

# **LITERATURE SEARCH**

## **SUCCESSFUL EDUCATIONAL PROGRAMS AND STRATEGIES FOR HIGH ABILITY STUDENTS**

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**Prepared by Dr. Sherrill Martinez and Lue Ann Snider  
Planning and Research  
Kansas State Department of Education**

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Executive Summary

## EXECUTIVE SUMMARY

A literature search was conducted on successful educational programs and strategies for high ability students. High ability students are defined as those students who have exceptional abilities and are capable of high performance. High achieving students use their abilities to demonstrate high performance in one or more subject areas. The number of studies related to high achievers and high ability students was meager when compared to the number of studies related to low achievers, but some direction can be gained from them.

- ? Not all high ability students are high achievers and not all high achievers are achieving in line with their talents and abilities. School achievement fails to match achievement potential for more than half of the nation's gifted and talented students.
- ? High ability students who achieve in line with their potential are more likely to have high self-esteem, increased confidence and motivation, and decreased levels of anxiety.
- ? It is sometimes difficult to recognize exceptional talents or abilities due to a student's culture or family circumstances.
- ? Family, student, and school characteristics influence the achievement of high ability students, but no characteristic absolutely determines level of achievement. Each student's needs must be considered individually.
- ? Negative peer pressure related to being exceptionally bright can keep high ability students from doing their best.
- ? College preparatory tracks in high schools, even when enhanced with Advanced Placement courses, do not provide content that is challenging enough to maximize the talents and abilities of the nation's brightest students.
- ? Of the theories advanced for why high ability student in the United States fail to reach their potential, the ones that seem to have the most merit are the following:
  - ? The current reform movement with its emphasis on ensuring that all students master a common set of standards provides little or no incentives for assisting high ability students to advance beyond the standards.
  - ? Many educators believe that it is inequitable to provide additional resources to high ability students to enable them to become even more academically advantaged.
  - ? Curriculum in the United States is a mile wide and a half inch deep.
- ? In addition to being able to learn more rapidly and understand concepts at a higher level than other students once they attend class, high ability students typically know 35 to 50 percent of the curriculum before they even enter the class. In most classrooms, these students have a great deal of "free" time.
- ? A differentiated curriculum, ability grouping, moderate grade skipping, and special schools or programs do seem to have positive effects on the achievement of high ability students.
- ? The most common service offered to high ability students is a pull-out program at selected grade levels for a few hours per week. Usually, there is little continuity, attention to individual student talents, or in-depth study of topics in these pull-out programs. Therefore, study results show little or no advantage to participation.
- ? Learning preferences differ among the gifted and talented, depending on the intelligence area. They also differ between the gifted and non-gifted. In general, high ability students prefer independent study, discussion, and lecture to cooperative learning and small-group instruction.
- ? Curriculum experts in the United States are studying the curricula in higher achieving countries and making modification to the U.S. curriculum, based on the studies. Beginning School Mathematics is a promising program, resulting from an Association for Supervision and Curriculum Development (ASCD) study, which many believe could challenge all students. In this program, fewer topics are studied in more depth.

- ? High ability students are often not taught the importance of commitment, hard work, and positive attitude, unless their talents are in music or athletics.? It is easier for students to acquire these attributes when they are engaged in stimulating learning activities and are taught to evaluate and adjust their own learning processes/strategies.
- ? Staff who are skilled in instructing high ability students are extremely important to the success of these students, since curriculum adaptations are generally left up to the teachers.? Unfortunately, almost two-thirds of current elementary teachers have no training in teaching highly able students.

## SUCCESSFUL EDUCATIONAL PROGRAMS AND STRATEGIES FOR HIGH ABILITY STUDENTS

### Introduction

Compared to the volumes written about effective education programs for low achievers, little is written about effective programs for high achievers. It is true that, in general, best practices for low achievers work well for all student groups; however, high ability/high achieving students do have their own set of educational needs that should be considered when designing programs for them. Educational programs and practices to meet those needs will be discussed in this paper.

Although very few longitudinal studies have been conducted on high ability students and the effect of special services, some guidance is given by these existing studies. The studies indicate that differentiated curriculum does have a positive effect on achievement outcomes, but other factors, such as individual persistence and sense of mission, are very important; programs that are administered entirely within a heterogeneous classroom are less likely to result in increased learning than other program types; and quality programs that allow grade or subject acceleration produce positive learning effects and do not appear to hamper social or emotional development (ERIC, 1998).

When the brightest students live up to their academic potential, they enhance their chances of being admitted to and graduating from selective colleges, and they increase their chances of receiving higher job performance ratings and wages (College Board, 1999). Also, students who achieve in line with their potential are more likely to have high self-esteem, increased confidence, lower levels of anxiety in most contexts, and increased motivation to succeed. These are excellent reasons for identifying and providing services to these bright students.

### Who Are the High Achievers and Potential High Achievers?

A high achieving student demonstrates superior academic skills and subject mastery throughout school. Schools identify their high achieving students in several ways, such as grade point average, ranking in class, test scores, and academic competitions. Identifying *potentially* high achieving students is a bit more difficult, as is assigning labels to high achieving and potentially high achieving students. Are the students gifted, talented, or high ability?

The Federal government combines gifted and talented students into one definition: 'gifted and talented children are those identified by a professionally qualified person, who by virtue of outstanding abilities are capable of high performance. These are children who require differentiated educational programs and/or services beyond those normally provided by the regular school program in order to realize their contribution to self and society' (Public Law 91-230, Section 806). These children might be extremely capable in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. The Javits Gifted and Talented Education Act defines children with outstanding talent as those who show potential for performing at remarkably high levels of accomplishment when compared to others of the same age, experience, or background. Several researchers have studied the characteristics of students whom some call high ability and some call gifted or talented. Silverman and Waters conducted studies between 1981 and 1986 to determine the validity of their set of characteristics and found the following to be valid:

- ? Good problem-solving abilities;
- ? Rapid learning ability;

- ? Extensive vocabulary;
- ? Good memory;
- ? Long attention span;
- ? Sensitivity;
- ? Compassion for others;
- ? Perfectionism;
- ? High degree of energy;
- ? Preference for older companions;
- ? Wide range of interests;
- ? Excellent sense of humor;
- ? Early or avid reading ability;
- ? Ability in puzzles, mazes, or numbers;
- ? At times, seems mature for age; and
- ? Perseverance in areas of interest.

Aubrecht (1998) also lists unusually good memory, long attention span, avid reader, and learns quickly in a list of gifted characteristics. In addition, the following characteristics are identified by Aubrecht:

- ? Extensive knowledge of certain subjects or perhaps a wide variety of subjects;
- ? Advanced level of conceptualization in certain areas;
- ? Real understanding about a subject area, such as physics or cooking, instead of just a memorization of facts;
- ? High level of motivation to learn about certain subjects;
- ? Curious (asks seemingly endless questions);
- ? Independent; and
- ? Uneven development (may have wonderfully advanced abilities in math and be below age level in hand-eye coordination or in communicating an abstract idea verbally).

In this paper, the terms gifted, talented, and high ability students will be used synonymously. High achieving, high ability students are the students who take advantage of their abilities. In general, they are sensitive to the world around them, excel in one or more academic areas, are highly motivated to learn, and have realistic aspirations.

High ability students come from all socioeconomic and cultural groups. They are part of the population of virtually every school and need to be considered in the schools' educational program planning. For various reasons, many of these students are at-risk of not achieving to their full potential. Their achievement may be affected by physical, emotional, motivational, or social factors; or it may be affected by the students' learning disabilities. Too, their abilities may need special nurturing in order to develop, or their abilities may be hidden by cultural or other background variables. Therefore, not all high ability students become high achieving students. Even when their achievement is high, these students may not be achieving to their full potential. They may simply be achieving at a higher level than the majority of their peers. Teachers should be trained to value a variety of talents, to recognize talents in students early in the students' academic careers, and to implement programs that stimulate the growth of these talented students, if the students are to achieve at a level appropriate to their abilities. (Gagne, 1997).

### **What Factors Other Than Ability Affect Achievement?**

Differences in achievement are often attributed to a student's family background characteristics, and there is some validity in doing so. An exploratory analysis was conducted using the Third International

Math and Science Study (TIMSS) achievement and student and family characteristics data. Family and parental characteristics could account for about half of the difference in eighth-grade science and twelfth-grade math and science achievement. Also, students whose parents have less than a bachelor's degree were somewhat more likely to be low achievers than high achievers. Among students with parents with less than a bachelor's degree, 29 percent were low achievers and 20 percent were high achievers. In contrast, students whose parents have bachelor's degrees or higher were more likely to be high achievers than low achievers (44 percent vs. 12 percent).? Students whose parents have incomes of less than \$36,000 a year, or who have experienced three or more difficult situations at home, were more than twice as likely to be low achievers as high achievers. In contrast, students whose families have higher incomes, and those who have experienced no difficult situations at home, were 1? to 3 times as likely to be high achievers as low achievers. As the *New York Times Magazine* put it in a cover story entitled "What No School Can Do," "A child living in an inner city is in school for only so many hours. It's the rest of the day ? as well as the rest of the neighborhood ? that's the big influence, and the big problem."

Family characteristics can serve as flags for identifying and assisting students who are at-risk of not doing well in school. Early intervention programs for at-risk students, even high ability at-risk students, seem to help increase the likelihood of their success in school (Noble, 1999).? However, educators must remember that the existence of such things as poverty or troubled family situations or low parent education levels does not automatically mean a lack of interest in academic achievement. Families and students need to be dealt with individually and not within the context of stereotypes. The school needs to understand that the culture and circumstances of the family may make identification of gifts and talents more difficult. Thus, the school must consider a broader context, including cultural and environmental factors, to identify and meet the needs of these students (Hunsaker, et al., 1995).

In addition to family characteristics, students' characteristics and perceptions of their abilities affect their self-esteem and confidence and are related to educational achievement. The direct comparisons of gifted and nongifted students revealed that? gifted students, as a group, showed no major deficits in self-esteem (Hoge and Renzulli, 1991). However, not all high ability students also had high self-esteem. According to Noble (1999), students who see themselves as competent and effective and who have a realistic view of themselves and their abilities are over three times as likely to be high achievers as low achievers (45 percent vs. 13 percent). Students with a less positive view of themselves are more likely to be low achievers than high achievers (39 percent vs. 11 percent).? In addition, students who have a low level of motivation to succeed, or who have a high level of anxiety about their schoolwork or home environment, are five to six times as likely to be low achievers as high achievers (49 percent vs. 9 percent for motivation and 50 percent vs. 8 percent for anxiety). Students with higher levels of motivation and those with lower levels of anxiety are more likely to be high achievers than low achievers (33 percent vs. 19 percent and 31 percent vs. 19 percent, respectively).

Achievement differences are also related to student behavior.? Those who spend less than six hours per week at home doing homework, or no time each week reading for fun, are nearly twice as likely to be low achievers as high achievers (33 percent vs. 18 percent for homework and 29 percent vs. 19 for reading). In addition, students who spend no time each week on a computer at home are more than twice as likely to be low achievers as high achievers (36 percent vs. 16 percent).? The amount of time students spend on other activities outside of school is also related to educational achievement. Students who spend six or more hours each week watching television are somewhat more likely to be low achievers than high achievers (28 percent vs. 22 percent). In contrast, students who spend less time watching TV are more likely to be high achievers than low achievers.? Students who spend no time each week on school-related extracurricular activities are more than twice as likely to be low achievers as high achievers (37 percent vs. 14 percent). Students who spend more time on school-related extracurricular activities are more likely to be high achievers than low achievers (Noble, 1999). Gender is related to

academic risk behavior.? Sylvia Rimm (1999), author of *Gifted Kids Have Feelings Too*, says "one of the main problems girls have is perfectionism. They seem to be afraid to take risks unless they're sure of receiving an A.?" Students who are afraid to take risks are less likely to achieve in line with their potential.

Negative peer pressure associated with being very bright has changed the behavior of many high ability students.? This negative pressure gradually increases through the grades until it reaches its peak in middle school (Oreck et al., 1999). Students often do not want to be identified as a "brain," so they do well in school, but not exceptionally well, in order to be better accepted by their peers. In one study at three Midwestern high schools, researchers discovered that less than 10 percent of the students with a straight "A" average perceived themselves to be part of the "brain crowd." Moreover, less than one-third of the students nominated to this crowd by their peers perceived themselves to be "brains." The percentage was much lower among females (4 percent) than males (18 percent) but did not vary substantially by ethnic background.

Characteristics of districts and schools can affect student achievement.? Resource rich districts often have a more stable teaching force, high levels of involvement from parents, and high expectations for students.? Being a wealthy district, however, does not guarantee high student achievement.? Districts must use their wealth to support teaching and learning in order for students to be successful.? Curriculum, classroom instructional practices, and teacher engagement play an extremely important role in assisting each student to achieve to his/her potential? (TIMSS, 1999). A report issued by the National Association of Secondary School Principals identifies one main characteristic that successful schools have shared ? the belief that academics must receive priority over every other activity. Most schools that maintained excellence in academics sought to be excellent in everything else as well, but academics came first.? Many successful schools mentioned two other factors as important to maintaining high achievement among all student groups.? The first was reliance on a traditional liberal arts curriculum rather than on an overabundance of mini-courses and electives.? The second was the practice of grouping students by ability in as many subjects as possible (Singal, 1991).

### **What Theories Exist Concerning Under-Achievement of High Ability Students?**

Schools must develop a system to identify gifted and talented students that defines intelligence in a broad way and uses many techniques to identify and develop talent in children. ?A quality system --

- ? Looks throughout a range of disciplines for students with diverse talents;
- ? Uses many assessment measures to identify students in different talent areas and at different ages;
- ? Is free of bias;
- ? Can accommodate students who develop at different rates and whose interests may change as they mature;
- ? Identifies potential, even when it is not readily apparent in students; and
- ? Takes into account the drive and passion that play a key role in accomplishment (USDE, 1993).

A law enacted in Oregon to improve education for talented and gifted youngsters provides an example of such a system. The law requires the districts to --

- ? Identify gifted youngsters, using multiple methods and making a special effort to find gifted students from ethnic minorities, culturally different backgrounds, and economically disadvantaged

circumstances, as well as those with disabilities;

- ? Provide instruction to the child at the appropriate rate and level of learning;
- ? Assess and address the needs of each identified gifted child; and
- ? Allow parents to provide input on the gifted-education process as it affects their child.

Once gifted and talented students are identified, what is the best way to develop their talents?? Data from the Third International Mathematics and Science Study (TIMSS) raises questions about the school experiences of America's highest achieving students (Callahan et al., 2000). For more than half of the nation's gifted students, school achievement fails to match their abilities. Most gifted students are working at least four grades below that at which they could be working. While U.S. Secretary of Education Richard Riley and others have urged our high school students to take four years of challenging coursework, including physics and calculus, many of these courses do not provide content that is rigorous and challenging enough to bring our ablest students up to a level of performance achieved by their peers in other nations.? On the TIMSS, twelfth graders in the United States who were taking or had taken Advanced Placement calculus performed only at the international average and significantly higher than students in just five other countries; and the twelfth graders in the United States who were taking or had taken Advanced Placement physics performed below the international average and lower than twelve other countries.

Researchers have proposed several theories as to why high ability students in the United States fail to reach their potential.? One is that students in the U.S. do not spend as much time in learning activities as student in other countries.? Yet, U.S. fourth graders are assigned as much homework and U.S. eighth and twelfth graders are assigned more homework than students in other nations.? U.S. fourth-graders spend more time in mathematics instruction and U.S. eighth graders spend more time in mathematics and science instruction than do students in many of the other nations, including Germany and Japan (Callahan et al., 2000).?

Another theory is that educators resist developing special services for highly able children. Educators assume that the most able students are also the most motivated and need little structure; and that it is wrong to provide a curriculum for the gifted that could give them an even greater advantage over their peers.?? Thus, high ability students are offered programs where they have many choices and are left to learn at their own pace, regardless of their motivation level. Little thought is given to the fact that high ability students are not always more willing to exert the energy necessary to learn than average students are, and that they also need teacher guidance.

A third theory is that the current reform movement has had a negative impact on education of the brightest students.? The reform movement has brought with it pressure to organize students into heterogeneous classrooms and to use cooperative learning, whole-class instruction, uniform standards, and high-stakes testing.? Although there is research behind using these strategies for low achieving students, they are not the best strategies for high ability students. And, while multi-age grouping is used for struggling students, schools seldom use this technique for challenging the advanced students (Callahan et al., 2000). A major part of the reform movement is setting standards and then helping all students meet the standards.? When students enter a grade already exceeding the grade-level standards, teachers are not usually encouraged to take those students to the next level.? Therefore, the advanced learner is left to find things to do while the teacher works with students who have not mastered the standards.

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A fourth theory is that much of the curriculum in the U.S. is based on rapid, shallow coverage of a broad array of concepts. These concepts are often covered quickly in multiple grades. In other countries, students receive in-depth instruction on many fewer concepts. Because U.S. teachers are covering such a large number of concepts, they tend to do a poor job of preparing lessons on the various topics. Eighty-seven percent of the lessons developed by U.S. teachers, 13 percent of those developed by Japanese teachers, and 40 percent of those developed by German teachers were judged to be of low quality (Callahan et al., 2000).

Finally, researchers theorize that educators have made being identified as high ability the goal for many students. With the exception of students who are gifted athletes or musicians, gifted students are not taught about the importance of task commitment, hard work, and positive attitude in developing talents to their fullest (Callahan et al., 2000). Therefore, high ability students do only what is required to pass courses or receive good grades. One of the debates in education focuses on the Pygmalion effect – the possibility that labeling students as gifted or disabled changes teacher and students expectations about student performance. The debate has postulated that labeling struggling learners has negative effects. There is some evidence that recognition of great academic potential may also be a negative, when the recognition leads students to believe that ability alone results in achievement (Stevenson and Lee, 1997).

### **What is the Best Approach for Teaching High Ability Students?**

Lindsey and Faulkner (1995) hypothesized that groups of students of similar ability levels, but with different styles of learning engagement, would have significant differences in their levels of school achievement. They believed that students identified as having a more committed style of engagement, not necessarily those students with high IQ scores, would realize greater academic achievement. Two implications for school practice and program design were drawn from the study. The first is that it is important to help students develop self-regulated learning practices. Students are self-regulated when they are aware of their own learning styles and strategies and are able to select the correct strategies to complete a task successfully (Bandura, 1986). The second is that schools need to actively engage students in stimulating learning activities rather than in activities that merely enhance students' egos or demand minimal effort from them.

Most high ability students find school to be a positive environment offering many challenges and opportunities for personal recognition. These students are an important part of the social framework of the school and are expected to contribute significantly to the success of the school through their individual achievements. However, schools do not always provide high ability students with the best possible education. A Northwest Regional Educational Laboratory report says that the educational needs of gifted students too often go unmet. Districts fail to offer programs, offer them at a limited number of grade levels, and/or offer them for only a short time period each week. A recent article, "The 10 Worst Educational Disasters of the 20<sup>th</sup> Century: A Traditionalist's List," states that the number nine worst educational disaster is Failure To Challenge Gifted Students. *National Excellence: A Case for Developing America's Talent*, a 1993 U.S. Department of Education report, indicated that twenty years ago few programs existed for students identified as gifted and talented. By 1990, thirty-eight states served slightly more than two million identified students, but rarely did the programs exist over all the years of schooling. The 1995 "Gifted Education at a Crossroads" reported that 75 percent of schools with programs for gifted learners offer them to students in Grades 3 through 8, while only 50 percent

offer programs to students in Grades 9 through 12 or in Grades 1 and 2. It also documented a declining support for gifted education in many states. This decline has occurred in the face of the finding that "excellent" schools, "provide special programs for academically talented students. In carrying out their commitment to serve all students, these schools challenge their brightest students to develop their special talents to the fullest" (Purcell, 1995). In a report for the U.S. Education Department, three major areas were pinpointed where adaptations can and should be made in schools to challenge and motivate bright children: learning environment, curriculum content, and skills mastery. The following narrative and Table 1 summarize information from the report and from supporting research.

### Learning Environment

Gifted students seem to benefit from being placed with pupils of similar ability so that instruction is at the appropriate level and students stimulate each other to think and learn. However, according to an article by Ellen Winner (1996), the most common learning environment provided to the gifted at the elementary school level is a pull-out enrichment class. Typically, what this means is that children who qualify leave their classrooms once or twice a week for a class in which they are grouped with others like themselves, and in which they engage in problem-solving, projects, games, and field trips. Pull-out programs offer only a few hours a week of advanced instruction, they offer little continuity, and they do not allow students to study a topic in depth. Usually, only one kind of curriculum is offered to all gifted children, no matter what the students' gifts. Research on pull-out programs has shown them to be, in general, of little or no benefit. Moreover, what is offered in the best of these programs is what is known to be good curriculum and instruction for all children. Students of any ability level could benefit from the kinds of open-ended, project-based learning that goes on in the best pull-out, enrichment classes. Thus, these practices would be better placed in the general education classroom than in a pull-out program.

To avoid stigmatizing children and improve education, schools are moving away from pull-out programs that target special groups. However, serving high ability students only in the regular classroom often means that the needs of these students are forgotten, since teachers tend to concentrate on the needs of the average and struggling children. Research has found that when their needs are neglected, high ability students can suffer from boredom and frustration and may act out or drop out.

Other alternatives to pull-out programs for high ability students include honors classes, after school and summer mentor programs, ability grouping in full-time gifted classes, and moderate grade skipping. Grouping is the strategy of placing high achievers in one classroom with a teacher trained in gifted education. Some districts prohibit the grouping of gifted students. These districts believe that high ability students can learn as much from helping less able students as they can from being in classes of only high ability students (Weinig, 2000). Although students who struggle to learn can benefit from mixed-ability classes, they have plenty of positive role models without the highest ability students. The discrepancy in learning ability between students who struggle to learn and gifted students is too wide for role modeling (Winebrenner, 2000).

While many school programs that group children by ability have only a slight positive impact on the achievement of high ability students, other grouping programs help these children a great deal. Kulik (1992) says that highly talented youngsters profit from work in quality accelerated classes; thus, schools should try to maintain programs of accelerated work. Benefits are slight from programs that group children by ability but prescribe common curricular experiences for all ability groups; therefore, schools should not expect student achievement to change dramatically through use of these programs.

Flexible grouping within and between classes that reduces the achievement range of each class can provide many benefits to students and teachers. It can challenge students and allow new talents to emerge. Grouping can also make it easier for teachers to meet the needs of students in their classrooms. Grouping, used in conjunction with challenging instruction and high teacher expectations, can improve how teachers view their students with respect to ability and achievement, increase achievement scores, and increase the number of students identified as high achievers. Other positive effects of grouping high ability students are opportunities for more group specific staff development, emphasizing a variety of instructional strategies; a sense of responsibility for the achievement of high ability students; and increased opportunities for collaboration with colleagues and administration concerning the needs of high ability students (Gentry, 1999).

There are moderate advantages to students who are offered a special school program.? *A Five Year Longitudinal Study of Gifted and Talented Students: Grade 9 ? Post-High School Year* is a summary report which describes a study in Alberta, Canada, of gifted and talented students. Students attended either a special school setting or were integrated with regular students in their home schools. General findings were that students on the whole were successful, well-adjusted individuals; special school and mainstreamed students were comparable with respect to skills, abilities, and progress in academic, personal, and social domains; achievement of the two groups of students was generally comparable; students who had attended the special school were more likely to report satisfaction than mainstreamed students; and fewer special school than mainstreamed students reported social adjustment problems at the postsecondary level (ERIC, 1998).? As for grade skipping, studies of moderate skipping show that this kind of acceleration has beneficial effects and is not harmful socially or emotionally (Kulik, 1992).

Another key feature of an appropriate learning environment for high ability students is competent staff ? who can continually challenge? bright students. However, most teachers learn little about teaching gifted and talented students in preservice training programs. A study of a large, randomly selected group of inservice third- and fourth-grade teachers revealed that 64 percent had absolutely no training in teaching highly able students (Archambault et al.).

Although grouping, special programs, moderate grade skipping, and trained teachers have been shown to provide benefits to high ability students, some educators still believe that raising the standards in the schools for all children so that overall achievement rises, not just the achievement of the brightest, is the best solution for underachievement (Winner, 1996).? In high-achieving learning environments, the most advanced curriculum and instruction techniques are combined to support learning; teachers engage students in complex problem solving and exploring of ideas and issues, and classroom activities draw on students? culture, experiences, and knowledge. All students are engaged in authentic tasks and offered significant opportunities to develop knowledge. Teachers have high expectations for all students and provide an enriched curriculum. The environment allows students to discuss, argue, and analyze issues and concepts. The unique strengths of each student are nurtured, and talents are explored in a variety of formats.

### Curriculum Content

Gifted children in America tend to be instructed at a pace that is too slow and in a curriculum that is too narrow for their abilities. High ability students are often bored at school because they do not perceive a valued purpose to their school assignments.? Intellectually gifted and academically talented students are able to learn material rapidly and understand concepts deeply. They typically know 35 percent to 50 percent of the curriculum before they ever get to class. Therefore, gifted elementary students may have one-fourth to one-half of their class time ?left over? after they complete their work (NWREL, 1997).

Instead of this "left over" time being wasted, these students should have opportunities to function at more advanced levels of complexity and depth and to tie their interests into their schoolwork (Winebrenner, 2000). Keeping them challenged and learning to their capacity requires changes to regular school curriculum. However, curriculum adaptations for the ablest students are generally left up to classroom teachers instead of being the responsibility of the district or school. These teachers have often learned little about the needs of highly able learners in preservice and inservice training programs (Archambault et al.).

Discussions are occurring about how to reform the U.S. curriculum. Leland S. Cogan of the TIMSS National Research Center at Michigan State University noted that while Grade 8 has been viewed as a crisis point for U.S. students in math, it is impossible to reform Grade 8 without addressing what happens in Grades K-7. The Association for Supervision and Curriculum Development (ASCD) has studied Beginning School Mathematics (BSM) and how it aligns with the curriculums of the highest achieving countries, as identified by TIMSS. ASCD believes that BSM, an approach to math in the early grades, has the potential for raising the level of U.S. teaching and learning to that of high-achieving countries. BSM is focused on few topics to allow for more in-depth study. Four topics consume almost 100 percent of the teaching-learning activities. In contrast, the typical U.S. pattern focuses on 12 topics. Meaningful mathematical tasks are emphasized in BSM through challenging activities that engage students in constructing the process and the solution. The process usually involves two or more steps, and the aim is for the student to understand the mathematical purpose of the task. In BSM, more than 34 percent of attention is focused on the meaning of whole numbers, and about 30 percent is focused on whole-number operations (calculations). In contrast, about 7 percent of the usual U.S. curriculum is devoted to the meaning of whole numbers, and 33 percent is devoted to whole-number operations. In BSM, more than 20 percent of the curriculum is focused on structuring and abstracting, which requires higher-order thinking using complex procedures. In the usual U.S. math curriculum, none of the curriculum is. Performance expectations in BSM emphasize student knowledge of mathematical ideas, concepts, strategies, and procedures. Three kinds of performance expectations occupy almost 100 percent of the focus. About 50 percent of this focus is devoted to one performance expectation -- mathematical objects and their properties. This includes such concepts as number sense, three-dimensional shapes, and equations as number sentences. In contrast, the typical U.S. pattern spans more than 20 performance expectations. About 40 percent of the focus is on three kinds of expectations, and 60 percent is distributed among 17 other areas. The differences between the typical U.S. math curriculum and BSM reflects a pattern that is duplicated when comparing U.S. curriculum in other subject areas with the curriculum in higher achieving countries.

### Skills Mastery

An important aspect of skills mastery is that gifted students learn differently from their classmates in at least five important ways:

1. They learn new material in much less time than others.
2. They tend to remember what they have learned, making spiral curriculums and reviewing previously mastered concepts boring and unpleasant.
3. They perceive ideas and concepts at more abstract levels than others do.
4. They become keenly interested in specific topics and want to stay with those topics until they feel satisfied that they have learned as much as they possibly can about the topic.
5. They are able to attend to many activities at the same time (St. John's University's Center for the Study of Learning and Teaching Styles, 1996).

In a study of gifted adolescents from nine cultures, the gifted in several intelligence areas reported similar preferences for learning style ? but those preferences were different from the preferences of other gifted groups and from the preferences of the nongifted (Milgram, Dunn, and Price, 1993). The information that gifted adolescents in the same intelligence areas reveal almost identical learning styles across nine diverse cultures tends to corroborate Restak?s (1979) and Thies? (1979) data that almost three-fifths of variables in the Dunn and Dunn Learning Style Models (1992, 1993) are biological. When the Renzulli and Smith?s Learning Style Inventory was administered, it was found that academically able students exhibited preferences for independent study, discussion, and lecture; factors significantly different from the preferences of the general education students. Gifted adolescents prefer to learn either by themselves or with an authoritative teacher, not through cooperative learning and small-group instruction. Few gifted and talented students want to learn with classmates.

Although gifted students prefer to learn through certain modalities, usually kinesthetic and tactile, many are able to learn difficult material through kinesthetic, tactile, auditorial and visual instruction (Dunn, 1989; Milgram, Dunn, and Price, 1993). On the other hand, lower ability students who prefer one modality can usually only master difficult information through that modality (Dunn, 1988; Dunn, Beaudry, and Klavas, 1989; Kyriacou and Dunn, 1994; Milgram, Dunn, and Price, 1993).? Thus, teachers might be led to believe that the high ability students are benefiting sufficiently from instruction when, in fact, they would be doing much better if instructed through their favored modality. Even in the primary grades, gifted first- and second-graders revealed higher achievement and attitude test scores when learning in accordance with their sociological preferences (Perrin, 1984).

Of the gifted and talented tested for hemispheric processing style, 19 percent were analytic, 26 percent were global, and 55 percent were integrated processors who functioned in either style when interested in the curriculum. Although gifted students can be global or analytic learners, both textbooks and teachers? styles tend to favor analytic. Emphasis on certain techniques, such as a thematic approach to curriculum, is likely to work for global students but handicap analytic students. Thus, until teachers instruct each group of processors differently, or students learn to teach themselves, conventional schooling will continue to help some master and inhibit others from mastering academic skills (Dunn and Dunn, 1972).

**Table 1: Major Adaptation Areas for High Ability Students**

<b>Learning Environment</b>		
<b>Description</b>	<b>Advantages for High Ability Students</b>	<b>Disadvantages for High Ability Students</b>
Pull-out Programs	Allow students to work with other high ability students in areas of interest	Offer only a few hours of instruction per week and little continuity; cause children to be labeled; often provide the same curriculum to all children, regardless of? talent
Grouping	Allows high ability students to challenge each other and to work at an accelerated pace; by reducing the range of ability in the classroom, allows teachers to better meet the needs of each student	When common curricular experiences are provided to all ability groups, there is little or no positive impact; labels and separates students
Grade Skipping	Not harmful socially or emotionally, when done in moderation; allows students to accelerate in areas of talent	Can cause social and emotional trauma when done to extreme
Special Programs/Schools	Help students be more satisfied with their schooling experiences and be better adjusted at the postsecondary level	Little difference is realized with respect to skills and abilities in academic, personal, and social domains
Regular Classrooms	Prevent the labeling of students and the separation of high ability students from other classmates;? can be beneficial when the most advanced instructional techniques are used and all students are exposed to an enriched curriculum	Teachers not usually trained to work with high ability students, so needs often ignored; students can become bored and frustrated
<b>Curriculum</b>		
<b>Description</b>	<b>Advantages for High Ability Students</b>	<b>Disadvantages for High Ability Students</b>
Broad array of standards, spiraled through the grade levels; same curriculum for all	Can serve as role models or assist classmates	Are bored with reappearance of material in multiple grades; see little relevance in curriculum, since topics are seldom explored in depth
Focus on few standards, with in-depth study of each; different topics at each grade level; differentiated curriculum, depending on ability level	Are able to gain real understanding of standards through exploration of relevant topics and construction of knowledge; all students can work at own ability level	None, if activities directed by skilled instructor
<b>Skills Mastery</b>		
<b>Description</b>	<b>Advantages for High Ability Students</b>	<b>Disadvantages for High Ability Students</b>
Schools and teachers	Are often rewarded with high grades and	May have mastered half of standards at

<p>expected to assist all students to master a broad array of standards</p>	<p>extra credit</p>	<p>grade entrance; learn fast and often have too much of their class time left with little to do; needs often go unmet; often taught through methods that do not match their learning preferences</p>
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## Concluding Remarks

According to Zeichner (1995), the literature suggests that the key elements to enable all students to achieve to high standards are high expectations for all students, cultural congruence in instruction, teacher knowledge and respect for cultural traditions, and teaching strategies that promote meaningful participation. There must also be equity in resource allocation, recruitment of quality students into teacher preparation programs, and positive attitudes about the impact schooling can have on student learning. These are important elements, but high ability students may need more.

In order to realize their potential, gifted and talented students require opportunities to pursue advanced level work, be exposed to higher level thinking skills, pursue a self-selected interest, work in ability/interest groups, move to a higher grade for specific subject area instruction, and work in advanced curriculum areas (Archambault, et al., 1993). These opportunities often do not materialize when high ability students spend most or all of their school days in heterogeneous classrooms. Differentiated learning for high-ability students in heterogeneous classrooms is as important as it is for other children. However, although students who are not learning successfully are targeted for special attention, high achieving students seldom are. Since capable students have the ability to score high on assignments, their need for special attention is frequently overlooked. Also, many educational leaders have misunderstood research on role modeling to mean that some gifted students should be present in all classrooms to facilitate forward progress for other students. Although this practice may provide some benefit to other students, it does not offer high ability students the assistance they need to reach their potential.

Some highly capable students participate in a variety of activities and appear to be high achievers, but are at risk of underachieving if they cannot focus their learning. Unsupervised "free" time does not help them gain focus. The most important needs of gifted students are to have regular opportunities to demonstrate what they already know, to receive full credit for content they have already mastered, and to spend their own learning time on challenging activities that accelerate and enrich the regular curriculum. Highly talented youngsters also profit greatly from an enriched curriculum designed to broaden and deepen their learning. Often, to reward high ability students for doing well in heterogeneous classes, they have been offered extra credit. Most students eligible for extra credit are those who have more than enough earned credit. The practice of offering extra credit should be replaced with approaches that can motivate gifted students to become focused, enthusiastic learners (Winebrenner, 2000).

Teachers should arrange to spend time with high ability students. It is important that these students not feel abandoned by the teacher and that they learn that everyone needs help on challenging tasks. They should also be encouraged to take risks and to take pride in their achievement. As part of their regular

lesson planning, teachers should be taught to design alternative learning experiences to provide differentiated opportunities to high ability students in terms of content, learning processes, and learning environment. The content must be different because it must move students beyond grade-level standards and relate to students' interests. The learning processes called upon must be different because they must provide depth and complexity appropriate to these students' learning abilities. The learning environment must also be different, allowing students to pursue interests outside the regular classroom, work more independently on self-directed projects, and work with students with similar interests and talents (Winebrenner, 2000).

Very importantly, high ability students must be nurtured and enabled to develop the habits of mind that allow them to live happy, successful lives. In the 1993 longitudinal study entitled *The Beyonders in a Thirty Year Longitudinal Study of Creative Achievement*, characteristics such as love of one's work, persistence, purpose of life, love of challenge, high energy level, and a sense of mission were more related to being a successful adult than creative ability, intelligence, and high school achievement (ERIC, 1998).

## References

- Archambault, Francis X. et al. "Classroom Practices Used with Gifted Third and Fourth Grade Students," *Journal for the Education of the Gifted*, vol. 16, 1993; and Karen Westberg et al., "The Classroom Practices Observation Study," *Journal for the Education of the Gifted*, vol. 16, 1993.
- \_\_\_\_\_. "Regular Classroom Practices with Gifted Students: Results of a national survey of classroom teachers." Storrs, CT: The National Research Center on the Gifted and Talented, 1993.
- Aubrecht, Lyn. "How to Tell if Your Preschool Child is Gifted: The Signs to Look For." *Tampa Bay Family Magazine*, 1998.
- Bandura, A. "Social Foundations of Thought and Theory." Englewood Cliffs, NJ: Prentice Hall, 1986.
- Callahan, Carolyn M. et al. "TIMSS and High-Ability Students: Message of Doom or Opportunity for Reflection?" *Phi Delta Kappan*, June 2000.
- Cogan, Leland S. TIMSS, National Research Center at Michigan State University, 1999.
- College Board. *Reaching the Top*. College Entrance Examination Board, 1999.
- Dunn, Rita. "How to Implement and Supervise a Learning Style Program." Association for Supervision and Curriculum Development, 1996.
- Gagne's, Francoys. "Gifted and Talented." Washington, 1997.
- Gentry, Marcia Lynne. *Promoting Student Achievement and Exemplary Classroom Practices Through Cluster Grouping: A Research-Based Alternative to Heterogeneous Elementary Classrooms* (RM99138). Storrs, Ct: The National Research Center on the Gifted and Talented, University of Connecticut, 1999.
- Hoge, Robert D. and Joseph S. Renzulli. *Self-Concept and the Gifted Child*. The National Research Center on the Gifted and Talented, Connecticut, 1991.
- Hunsaker, S.L., et al. *Family influences on the achievement of economically disadvantaged students: Implications for gifted identification and programming* (RM95206). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut, 1995.
- Kulik, J.A. *An analysis of the research on ability grouping: Historical and contemporary perspectives* (RBDM 9204). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut, 1992.
- Laboratory at Brown University. *Education Notes*. Volume 2, No. 1, April 2000.
- Lindsey, J. and A. Faulkner. Report of a longitudinal study regarding the learning approaches and motivational patterns of academically highly able students in a secondary or middle school setting, 1995.
- Noble, Julie. Act Information Brief: 99-2, 1992.

- Northwest Regional Educational Laboratory. "The Quiet Crisis." Fall 1997.
- Oreck, Barry, Susan Baum, and Heather McCartney. "Artistic Talent Development for Urban Youth: The Promise and the Challenge," *Champions of Change: The Impact of the Arts on Learning*, 1999.
- Purcell, Jeanne H. "Gifted Education at a Crossroads: The Program Status Study," *Gifted Child Quarterly*, vol. 39, 1995.
- Silverman, L. K., Chitwood, D. G., & Waters, J. L. "Young gifted children: Can teachers identify giftedness?" *Topics in Early Childhood Special Education*, 6 (1), 23-28, 1986.
- Singal, Daniel J. "The Other Crisis in American Education." *The Atlantic Monthly*, November 1991.
- Stevenson, Harold W. and Shin-ying Lee, *International Comparisons of Entrance and Exit Examinations: Japan, United Kingdom, France, and Germany*, U.S. Department of Education, Washington, D.C., 1997.
- TIMSS Report. A First Look at What We Can Learn from High Performing School Districts: An Analysis of TIMSS Data from the First in the World Consortium, August 1999.
- U.S. Department of Education. *National Excellence: A Case for Developing America's Talent*. Office of Educational Research and Improvement, Washington, D. C., 1993.
- Weinig, Kenneth M. "The 10 Worst Educational Disasters of the 20<sup>th</sup> Century: A Traditionalist's List." *Education Week*, June 14, 2000.
- Winebrenner, Susan. "Gifted Students Need an Education, Too." *Educational Leadership*, September 2000.
- Winner, Ellen. "The Miseducation of Our Gifted Children." *Education Week*, October 16, 1996.