stereotypical White, fit, well-adjusted, high-achieving students" (p. 279).

Renzulli and his colleagues (Renzulli et al., 1976) developed the *Scales for Rating the Behavioral Characteristics of Superior Students* for use by classroom teachers to nominate students. The *Scales* are among the most popular instruments of identification used today for nominating students for gifted programs. However, Renzulli cautioned that teachers should be trained before using the rating scales.

One area of concern in identifying students for gifted programs is gender bias. Gagné (1993) reported that

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males were more often thought to be more able in areas requiring physical or technical skill and females were perceived as performing better in the areas of artistic talent and socioaffective domains. Teachers spend more time interacting with male students in verbal and nonverbal ways (Mann, 1994; Oliveres & Rosenthal, 1992; Sadker & Sadker, 1993). Teachers face male students when talking (Sadker & Sadker, 1995) and give more detailed instructions to male students (Oliveres & Rosenthal, 1992). Not only do males received more attention, but the quality of this attention is higher than that received by females. Perhaps this additional attention translates into males receiving special "nomination" attention as well.

Bernard (1979) found that "irrespective of the sex of teacher or student, or course of study, students who are perceived as masculine in role orientation are likely to be evaluated more highly than students who are not" (p. 562). Dusek and Joseph (1983) also found that "teachers were more likely to expect high achieving students, regardless of gender, to be masculine or androgynous, and low achieving students, regardless of gender, to be feminine or undifferentiated" (p. 338).

Methodology

We developed 12 student profiles based on Tannenbaum's (1997) concept of producing and non-producing gifted students (see Figure 1). For example, we created four profiles that featured some aspect of reading. Two of the profiles depicted students who were avid readers, and two of the profiles depicted students who were not interested in reading. Of each of these pairs, one featured a student who was engaged in classwork (producer), and one featured a student who did not complete classwork (non-producer). In total, twelve different profiles were created. We created an identical set of 12 profiles in which only the gender of the student's name was changed. While one profile featured Brenda, an identical one featured Brian. Anglo names were used to avoid adding an additional selection criteria of ethnicity. The 12 profiles were given to a panel of three judges. Each judge correctly identified which of the 12 categories in Figure 1 matched the profiles.

We also created three additional profiles. One featured an introverted, quiet, absentminded student. Another involved a "cocky," dominant student who put down others. The final profile included a language arts oriented, avid reader with a large vocabulary.

The profiles were organized into two sets of 15. Each set contained a mixture of males and females who depicted each of the 12 categories shown in Figure 1 plus the 3 additional personalities. Ninety-two educators, classroom teachers (n=58) and gifted and talented specialists (n=34), who were attending a week-long, regional gifted and talented conference in the Northwest evaluated a set of 15 profiles. The educators were instructed to "Make recommendations of students that should be included in a gifted and talented program." A 4-point Likert scale with 1= "Definitely NOT include," 2 ="NOT include with reservations," 3="Include with reservations," and 4= "Definitely include" was used for each student profile.

Results

Gender differences were found with two profiles. Gifted and talented specialists and classroom teachers were similar in rating producing avid readers higher than non-producing readers. However, non-producing males who were not interested in reading were rated higher than similar females by classroom teachers. Introverted, absent-minded females were nominated with less confidence than males with similar nonproductive characteristics.

Math problem-solving producers were more likely to be nominated than similar non-producers. Gifted and talented specialists were likely to nominate producing and non-producing math problem-solvers than classroom teachers were. Non-producers who exhibited superior mental computation skills earned higher ratings than producers who used standard computation methods. Gifted and talented specialists valued mental computations more than classroom teachers.

The esoteric nature of students' knowledge appeared to influence educators' selections. Non-producers who were interested in airplane design and flying were more likely to be nominated than producing students who were interested in dinosaurs, a topic of interest to most elementary students. The nature of the student interest appeared to influence classroom teachers more than it influenced gifted and talented specialists.

Discussion

It appears that some gender stereotypes still exist when identifying students for gifted programs. Boys were excused for being disorganized and introverted. Non-producing avid readers who were male also received higher ratings than similar females.

The gender stereotype of females "liking reading" and boys "not liking reading" seemed to carry over to identification. It may be that when students fail to match the gender stereotype, their unexpected behavior draws attention to them. In some cases, this may increase the likelihood of their being nominated for gifted and talented programs. Tannenbaum (1986) described gifted traits as being both scarce and valued. Based on this preliminary study, it may be that some students are nominated for a program because they do not "fit the mold", rather than for the gifted behaviors that they exhibit. This finding is supported with the higher rating received by the nonproductive student with an esoteric interest over the producing student with a common interest.

Overall, students who chose not to engage in classroom assignments were rated lower than students of a similar profile who did engage in classroom assignments. Such students may be classified as underachievers. These underachievers end up being under-identified as well. Despite demonstrating productivity related to personal interests, these students were seldom recommended. This is unfortunate, since involvement in gifted and talented programs may provide the intellectual stimulation many of these students seek through personal interests. Baum, Renzulli, and Hébert (1995) found that students who had the opportunity to explore advanced projects related to personal interests often reversed their underachievement pattern.

Gifted and talented specialists tended to rate students higher than classroom teachers. It may be that they concentrated more on the positive aspects of the student profiles, rather than the negative ones. Programs for the gifted often concentrate on student strengths and interests and the gifted and talented coordinators may have been sensitive to these features of the profiles. Classroom teachers are often cast in a diagnose and remediate role with students. Under such expectations, they may be more sensitive to student weaknesses. Classroom teachers who are asked to identify gifted and talented students should be encouraged to identify characteristics that indicate giftedness, rather than look for reasons why a child is not gifted.

This study indicates that teachers need better training to help them recognize the stereotypical beliefs they hold about gifted and talented students. Such training will go a long way toward improving referrals for gifted and talented programs.

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THE National Research Center on the Gifted and Talented NEWSLETTER

NRC G/T

Fall 2000

Inside

NRC/GT: Professional Development—Not an Event

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> *"Reforms don't spread in places where teachers do not have the capacity to implement them."*
>
> Linda Darling-Hammond, AERA (1998)

What does professional development mean to you? Is it a periodic calendar event? Is it based on your school district's needs? Is it a time to discuss critical issues related to school district priorities? Is it mandatory attendance at a workshop? Are professional development opportunities self-initiated? To what extent have you benefited from professional development opportunities?

How would you answer the questions above? Do you think that your answers would be similar to those of other staff members? Why or why not? Try to gather some informal data by asking your colleagues about their views of professional development. Developing a working understanding of how professional development is viewed by staff members is a critical step in creating an effective plan tailored to your school needs, the needs of each staff member, and the needs of students as well as their parents.

Several years ago, we designed a survey of professional development practices in gifted education. We thought long and hard about the type of information that we wanted to know. We conducted a thorough review of the literature, . attended conferences, convened groups of professionals with various prior experiences, and drafted potential items. We wanted to know the extent to which professional development was really tied to the overall visions of school districts. Some of the resulting data from the survey were highlighted in an earlier newsletter (Westberg et al., 1998). Looking back on the data and the outcomes from several studies over the last 10 years of The National Research Center of the Gifted and Talented (NRC/GT) led to a synthesis of professional development principles. Over and over, one word captured the essence of the principles: *CHANGE*. Change is certainly difficult; it is a process. We may be acutely aware of the need to restructure a curriculum unit, develop challenging opportunities for students to demonstrate their mathematics or science skills, or address students' affective needs. Of course, the level of change required to respond to any of these identified needs would vary by person. Most likely, a quick fix would not be appropriate for any plan to change one's curriculum, instructional style, or classroom climate. Far too many times, a mediocre plan is created just to do something different. We really do not know if the plan will result in improvement or the desired change. We may just want to try something without really analyzing the best way to approach an articulated plan that is responsive to the identified needs at the school, grade, or personal level. We do not always attend to the context in which the change must take place.

The following principles consider the person, as well as the environment, the process, and the end product (e.g., changes in behavior, knowledge base, and instructional approaches). Take a moment and review the 16 principles that emerged from our research. We are sure that you will soon recognize that many of these principles are also reflective of literature beyond the field of gifted and talented education. Go ahead and place a check under "agree" or "disagree" next to each of the following NRC/GT research-based principles.

Do you agree with the NRC/GT research-based principles?

Agree	Disagree		
❑	❑	1.	Professional development requires a personal and professional commitment to make a change in existing strategies and practices.
❑	❑	2.	Professional development opportunities have to be in response to an identified need: school level, grade level, small group, or individual.
❑	❑	3.	Professional development must be multi-faceted and responsive to varied learning styles.

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Agree	Disagree		
❑	❑	4.	Professional development needs to go beyond knowledge acquisition; knowledge and experiences must be applied.
❑	❑	5.	Professional development may require mentor/ protégé experiences.
❑	❑	6.	Professional development may be more effective with opportunities to observe master teachers in similar roles, engage in collegial coaching, and demonstrate practices.
❑	❑	7.	Professional development requires time for reflection (e.g., How does this new strategy or practice add to my repertoire? Should this new strategy or practice replace a former one?).
❑	❑	8.	Professional development needs to have an impact on students, teachers, curriculum, school policies, or school procedures.
❑	❑	9.	Professional development needs to be valued.
❑	❑	10.	Professional development requires a desire to learn. Lifelong learners want and need opportunities for continual growth.
❑	❑	11.	Professional development requires a "personal growth plan" (e.g., What do I want to accomplish? What job will I seek? What skills do I need? How will new skills make a difference in the school or community? How will students benefit?).
❑	❑	12.	Professional development requires prolonged time, practice, feedback, and reflection.
❑	❑	13.	Professional development needs to be differentiated (e.g., What do I know? What do I need to know? How will I seek opportunities to learn? How will I share the experiences with others?).
❑	❑	14.	Professional development plans should reflect creative problem solving guidelines (e.g., find the problem, identify the problem, and seek sources to resolve or redefine the problem).
❑	❑	15.	Professional development requires administrative and collegial support and a willingness to experience failure.
❑	❑	16.	Professional development requires the collection, analysis, and application of school-level and district-level data to make informed decisions.

Count the number of checks you have under the heading of "agree." Did you agree with more than 10 principles of professional development? What were your personal professional development experiences that seemed to result in similar principles? Did you recall your early or current involvement in professional development opportunities?

Professional development has many definitions. There are also multiple terms used in textbooks, journals, and newsletters, such as staff development or inservice. Obviously, the preferred term or phrase is a personal choice, as long as people understand the definition. In our survey of professional development practices, we wanted to make sure that one definition guided the responses. We crafted several definitions and finally wordsmithed one that reflected our views:

> *Professional development is a planned program of learning opportunities to improve the performance of the administrative and instructional staff. (NRC/GT, 1996)*

I, too, reviewed the list of 16 principles of professional development in gifted and talented education and checked the appropriate boxes as I reflected on my experiences as an educator for over three decades. I recalled several early experiences with formal and informal approaches. Mandatory attendance at a presentation on a topic chosen by administrators was not always well received. Sometimes people, myself included, assumed the role of reluctant learners or disinterested attendees. The presentation topic may have been selected by someone's identified need, but those of us who were not engaged in the topic may not have recognized or even agreed with the focus. Clock-watching was a popular habit. I empathized with presenters who were clearly passionate and very knowledgeable about their topics. Many of them learned to read their audiences and to make adjustments in their pre-planned presentations. Obviously, this was not always an easy task. But this is what we ask of ourselves as we work with young people everyday. Shouldn't we also be able to adopt this same professional stance with adults?

At times, reluctant attendees connected with topics. You could see the changes in participants: body language, level of focus, engagement in questions and answers, or level of participation in hands-on activities. Successful professional development experiences are not a given. Missing the mark is a reality. However, if people are encouraged to share their ideas for the types, styles, or topics of professional

development opportunities, the potential for experimenting with suggested strategies and practices will most likely increase.

Designing formal professional development opportunities in response to identified needs is not difficult. One approach would be to ask teachers and administrators to list the outstanding achievements of the school. Then, ask them to list areas of improvement. Review the lists, check for common topics, and summarize the input. Return the lists for additional input by asking staff members to select their first priority for their school. What needs are identified most often? Share the summary of needs with staff members and discuss possible approaches to addressing identified needs. Involving faculty at each phase of planning professional development opportunities will certainly require a little more time, but the effort will be worthwhile.

Remember that professional development is not an event. It is an ongoing opportunity to help you meet your goals as they relate to your role as an educator. Each of us who has chosen to be an educator understands what an enormous responsibility it is to work with youngsters and adults who touch our lives. Changes in practices, instructional styles, or curriculum are realities in places where people have the talent, commitment, and resources to implement them. Are these the places where you want to work? Are these the places where you want your children to attend school?

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Attention Deficit Disorders and Gifted Students: What Do We Really Know?

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This monograph summarizes current scientific knowledge about Attention-Deficit/Hyperactivity Disorder (ADHD) in children and presents issues related to ADHD in gifted students. Causes, assessment, diagnosis, educational strategies and medical interventions are discussed. A range of perspectives, including behavioral, cognitive, and neurobiological, are applied to the interaction of ADHD and giftedness. Provisional recommendations for parents and teachers are provided along with directions for future research.

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NRC G/T

Williams Syndrome: A Study of Unique Musical Talents in Persons with Disabilities

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> *"The more a teacher is aware of the past experiences of students, of their hopes, desires, [and] chief interests, the better will he [she] understand the forces at work that need to be directed and utilized for the formation of reflective habits." (Dewey, 1939, p. 615)*

Smiling, sociable, and often musically adept, persons with Williams Syndrome (WS) have only recently been recognized as a distinct group of people with talents and needs that may differentiate them from people with other disabling conditions. *Music & Minds*, a 10-day residential program at the University of Connecticut, was based on talent development practices from the Schoolwide Enrichment Model (SEM). Participants' individual learning styles, prior experiences, patterns of talent development, and educational needs were considered in the development of appropriate programming (Renzulli, 1977, 1994; Renzulli & Reis, 1985, 1997). In particular, emphasis throughout *Music & Minds* was on the interests of participants, since research studies in a variety of fields have shown that learning is easier and more productive when people are able to work in an area of their own selection. Music was integral to all aspects of the program.

Why Williams Syndrome (WS) and Music?

Incidence of WS is estimated between 1 in 20,000 and 1 in 50,000 (Gorman, 1992). WS is evident at birth, occurs in all ethnic groups, affects males and females equally, and has been reported throughout the world (Pober & Dykens, 1993). Individuals with WS typically have cardiovascular abnormalities, short stature, and Full Scale IQs in the mildly to moderately mentally retarded range (Udwin, Yule, & Martin, 1987). Einfield and Hall (1994) described the "typical facial appearance, the so-called 'elfin' facies, with an upturned nose, sometimes called retroussé with a rather bow-shaped mouth. Abnormal dentition is always present. There is often a particular iris pattern [in the eyes] described as star shaped or stellate" (p. 276). Although individuals with Williams Syndrome have below average IQ scores, they have unique cognitive profiles characterized by relative strengths in language and music, which contrast with extremely poor visuospatial and visuomotor skills (Don, Schellenberg, & Rourke, 1999).

It is only recently that musicality in WS has been a focus of interest for researchers; however, love of music has been anecdotally associated with WS from the time the syndrome was first described. In an early report delineating the psychological characteristics of the syndrome, each child was noted to be musical (von Arnim & Engel, 1964). In another early case study, music was reported to be the child's "truest love" (Anonymous, 1985, p. 968). More recently, researchers initiated formal and informal studies of music in WS at Belvior Terrace, a Massachusetts summer music camp that added a special week for individuals with WS. Lenhoff (1996), a scientist and parent of a child with WS, reported that the WS campers exhibited high interest and responsivity to music, facility with complex rhythms, strong lyric memory, ease with composing, and a higher incidence of absolute pitch than seen in the normal population. Within the group, several campers stood out for specific accomplishments in music. Levitin and Bellugi (1998) tested rhythm production skills of 8 music camp attendees with WS (mean age 13.4 years) and found them equivalent to typically developing children of age 5 to 7 years for a number of correct responses, but more musical when responding in error. Don et al. (1999) used standardized tests of melodic and rhythmic discrimination as well as structured interviews to assess music skills of 19 children with WS (8 to 13 years). In contrast to earlier studies, these children were not selected because of their musical skills or interests. Results showed that music skills in the children with WS were at levels expected for vocabulary age peers. Tonal discrimination was equivalent to the control group, but rhythmic discrimination, though within expectation for receptive vocabulary age, was poorer. Musicality in the WS group was most frequently expressed by interest in music and emotional responsivity to music. The WS group expressed higher interest in music and greater emotional response, being made both happy (100% vs. 84%) and sad (79% vs. 47%) more often than the control children. Thus, as parents and clinicians have reported, music is an area of special interest and responsivity in many persons with WS.

Unfortunately, persons with WS are viewed as disabled, and previous research has focused on genetic, medical, linguistic, and psychological deficits. Educational programs have

generally focused on their disabilities and failed to provide opportunities for the specific identification and development of the unique musical talents observed in many persons with WS. The absence of a systematic approach to talent development in persons with WS that takes into account both their strengths and limitations has placed this entire group at an educational and occupational disadvantage. To counter this lack, *Music & Minds* was designed to investigate effective teaching practices in relation to the musical abilities, interests, and learning styles in the WS population.

Case Study of One Participant

Charles is 24 years of age. Charles was diagnosed with Williams Syndrome when he was 2 years old. Once identified, he was referred to a nearby association that had an early intervention program. He attended the program 4 days a week for 3 years. On the fifth day he slept because, as he explained, even though he enjoyed it, the program was very tiring. He next attended a local kindergarten where he began special physical and occupational therapy that continued until he was 12 years old. The local middle school had no appropriate program for students with special needs, so Charles was enrolled in a self-contained special education school in a nearby town where he stayed until he was 21 years old. In school, Charles performed poorly in mathematics, and hated work sheets. He still has difficulty writing and solving equations. He uses a calculator. However, he can count to 1000, and sort music tapes and cassettes by musical category, having developed the latter skill while working at a music store. He tells time with and without a clock; "it is a rhythm thing." He enjoys reading The Hardy Boys, Scottish novels, British heritage books and magazines, and romances.

From age 3, Charles demonstrated his musical talent by singing "Sesame Street" songs in both English and Spanish. He has had access to a piano since he was young. When he was 6 years old, his cousin gave him a Pavarotti record and Charles began to play along on the piano prior to any formal lessons. He has demonstrated perfect pitch, and has developed the ability to follow musical notation once he has heard the music played. "He relates to the ups and downs of print," his mother explained. At age 13, he began regular drum lessons, and later became a full member of a local Scottish Pipe Marching Band, where he has been promoted to (snare) drummer first class. He plays his instruments (snare drum, piano, keyboard, bagpipe chanter, and saxophone) for at least 2 to 3 hours a day, and listens to his records, CDs, and tapes for at least 4 hours.

Currently, Charles is completing a 3-year residential post secondary program focusing on independent living skills. Although he frequently says that "music is my life," it is not available at this 3-year program. At this time, employment possibilities for Charles are scarce and his family worries what might be available for him as he grows older.

The *Music & Minds* Program

Music & Minds was open to young adults (ages 18 to 29) with Williams Syndrome who exhibited interests and or talents in music. Sixteen individuals (8 males, 8 females) were invited to participate in the 10-day residential summer program held at the University of Connecticut during the summer of 1998 and 20 participants attended *Music & Minds* in 1999 (12 males, 8 females). The summer 1998 project was supported by the United States Department of Education, Office of Educational Research and Improvement, under the Javits Act. Educational psychology professors specializing in gifted and talented education organized the program and were joined by music, drama, and creative movement faculty. Allied health and physical therapy professors analyzed physical limitations, and developed individualized plans for increased mobility and physical fitness in the participants. Daily classes in chorus, general music, individual instrument or voice, movement, drama, and math were part of the multi-faceted program. Evenings and weekend enrichment activities included an in-house musical night-club, field trips to hear and play the local Carillon, and participation in an evening drumming session. Students were housed in double rooms and ate meals in the University cafeteria. Throughout the program, emphasis was on the joy of learning new skills and sharing accomplishments. A public performance reflecting all aspects of *Music & Minds* was presented by the participants on the final day.

Using Enrichment Programs

The conceptual framework of Music & Minds was based on components of the Schoolwide Enrichment Model (Renzulli, 1994; Renzulli & Reis, 1985, 1997). The SEM has three major components: analyzing students' talents, interests, and learning styles to identify patterns; modifying curriculum to address unique interests, abilities, and styles; and providing a series of planned enrichment opportunities based on the Enrichment Triad (Renzulli, 1977). The Triad, with over 20 years of research and development, is the cornerstone of the SEM program.

The underlying theory of SEM is Renzulli's (1978) three ring conception of giftedness, which focuses on the development of three interrelated clusters of traits (above average ability, task commitment, and creativity) as applied to a particular area of interest or talent. Approaching talent development in this way seemed particularly appropriate for use with

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persons with WS, who demonstrated interest in music, but required educational opportunities in other areas. SEM encourages creative productivity in young people by exposing them to a variety of topics, areas of interest, and fields of study; and trains them to apply advanced content, process-training skills, and methodologies to self-selected areas of interest.

Instrumentation and Results

Instruments used during *Music & Minds* were adapted from enrichment programs and used to identify interests in young people. Instruments such as "The Learning Styles Inventory" (Renzulli, Smith, & Rizza, 1997), "The Secondary Interest-A-Lyzer" (Hébert, Sorenson, & Renzulli, 1997), and "My Way...An Expression Style Inventory" (Kettle, Renzulli, & Rizza, 1998), along with personal records, anecdotal reports, checklists, and questionnaires, were used to collect information to develop appropriate programming for participants.

Parent reports, self-report, psychological testing, and school records indicated below average, but relatively strong verbal skills, such as vocabulary and memory. By contrast, participants demonstrated notable deficits in math abilities. Although participants' math skills were low, particularly in the area of fractions, they accurately used basic arithmetic facts and, to varying degrees, could add and subtract. Participants revealed poor self-concept with regard to math skills and were hesitant about their ability in this area. Parents reported that participants lacked basic math skills, and math was rarely applied in daily living, such as counting change when making a purchase.

Responses to assessment instruments revealed participants' strong preferences for discussion, verbal drill and recitation, lecture, simulations, peer teaching, and teaching games requiring demonstration and or verbal responses. In addition, their preferred expression styles were oral, dramatization, and music. With this in mind, lessons were developed that incorporated visual aids, games, lectures, discussions, and simulations.

Application of SEM to the Teaching of Fractions

The content of the *Music & Math* curriculum revolved around identifying equivalent fractions, understanding components of fractions, and practical applications to time, money, measurement, musical notes, and objects. Teaching of fractions was not taught theoretically or in isolation, but was tied to daily living. For example, students were asked to locate and identify the building halfway between a home and a shopping center on a town diagram.

Music was used as an instructional methodology and learning tool. A piano and drum set were present in the classroom and used by instructors, guest artists, and participants throughout the treatment. At appropriate moments, the piano provided parallel sounds and rhythms to the discussion of fractions. This was evident during the opening discussion where the piano helped illustrate the relationship between a fraction's denominator and numerator. For example, the concept of one-fourth was enhanced by playing four (4) quarter notes to represent the denominator and one (1) quarter note to represent the numerator. The difference between one-fourth, one-half, and one-whole was also demonstrated using musical notes and sounds. These differences were intensified by using rhythmic lines with clapping of hands and stomping of feet.

To strengthen memory, students created rhythmic "songs." These little musical ditties stemmed from the various rules or dimensions of fractions. One example was "To • tal • eq • ual • parts" (G-G-G-G-C) played as four quarter notes followed by a whole note. Students applied this rhythmic line to remember the meaning of the denominator, and instructors hummed the notes in rhythm (without words) as a prompt when needed during classroom activities. Musical variations were used to relate fractions to real world situations.

The Music in *Music & Minds*

Music & Minds was designed on the premise that music is a form of discourse that should be at the core of musical study, experience, and the music education of our WS participants. What did we learn about our participants with WS during *Music & Minds*? Prior experience had provided clear evidence that musically talented persons with Williams Syndrome often taught themselves to play a musical instrument—the drums, guitar, or perhaps the piano. They usually already knew the kind of sound in which they had an interest. They insisted on the right equipment. They listened to their mentors and tried to emulate them, and although they often ran into problems of sound production and control, they were able to find their own way through them, comparing notes with fellow practitioners. They often followed the example of preferred models. Throughout the program, participants were encouraged to move beyond a preexisting emphasis on performing by extending their musical understanding and techniques to include perceptive listening, improvisation, and composition.

Music classes included composing-listening, performing-listening, and audience-listening within a musical and cultural range wide enough for students to appreciate music beyond what they had previously experienced. Smaller groups than whole-class or whole-band or whole-chorus were found to be essential for student interaction, musical decision-making, and individual choice and were incorporated into larger classes. Curriculum was broadly defined rather than written in advance, so that it could be quickly adapted to the individual circumstances and daily challenges.

To identify how many participants had achieved various levels of ability in music, we operationally defined musical ability as "the ability to understand and improvise in music, as well as the high level of skills, both present skill areas and potential, that can be developed in music." We identified 5 participants as having high skill and potential. Another 5 participants were identified as having mid-level skills or potential, and 6 participants were described as having low performance or potential. Approximately 12.5% of our participants demonstrated perfect pitch and 25% demonstrated relative pitch.

With the exception of one participant, the most musically able participants had good word reading skills. All participants who displayed high levels of musical ability had similar patterns of home support, with early lessons and encouragement in music. Their parents provided continuous reinforcement for musical training and musical exploration. Participants who were lower in musical performance had parents who also provided a great deal of encouragement and support, but not in the area of music.

By offering persons with WS broad and deep musical experiences, we may be able to significantly increase the possibility that they will engage in a wider variety of talent development activities in these areas. We may also enhance their understanding of what is taking place musically and extend the musical skills that are available for their personal and professional use.

Educational Issues

Three findings from *Music & Minds* are critical. The first is that the individual within-syndrome variability in our groups of participants with WS was so large that group described traits are likely to be deceptive. Therefore, individual assessments of each child should be periodically performed to note the change and progress of the individual. For example, while most of our participants were extremely outgoing and friendly, some were shy and reserved. Seven participants appeared to be primarily auditory learners, 6 were more visual learners, and others were mixed. Several high-functioning participants had accurate appraisals of their abilities as compared with their chronological peers, and other young persons with WS. Although most were not particularly bothered by their deficits, and did not make external comparisons, higher functioning individuals appeared more susceptible to performance anxiety.

The second finding is that we must avoid the usual assessment stance of looking for disturbances or negative symptoms. While school psychologists are not usually inclined to look for positive behaviors, it is the positive behaviors that might act as a base to build constructive educational plans for this group. The teachers who interact with these children daily are usually well aware of the negative symptoms and could profit from knowledge of the potential to be discovered through positive traits.

Another important finding was that many of the participants were limited by firm, and sometimes inaccurate, beliefs about their ability to learn. Participants consistently told us what they could not do, such as "I can't measure," "I can't cut (with scissors, or with knives)." One young man had an acute physiological reaction to taking the pretest in math, sweating and repeating "I can't do this at all!" Several participants had distinct, rigid ways of doing things and could not break the pattern. "I have always done it this way and I can't change." This rigidity of style also appeared within music.

Accordingly, based on what we learned in *Music & Minds*, the following considerations should be taken into account in implementing programs for this unique population.

1. All participants displayed what may be described as a romance with music and rhythm. The absence of music in their school experiences and sometimes in their home life resulted in the loss of opportunities to find and develop their potential talent areas and also to find joy in their lives. Music could be used as a powerful teaching tool throughout school years to help develop skills in deficit areas.

2. Parents generally were realistic about the academic strengths and weaknesses of their children and were able to provide specific information about their abilities within content areas such as reading and math.

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3. Parental involvement played a key role in the development of musical talent. All the participants who displayed the highest levels of musical ability had extensive home encouragement.

4. Instruments focusing on learning styles, interests, and product style preferences that have been developed for general populations were easily adapted and helpful in identifying the interests, learning styles, and product preferences for individuals with Williams Syndrome.

5. Differences in living skills within this group should be recognized. Some participants were already extremely independent and needed to have flexibility and respect for their ability to live as almost self-sufficient adults. Others required much more support and help, but, when encouraged, quickly moved towards relative independence in some areas. Prior limiting expectations should be avoided.

6. The curriculum should not be planned in great depth in advance for this special population. Major themes should be identified, but the goal should be to develop curriculum around the interests, styles, product preferences, and abilities of each student.

7. Some deficits can be addressed and overcome through the use of strengths and interests. Math gains were made by a group of our participants when music was used to teach math.

Our experiences in *Music & Minds* were extremely gratifying for both participants and observers, but these experiences should extend beyond a 10-day summer program. By engaging the love and appreciation for music in persons with Williams Syndrome, we may increase confidence and abilities in academic areas. Purposeful development of musical skills has the potential to extend the talent potential and help enrich the lives of persons with Williams Syndrome.

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Gifted Program Evaluation in Progress

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Introduction

One of the most important, and most challenging aspects of the gifted coordinator's duties is program design. This task can be a large and daunting one. Many questions face the evaluator. How should the task of program evaluation begin? What information should be collected? Are there standards for a good gifted program? Where should the effort be focused? (see Fetterman, 1993; Renzulli, 1975). What follows are one district's answers to those questions. We reviewed current program policies and practices as a way to conduct an informal evaluation that would allow us to make decisions throughout the school year. The process is documented month-by-month to illustrate the steps of gathering input and making decisions. This small district is located in a suburb of Minneapolis, MN. It is comprised of one high school, one middle school, and two elementary schools. There is an elementary gifted coordinator (.60 full-time equivalent [FTE]), a middle school gifted coordinator (.33 FTE), and a high school advanced placement coordinator (less than .20 FTE).

August/September

The first step in the process was to look at the current program. We began with the identification process. The procedure being used consisted of a matrix system that assigned points to three pieces of information gathered about students. Parent and classroom teachers completed a very simple yes/no checklist of student characteristics. Also included on the matrix were the scores from the Cognitive Abilities Test (Thorndike & Hagen, 1993). Points were totaled and compared to the required minimum score needed for inclusion in the gifted program. Only students referred by a teacher or parent were tested at the end of first grade. The gifted coordinator had sole responsibility for identifying the students.

The gifted program at the elementary level was a pullout for identified students in grades 2-4. Identified students were clustered with one teacher at each grade level in one elementary building and dispersed among several teachers at the other building. Students in each grade level were scheduled to meet with the gifted coordinator every other day for a period of 50 minutes.

The next task was to identify the goals of the program. This proved to be more elusive. The program lacked written goals; however, a search of the district's records uncovered two pertinent documents. The first was the district board policy requiring the individual sites to develop procedures for identifying students for inclusion in the gifted program.

The second document was the final recommendation of the district-wide Gifted Education Study Group. This group consisted of parents, staff, and administrators from grades K-12. They met over an extended period, read current literature in the gifted field, and discussed the merits and applications for this district. The end result was a document that gave clear direction to the overall gifted program.

The resulting philosophy/mission statement was over 4 years old and had not been implemented. The study group provided valuable information regarding the district's focus for the program, but required updating. The opinions and suggestions of both staff and parents needed to be collected.

As part of the informal evaluation process, a brief written survey was given to all elementary teachers and parents of identified elementary students. Each group was asked to list positive outcomes of the program, as well as possible changes. Teachers were asked to indicate how the coordinator could help them in their classroom and what goals/outcomes they felt were important for the program. Parents were asked to list possible discussion topics for monthly parent meetings and to provide any other input they wanted to share. Four teachers from each building responded to the survey. Seventeen of the 56 families in the program responded.

A common thread found in the answers of both parents and staff was the positive response to the challenge the students received in the program, particularly within the math curriculum. Both groups also mentioned the positive effects on students:

- spending time in small groups reading and discussing challenging novels;
- participating in Junior Great Books (The Great Books Foundation, 1992) and Omnibus (Rogers, 1989) with parent volunteers; and
- working with Challenge Math (Haag, Kaufman, Martin, & Rising, 1986), which requires manipulating math concepts and using different number base systems.

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Several teachers wanted activities for the students to do after they completed other assignments. Parents asked for curriculum changes within the classroom instead of an add-on to an already full day. There was concern about students participating in the pullout program and returning to the classroom to make up work.

Parent responses for discussion topics were very revealing. The majority requested help with the social/emotional needs of gifted students. Parents wanted to know how they could help their child reduce anxiety, deal with perfectionism, and cope with underachievement and lack of motivation. Our direct response to these requests was to provide monthly parent meetings offering information and discussion on topics selected from this list.

While this information was being collected, the elementary and middle school gifted coordinators met to discuss the issues of continuity between their two programs. A meeting with the superintendent and the building administrators was requested and scheduled for early October.

October

The administrative meeting involved the three gifted coordinators, principals from the four buildings, the coordinator of teaching and learning, and the superintendent. Each participant was asked to respond to a few questions in preparation for the meeting. The questions included commenting on the current identification/placement process, the program as it currently existed, possible future program directions, and suggestions for moving forward in implementing those directions. Responses were varied. Three of nine participants had formal training in gifted education, each having earned a Master's degree in that field. Responses centered on the need to have a defensible identification process matched to services. Of particular concern was the need for all teachers to differentiate curriculum within their classroom. For example, some teachers believed students were spending too much time reading the basic chapter on the Boston Tea Party when they could be delving into the perspectives of the participants in the event. Their findings could then be presented to the class in a multimedia format. Because these teachers were also parents of gifted children, the need for parental communication and involvement was also seen as vital to the success of the gifted program.

Comments and concerns of the other members included everything from the desire to have good public relations within the community, to concerns with the elite nature of gifted programming, to the lack of funding, and to the unwillingness of some staff members to differentiate curriculum.

After much discussion, we developed a plan to help each member proceed in an organized and cohesive fashion. Some participants had specific concerns for their building; others were not convinced that change was necessary. In the past, parents raised concerns about the lack of continuity in the district. All agreed that this needed to change.

The identification process needed revision at all levels, particularly at the elementary level where initial placement generally occurs. All principals were asked to incorporate professional development opportunities on best practices and programs in gifted education through their site-based management teams. They were also asked to check on the status of differentiation at each site. Additionally, the elementary coordinator was asked to work with the coordinator of teaching and learning to begin revision of the elementary service model.

November

The administrative team met again in mid-November for a progress update. Professional development opportunities were being discussed at middle and high school levels, but at the elementary level there was little progress. High school course offerings were changing to incorporate advanced placement classes for the next school year. At the middle school, there were opportunities for a variety of co-curricular activities, including geography contests, spelling bees, and authors' conferences.

At the elementary level, progress was being made on redesigning the service delivery model. There were 13 identified students. One teacher chose to retain the pullout model for 7 identified students. Another teacher volunteered to use the resource model with 6 identified students. The resource model was designed to meet specific needs of a cluster of gifted students by providing resources and activities to extend and enrich grade level objectives and course materials. Extension activities were completed in the classroom, while other students worked on concepts they needed to master. In this way, the gifted program would be part of the students' day—not an add-on of curriculum that did not connect with regular curriculum. The intent was to give the other staff members a living example of what this model would look like. Six identified students remained in the classroom. The elementary gifted coordinator set aside

30 minutes every other day to focus on these resource students. Much of that time was spent preparing activities for these students to complete within their classrooms. Activities were prepared to enhance the curriculum, requiring performance at higher levels. Time was also available to introduce activities, conference with students as they worked on long-term assignments, and provide individual help with research and study skills. Classroom teachers and the elementary gifted coordinator collaborated closely on this model. The beauty of this arrangement was the flexibility it offered classroom teachers to include students not formally identified as gifted. Teachers could also exclude identified students from particular activities based on individual needs.

While progress was being made in several areas, identification for inclusion in the program was still a big concern. Several local districts were contacted to develop a good sense of how comparable districts were identifying students. After reviewing these processes, members assigned to this task made preliminary recommendations. The first recommendation was to delay the administration of the Cognitive Abilities Test (CogAT) until the end of grade 2. The elementary gifted coordinator would work within each grade 2 classroom providing whole group lessons in thinking skills and would keep problem-based assessment logs on students. The CogAT would be administered to all grade 2 students to be as inclusive as possible in the initial screening.

The next recommendation was to include the Kranz Talent Identification Instrument (Kranz, 1981) as a screening tool. This instrument asks teachers to identify talent areas in academics, arts, and motor skills. The third recommendation was to replace the current checklists with Renzulli scales (Renzulli, Smith, White, Callahan, & Hartman, 1976). The Renzulli scales offer additional information because each characteristic is rated on a one to four scale instead of with a simple yes or no. Both teachers and parents would be given instruction on how to complete the scale. The final recommendation was to involve a team, instead of just the gifted coordinator, to review each student's portfolio to determine the best match for services within the program.

There was some concern with these recommendations. Change can be difficult; it was certainly true in this situation. Over the next few months, there would be limited success with the acceptance of these recommendations.

January

We convened an advisory group consisting of teachers representing each grade level. It was a joint committee with teachers from both elementary buildings. It took a great deal of encouragement to find a representative from each grade level. Many teachers were already very busy and the gifted program was not a high priority. Eventually, the Gifted Advisory Group convened, including one representative from grades 1, 2, and 3, and two representatives from grade 4.

February

The Gifted Advisory Group met for the first time. The elementary gifted coordinator, coordinator of teaching and learning, and one elementary principal attended the meeting. The elementary gifted coordinator shared concerns with the identification process. The group reviewed screening and identification techniques other districts were using. They also studied the National Association for Gifted Children gifted program standards (NAGC, 1998). The idea of making these changes was very difficult for some, while not as difficult for others.

Within days following the initial meeting it was decided to disband the group and meet with the teachers separately at each building. Two meetings with grades 1 and 2 teachers were scheduled for March.

March

The first meeting was held at one building. With the input of grade 1 and 2 teachers, the overall plan was articulated and organized as a paragraph form. Two weeks later, a meeting was held at the other elementary building. Teachers' input was gathered; the articulated plan resulting from the Gifted Advisory Group was not shared with them. This group of teachers was extremely concerned about making any changes; therefore, presenting an articulated plan was not advisable. We scheduled another meeting with building representatives.

April

The elementary coordinator returned to the first building to present the articulated plan, using a flow chart, and provided a rationale for suggested changes. Each staff member was given a copy of the plan to review. We received very limited, but positive feedback.

May

The site-based decision making team at one elementary school approved the new identification process.

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Unfortunately, the staff at the other building was still very concerned about potential changes. A second meeting with them proved to be impossible to schedule. The school year ended with a split decision between the two buildings with no final determination of the district plan to identify new students.

Final Words

Program design and implementation are challenging, but rewarding tasks. Finding the identification procedure and program model that is right for your own district is vital, but it takes time. There can be many stumbling blocks along the way, both from fellow staff members and administrators. Our district is halfway there to implementing an identification process that should be more inclusive. We made baby steps in demonstrating how differentiation within the classroom can be done. We still need to work on professional development for this to be fully realized. As with any change within a school district, the key is to have administrative support and a few willing teachers who can help you model proposed changes. The ultimate goal is to provide programming and service opportunities matched to students' needs that are also linked to the overall goals and management of the district.

Documenting the progression of ideas and suggestions for possible changes in the current gifted and talented programs and services in this one district was certainly an effective method of using informal evaluation techniques to make decisions. Keeping a monthly log aided the decision-making process. Ideas and suggestions need to emerge from meetings with administrators, teachers, and parents to ensure a commitment to implementing the most defensible and appropriate opportunities for bright youngsters.

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Attention Deficit Disorders and Gifted Students: What Do We Really Know?

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Few current topics in education have engendered as much attention, concern, and passion as Attention-Deficit/ Hyperactivity Disorder (ADHD), particularly in gifted children. We recognize that giftedness is multifaceted and can be assessed in many ways other than a standardized IQ test. We will summarize and differentiate between what is *known* and what is *assumed* about ADHD in gifted students. (See our NRC/GT monograph for a complete analysis of this topic.)

ADHD: History, Definition, and Etiology

Attention-Deficit/Hyperactivity Disorder (ADHD) is a "syndrome," i.e., a grouping of symptoms that typically occur together. The core symptoms of ADHD are impulsivity, inattention, and hyperactivity (American Psychiatric Association, 1994). Estimates of the prevalence of ADHD among school age children vary but the median estimate across all definitions of ADHD and all types of studies is 2% in boys and girls combined (Lahey, Miller, Gordon, & Riley, 1999).

Family, adoption, and twin studies demonstrate that genetic factors are very important in ADHD, but environmental factors also play a significant role since heritability is less than 100%. Environmental factors, including premature birth, head injury, fetal alcohol syndrome, prenatal exposure to drugs of abuse, such as cocaine, lead toxicity, prenatal maternal smoking, and rare endocrine abnormalities can all cause the ADHD syndrome.

How Is ADHD Assessed and Diagnosed?

Four subtypes of Attention-Deficit/Hyperactivity Disorder (ADHD) are recognized in the DSM-IV: Predominantly Hyperactive/Impulsive, Predominantly Inattentive, Combined, and Not Otherwise Specified (American Psychiatric Association, 1994). To meet the criteria for one of the specific subtypes, at least 6 of the 9 symptoms of hyperactivity/impulsivity, or at least 6 criteria from the 9 symptoms of inattention must be present. (Combined type means both sets of criteria are met.) The symptoms must occur *in more than one setting*, must persist for *at least 6 months*, and must affect the individual "to a degree that is *maladaptive and inconsistent with developmental level*" (American Psychiatric Association, 1994, p. 83).

Under optimal circumstances, a team, *including a qualified clinician,* such as a pediatrician, family physician, psychiatrist, neurologist, or psychologist should make the diagnosis of ADHD because only these types of specialists can assess the physical and psychological problems that mimic ADHD. Information about these conditions is rarely available to school personnel, no matter how observant, experienced, or well trained.

For the majority of children with ADHD, symptoms become clear-cut when their behavior can be observed regularly and compared to other children over a sustained period. The classroom teacher, therefore, is typically the best person to make such comparisons, especially when systematic behavioral checklists or rating scales are employed. When the child in question is gifted, an individual who specializes in giftedness should also be included in the process to provide information about the child's behavior in comparison to other children of similar abilities (Silverman, 1998).

ADHD or Gifted: Either or Both?

In recent years, several authors (Baum, Olenchak, & Owen, 1998; Cramond, 1995; Freed & Parsons, 1997; Lind, 1993; Tucker & Hafenstein, 1997; Webb & Latimer, 1993) have expressed concern that giftedness is often misconstrued as ADHD and that the diagnosis of ADHD among the gifted population has run amok. We acknowledge for the purposes of this discussion that there are cases of mistaken diagnosis, although as of this writing, we have found ***no empirical data*** in the medical, educational, or psychological literature to substantiate the extent of this concern.

The lack of scientific data heightens our dismay over the wave of skepticism that appears to prevail about the existence of ADHD in gifted children. Specifically, we are concerned that the question "ADHD or gifted?" dismisses the possibility that the two conditions may coexist. Prudent attempts to avoid over-diagnosis must be balanced against a

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child's need for evaluation and treatment in the context of inevitable uncertainty when medical diagnoses are invoked.

In this context, Silverman (1998) notes that some professionals erroneously assume that a child who demonstrates sustained attention, such as a gifted child engaged in a high-interest activity, cannot have ADHD. It is understandable that an observer might discount the possibility of ADHD because from all appearances the child is so absorbed in a task that other stimuli fade into oblivion. While this state of rapt attention is often described as "flow" (Csikszentmihalyi, 1990), it can also be ascribed to "hyperfocus," which is a similar condition that individuals with ADHD frequently experience (Hallowell & Ratey, 1994).

Activities that are continuously reinforcing and "automatic," such as video or computer games or reading for pleasure, do not distinguish children who have ADHD from children who do not have ADHD, whereas effortful tasks do (Borcherding et al., 1988; Douglas & Parry, 1994; Wigal et al., 1998). By virtue of their giftedness, the range of tasks that are perceived as "effortless" is broader for gifted children, which is why their ADHD may be less apparent than in children who struggle more obviously and to lesser effect.

Recent work (Kalbfleisch, 2000) suggests that the gifted child with ADHD is particularly predisposed to exhibit this state of "flow" or "hyperfocus." While this can be a positive aspect of task commitment and a sign of motivation, it becomes a problem when the child is asked to shift from one task to another. Therefore, while cognitively this state can have positive aspects, behaviorally it can also cause problems (Moon, Zentall, Grskovic, Hall, & Stormont, in press). Furthermore, ADHD is not characterized by an *inability* to sustain attention, but rather by the inability to appropriately regulate the application of attention to tasks that are not intrinsically rewarding and/or that require effort. Such tasks are, sadly, characteristic of much of the work that is typically required in school, even in programs for gifted students.

While a misdiagnosis of ADHD is undesirable, diagnostic errors of omission are just as serious and may be even more prevalent among gifted students. This difficulty occurs when a student's over-reliance on strengths inadvertently obscures the disability. While emphasizing strengths may highlight a student's gifts and talents, it does not eliminate the reality of the condition and can, in fact, lead to a worse predicament in which the student distrusts his or her abilities because of the struggle to maintain them. On the other hand, if a student is allowed to acknowledge and experience the disability, he or she may learn appropriate compensatory or coping skills.

We believe that acknowledging that a child can be both gifted and have ADHD and that exploring the ways in which these conditions might interact in each child is a more productive way of looking at the problem than agonizing about a false dichotomy.

Given the realities of the co-existence of giftedness and ADHD, the question should not be "ADHD or gifted?" but rather "how impaired is this student by his/her ADHD?" Some children are able to compensate in most situations for their ADHD (and neither they nor their parents or teachers may be aware of it); others are seriously handicapped. The single most relevant element that must be considered in evaluating ADHD is the degree of *impairment* a child experiences as a result of the behaviors.

A child whose behavior causes him/her to be impaired academically, socially, or in the development of a sense of self, should be examined from a clinical/medical perspective to exclude potentially treatable conditions, even if the behavior may be similar to the traits typically ascribed to creativity or giftedness (Cramond, 1995) or to "overexcitabilities" (Piechowski, 1997; Silverman, 1993). However, this does not mean that every child who is impaired needs medication. As many authors have noted (Diller, 1998; Flick, 1998; Hartmann, 1993; Lerner, Lowenthal, & Lerner, 1995), non-medical interventions can be used within the school and home and should be tried before more intrusive interventions are employed.

The 1999 reauthorization of the Individuals with Disabilities Education Act explicitly recognized, for the first time, ADHD (and ADD) as disorders that should be classified as Other Health Impaired, when they adversely affect a child's educational performance. The reader is referred to www.chadd.org/legislative/govt.htm for further detailed information and relevant hyperlinks.

ADHD and Giftedness: Where Do We Go From Here?

Clearly, there is need for additional empirical research on giftedness and attention deficit disorders. Questions such as incidence of DSM-IV subtypes of ADHD among the gifted population must be investigated before other types of research can proceed. If such research were to show that current DSM-IV criteria identify significantly different

proportions of gifted students compared to the general population (over or under diagnosis), subsequent studies would be able to explore the sources and characteristics of the discrepancies. The availability of data would in turn facilitate and encourage the development of strategies for appropriate identification and curriculum. Contact the NRC/GT website (www.gifted.uconn.edu) if you know of identical twins (ages 5-16), one of whom presents characteristics of ADHD or ADD.

ADHD is not a defect that must be "cured." In fact, our experience of many gifted children with ADHD resonates with our colleagues' perceptions that the condition can not only inhibit, but enhance the realization of gifts and talents.

Educators of gifted students with ADHD face a formidable task in that they must provide opportunities for students to apply their strengths while ameliorating their deficits. Although the same might be said of any sound educational program, this is more daunting for gifted students with ADHD because of the striking disparities these conditions can create. Only through consistent attention, immeasurable creativity, and enduring patience by educators, parents, and students, coupled with substantive research, can these challenges be adequately addressed.

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