

Reis, S. M., & Renzulli, J. S. (2011). Challenging gifted and talented learners with a continuum of research-based interventions strategies. In M. A. Bray & T. J. Kehle (Eds.). *The Oxford handbook of school psychology* (pp. 456–482). Oxford University Press.

Challenging Gifted and Talented Learners With a Continuum of Research-Based Interventions Strategies

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Abstract

An overview of definitions of giftedness, special populations of gifted and talented children, methods of identification, and a continuum of services are summarized in this chapter. These services include organizational strategies (such as instructional grouping options), instructional strategies (such as acceleration and enrichment options), and a variety of talent development opportunities that should be included in a continuum of services that will engage and challenge all gifted and talented students. Also included in this chapter are some social and emotional challenges that may affect gifted and high potential children, such as the potential underachievement of children who do not encounter sufficient challenge in school. The chapter ends with a summary of research about the effectiveness of grouping, instructional, and talent development strategies, as well as recommendations for the creation of a continuum of services in each school district that will challenge and engage all students.

Introduction

The study of gifts and talents in children continues to fascinate teachers and educators who watch with wonder as a 3-year-old reads without any instruction, or a child composes elegant poetry, or a young person writes compelling original music. This chapter addresses three questions that have long intrigued and perplexed researchers, psychologists, educators, and parents interested in developing the gifts and talents of high potential children: how do we define giftedness in children; how do we identify giftedness or the potential for giftedness in these students; and what interventions work best to help develop the gifts and talents of students with high potential? In an ideal world, researchers and educators would respond to each question with definitive answers, citing research-based strategies that work in diverse school settings; however, in the real world we know that personality, environment, school, and home factors interact with potential and the ability to translate that potential into demonstrated gifts and talents (Renzulli, 1978, 1986, 2006). Accordingly, the reality is somewhat more complex.

Current research shows that some children who are identified as gifted and talented excel in school, attend competitive colleges, complete their bachelor's degree with honors, head to outstanding graduate schools where they excel, and pursue distinguished careers in which they make a difference in the lives of others (Hébert, 1993; Westberg, 1999). Other research demonstrates that some gifted students, who excel in elementary and middle school, underachieve in high school and eventually drop out of school (Reis & McCoach, 2000; Reis, Hébert, Díaz, Maxfield, & Ratley, 1995). One recent study using a national database found that

5% of gifted students drop out of high school (Renzulli & Park, 2000). Another study shows that half of the identified gifted students in an urban high school were underachieving by the time they entered their sophomore year (Reis, Hébert et al., 1995). Research about gifted and talented learners points to the great diversity among this heterogeneous group of young people (Neihart, Reis, Robinson, & Moon, 2001), and the fact that many do not realize their potential, in part, due to school factors that contribute to their underachievement, halted development, and failure to develop gifted behaviors (Reis & McCoach, 2000).

Traits, Characteristics, and Definitions of Giftedness

Despite the diversity in this population, research suggests that some traits occur with greater frequency in gifted and high potential learners than in the general population (Frasier & Passow, 1994; Renzulli, 1986). In this chapter, some of these traits are discussed, as are the definitions of giftedness that accompany these traits. However, it is not our intention to provide an absolute definition or checklist of students as either “gifted” or “not gifted;” rather, we will discuss some characteristics that may be present in some gifted and high ability students, and illustrate how these characteristics will vary based on a variety of factors, including gender, sociocultural group, the presence of a hidden or overt disability, age, and/or level of achievement. Our hope is that by discussing the heterogeneity of gifted and talented learners, this chapter will enable both educators and psychologists to understand that more diverse and flexible conceptions of giftedness and talent, extending beyond IQ, must be considered in a broad spectrum of children and young adults. Our ultimate goal is to help educators develop a continuum of services that will contribute to the development of the gifts and talents of children and young people. We begin the chapter with two case studies that illustrate the diverse behaviors demonstrated by young people identified as gifted and talented, and the need that exists for talent development opportunities for students like them.

Keisha

Keisha was a shy, quiet fifth grader who had been identified as gifted in second grade, in a school that used a cutoff on aptitude scores to qualify for the gifted program. An avid reader and introvert, she displayed few characteristics related to most traditional notions of giftedness. She was so quiet that her teachers failed to see the high level of creative potential which she subsequently displayed in school and life. Her verbal skills were hard to identify because she was shy. Although she read avidly, she did not initially appear to display verbal precocity. Her current teachers had not observed any indications of problem solving, reasoning, insight, or other commonly acknowledged characteristics of academic giftedness. Keisha was primarily known for being quiet and kind, and an advanced reader who did not like to discuss or share what she was reading, perhaps due to her shyness.

Keisha did well in school, but was not considered the most advanced student in any of her classes between second and fifth grade. In the beginning of fifth grade, however, she developed a closer relationship with her new classroom teacher, who had some coursework in gifted education and talent development and understood Keisha’s shyness. Her teacher spent time getting to know her, found books in her interest area, took an interest in what Keisha was doing at home, and asked Keisha about some of her aspirations and hopes for the future. Over

the next few months, Keisha's affect and attitudes in school changed, and she began to excel in all content areas. She became involved in an in-depth independent study project and started, with the support of her teacher, a book drive in the school for a nearby community center for children of poverty with little access to books at home. Interestingly enough, few of the characteristics that Keisha displayed when she was working on her book project had been apparent to her teachers prior to this time. The circumstances that emerged with her new teacher and her book project gave Keisha the opportunities, resources, and encouragement (Renzulli & Reis, 1997) to actively demonstrate and further develop her latent gifts and talents.

Peter

Although he had been identified as gifted in third grade, Peter's schoolwork had frustrated both his parents and teachers for years. Always a child of remarkably high potential, his grades fluctuated in elementary, middle, and senior high school. In elementary school, Peter was identified as gifted in a district that required an IQ of above 130, in addition to evidence of high achievement, for entrance to the gifted program. He enjoyed discussing his ideas with others and was highly verbal, but had poor work habits in required subjects in technology and math, his two areas of interest. As the years progressed, Peter's work became less and less impressive, and his teachers questioned his identification as gifted. His writing was considered below average, and the only class in which he consistently excelled was math.

Peter disliked reading anything that was unrelated to his interests. His grades varied, from top marks in math and technology to failing grades in subjects that did not interest him. Although he took advanced math classes in middle and high school, and achieved a near perfect score on the math section of the SAT, during his junior year of high school, Peter had become an "underachiever" because of his varying attitudes toward school. He rarely displayed characteristics of a gifted student in classes in which he did not have an interest. His technology and math teachers realized his potential and saw his talents in problem solving, persistence, and creativity. Few other teachers noted any positive characteristics, and he continued to underachieve in school. Over time, a pattern emerged. If Peter liked his teacher, he would do well in class, regardless of the content. If Peter liked the content of the class, but not his teacher, he would do enough to get by with marginal grades, usually Cs. But if Peter did not like either his teacher or the content, or the content was well below his ability level, Peter usually failed the class or earned a grade of D. He always did well on his exams, even when he had done none of the assigned work in class. He simply lost credit for the homework and class work that he failed to complete.

The problem was not that Peter was lazy. In fact, his parents usually had to plead with him to go to bed on time because he was reading books about artificial intelligence, or pursuing his own interests, designing software and building computers. In his senior year, Peter got recruitment letters from the best colleges in the country because his SAT scores were nearly perfect but, unfortunately, he did not graduate from high school, failing both English and history. He did not like his teachers, and the work was too easy in the lower-track classes to which he had been assigned because of his lackluster effort and low grades in earlier years. Not graduating from high school was, for Peter, the lesser of two fates. The worse fate, in his opinion, was pretending to be interested in boring, non-inspiring classes taught by teachers he believed did not

care about him or their teaching practices. Despite the many creative and motivational characteristics that Peter displayed at home or in content areas in which he had a sincere interest, his teachers failed to see the traits associated with his gifts and talents.

Characteristics and Operational Definitions of Giftedness and Talents

These case studies illustrate the difficulty in relying on one definition to describe diverse gifted behaviors. The overlapping definitions of giftedness in educational research underlie the complexity of defining with absolute certainty who is and who is not gifted (Sternberg & Davidson, 2005). In describing this heterogeneous group of learners, current educators may interchangeably use more expanded definitions of giftedness and talent. This was not always the case, for in decades past, researchers and psychologists, following in the footsteps of Lewis Terman, equated “giftedness” with high IQ (Terman, 1925). In practice, this legacy survives to the present day, with some researchers, educators, and parents equating a high psychometric score on an intelligence test as equivalent to “giftedness.” However, more recently, most definitions of giftedness or talent have become more multidimensional, and include the interplay of culture and values on the development of talents and gifts (Sternberg & Davidson, 2005). The most current research offers multiple perspectives on conceptions of giftedness by many different researchers ranging from general, broad characterizations to more targeted definitions of giftedness identified by *specific* actions, products, or abilities within domains (Sternberg & Davidson, 1986; Sternberg & Davidson, 2005). This research, conducted during the last few decades, supports a broader conception of giftedness that includes various combinations of multiple qualities such as motivation, self-concept, and creativity, in addition to intellectual potential (Sternberg & Davidson, 2005).

The Federal Definition, The Renzulli Three-Ring Definition, and Gagne’s Conception

Following the seminal research conducted by Terman and his associates almost a century ago, researchers have expanded upon this one-dimensional conception of giftedness as equating with high IQ. A consensus in more recent research defines giftedness as a multidimensional construct incorporating a variety of traits, skills, and abilities. This expanded conception is particularly evident in two separate scholarly examinations of giftedness in Sternberg and Davidson’s (1986, 2005) edited volumes of conceptions of giftedness, in which most contributors propose conceptions of giftedness that extend beyond IQ. This philosophical stance is an even stronger theme in most second edition chapters (Sternberg & Davidson, 2005) in which characteristics such as rapid learning as compared to others in the population, attention control, memory efficiency, perception, desire to develop one’s gifts, and task commitment are all proposed as aspects of giftedness (Heller, Perleth, & Lim, 2005; Reis, 2005; Renzulli, 2005).

In research on characteristics of diverse groups of gifted and talented learners, Frasier and Passow (1994) synthesized traits, aptitudes, and behaviors identified by researchers as common to gifted students (Table 1), noting that these basic elements of giftedness appear to be similar across cultures (though each is not displayed by every student). Their research found that these traits, aptitudes, and behaviors may be manifested in various ways in different students, and educators should be especially careful in attempting to identify these characteristics in students from diverse backgrounds (i.e., economically disadvantaged, ethnically or racially diverse, etc.),

as specific behavioral manifestations of the characteristics may vary across cultures (Frasier & Passow, 1994).

Table 1. Frasier & Passow’s common attributes of giftedness

• motivation	• advanced interests
• communication skills	• problem-solving ability
• well-developed memory	• inquiry
• insight	• reasoning
• imagination/creativity	• sense of humor
• advanced ability to deal with symbol systems	

Adapted with permission from The National Research Center on the Gifted and Talented.

Renzulli’s Three-Ring Conception

One of the earliest theorists to propose a multifaceted conception of giftedness was Renzulli (1978), whose research resulted in his three-ring conception (Figure 1). The theory, which has gained widespread research and popular appeal, supports the idea that “gifted behaviors” result from the interaction among distinct intrapersonal characteristics, as outlined in the excerpt below.

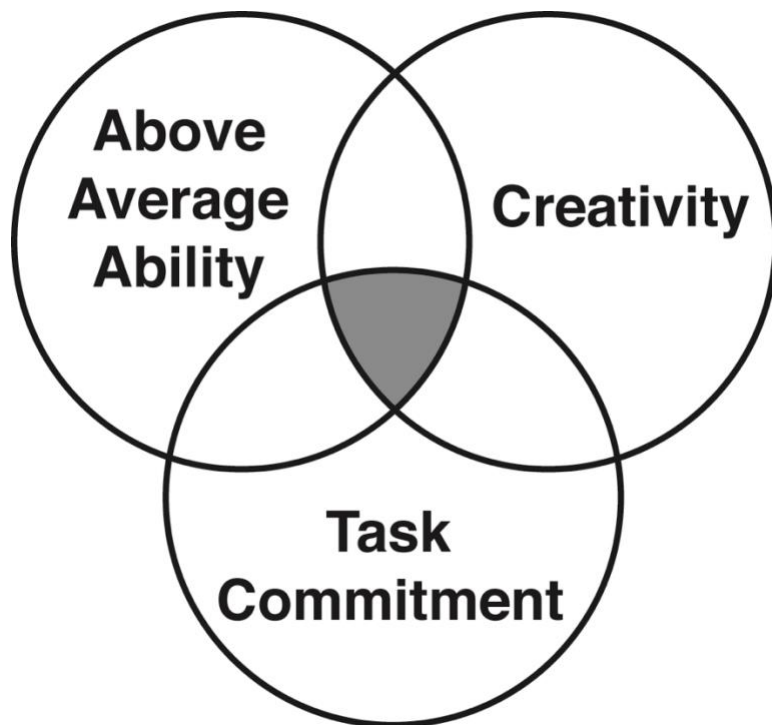


Figure 1. Three-Ring Conception

Gifted behavior consists of behaviors that reflect an interaction among three basic clusters of human traits—above average ability, high levels of task commitment, and high levels of creativity. Individuals capable of developing gifted behavior are those possessing or capable of developing this composite set of traits and applying them to any potentially valuable area of human performance. Persons who manifest or are capable of developing an interaction among the three clusters require a wide variety of educational opportunities and services that are not ordinarily provided through regular instructional programs. (Renzulli & Reis, 1997, p. 8)

Characteristics that are often manifested in Renzulli’s three clusters are presented in Table 2.

Table 2. Taxonomy of behavioral manifestations of giftedness according to Renzulli’s “Three-ring” definition of gifted behavior

Above Average Ability (general)

- high levels of abstract thought
- adaptation to novel situations
- rapid and accurate retrieval of information

Above Average Ability (specific)

- applications of general abilities to specific area of knowledge
- capacity to sort out relevant from irrelevant information
- capacity to acquire and use advanced knowledge and strategies while pursuing a problem

Task Commitment

- capacity for high levels of interest and/or enthusiasm
- hard work and determination in a particular area
- self-confidence and drive to achieve
- ability to identify significant problems within an area of study
- setting high standards for one’s work

Creativity

- fluency, flexibility, and originality of thought
- open to new experiences and ideas
- curious
- willing to take risks

From Renzulli & Reis, 1997. Adapted with permission of Creative Learning Press.

Other Definitions of Giftedness

The United States Department of Education’s current federal definition of giftedness also represents a multidimensional approach that is widely used in school districts and states across the country (1993):

Children and youth with outstanding talent perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment. These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. They require services or activities not ordinarily provided by the schools. Outstanding talents are present in children and youth from all cultural groups, across all economic strata, and in all areas of human endeavor. (U.S. Department of Education, 1993, p. 26)

Francois Gagné's conception of giftedness differentiates between giftedness and talent, hypothesizing that talent is a skill within a single domain that must be systematically developed, as opposed to giftedness, which represents innate abilities in and across multiple domains (Gagné, 1985, 1999, 2000). Gagné proposes that giftedness is the manifestation of natural abilities to a level that places the student in the top 10% of their chronological peers. These abilities, often called aptitudes or gifts, appear in at least one of five natural aptitude domains: intellectual, creative, socioaffective, sensorimotor, and others. Talents, as defined in this model, emerge from the systematic development and nurturance of these aptitudes into skills that characterize a particular field. Similar to Renzulli, Gagné's definition of giftedness focuses on the role that talent development plays in transforming natural abilities into systematically developed skills, as he discusses the role played by interpersonal factors, environmental factors, and chance (Tannenbaum, 1983, 1986).

There is no single agreed upon definition of giftedness at the national or even the state level. Thus, the research-based interventions discussed in this chapter will differ based on various conceptions of giftedness. For example, if intellectual giftedness with characteristics such as attention control, memory efficiency, advanced reasoning, and rapid processing and retrieval of information are used as the basis for identification, the use of acceleration and advanced content would be an appropriate program choice. Characteristics and definitions should always lead to corresponding identification procedures, as well as the program services selected, a concept we call internal consistency.

Creativity and Creative Productive Definition, of Giftedness and Talent

Creativity is an area of interest to many scholars, but there is no universally accepted definition of creativity (Treffinger, Young, Selby, & Shepardson, 2002), and characteristics of creativity vary within and among people and across disciplines (Renzulli, 1978). Academic giftedness and creative giftedness may be two separate concepts, as per Sternberg and Lubart's assertion that the "academically successful children of today are not necessarily the creatively gifted adults of tomorrow" (1993, p. 12). Individuals with high intelligence may or may not have high creative ability as well (Renzulli & Reis, 1997). Some evidence, however, suggests that a relationship exists between the constructs. A "threshold concept" discussed by MacKinnon in 1978, includes a base level of intelligence (an IQ of about 120) that is essential for creative productivity. Beyond that threshold, no relationship between creativity and intelligence appears to be measured by IQ tests (Sternberg & Lubart, 1993).

Teachers try to identify the potential for creative productivity of children in general areas, as children with high potential for creativity often demonstrate fluency, flexibility, originality, and elaboration, as well as the abilities to think in creative or divergent ways (Guilford, 1950; Torrance, 1988). What defines a child with high creative potential? Gardner (1993) defines a creative individual as one who “*regularly* solves problems or fashions products in a *domain*, and whose work is considered both novel and acceptable by knowledgeable members of a field” (p. xvii). Creativity should not be regarded as a construct in the mind or personality of an individual; rather it is something that emerges from the interactions of intelligence (personal profile of competences), domain (disciplines or crafts within a culture), and field (people and institutions that judge quality within a domain; Gardner, 1993).

What “resources” and environments might children need in school to enable their gifts and talents to be nurtured and developed? We believe that the use of certain enrichment opportunities included in our work on the Schoolwide Enrichment Model (Renzulli & Reis, 1997) can result in the creation of an environment that nurtures creativity in children. Teachers who want to develop creatively gifted children enable them to create, formulate, and plan ideas and projects, while also processing information through abstract thinking and generalizing (Renzulli & Reis, 1997). Teachers and parents who hope to develop creativity in children must nurture a belief in self and creative ideas; this should be done in an environment in which children are allowed to work on creative tasks, and one in which creativity is rewarded and creative ideas are celebrated. Our work (Renzulli & Reis, 1985, 1997) focuses on a developmental three-ring conception of giftedness, and the ways in which we nurture students’ interests, learning, and product styles. Our goal is to provide opportunities, resources, and encouragement for children to develop these potentials and creative products, through a continuum of services (Renzulli & Reis, 1997). A series of broad and diverse opportunities described later in this chapter in the Schoolwide Enrichment Model (Renzulli & Reis, 1997) are considered to be positive forces in the development of creative potential, and academic gifts and talents, in children.

Special Populations of Gifted Learners

The last two decades have been marked by an increasing interest in diverse gifted students (Briggs, Reis, & Sullivan, 2008; Tomlinson, Ford, Reis, Briggs, & Strickland, 2004). These students may include children from ethnic, racial, and linguistic minorities, as well as those from economically disadvantaged homes. Literature and research conducted on gifted girls (Reis, 1998), gifted underachievers (Reis & McCoach, 2000), gifted gay, lesbian, or bisexual students (Cohn, 2003), and gifted students with disabilities (Baum & Owen, 2004) suggests that the underrepresentation of these groups in gifted programs is consistent and pervasive. With increased awareness of this issue, some policymakers and educators have sought ways to ensure that diverse groups of gifted students receive opportunities similar to those that other gifted students enjoy (Ford, 1998; Ford & Harris, 1999; Tomlinson et al., 2004). Complicating the process, however, is the reality that many current identification and selection procedures may be ineffective and inappropriate for the identification of these young people (Briggs et al., 2008; Ford, 1998). Certainly, limited referrals and nominations of culturally, linguistically, and economically diverse (CLEO) students affect their low placement in programs (Ford, 1998; Ford & Harris, 1999; Ford, Howard, Harris, & Tyson, 2000; Frasier & Passow, 1994; Briggs et al., 2008).

Part of the problem may be that gifted students in these populations demonstrate characteristics that are different from those of “typical” gifted students (Briggs et al., 2008; Ford, 1998). Recognizing the need to acknowledge characteristics of different cultures in the identification of talent among diverse groups, Ford (1998) urged educators to avoid assessments that are culture-blind when working with students of color and, instead, favor identification procedures that may be more sensitive to cultural differences. In this section of the chapter, a brief overview is presented on several of these populations.

Gifted Students with Learning Disabilities

The potential frustrations experienced by students with both high potential and learning disabilities may place them at risk for social and emotional problems (Baum & Owen, 2004; Reis, 1995). Identifying traits and characteristics of gifted and talented students with disabilities is complicated by the fact that the abilities of gifted students often mask their disabilities and, in turn, their disabilities may disguise their giftedness. As a result, students who are gifted and also have disabilities are at risk of under identification or exclusion both from programs for students with learning disabilities, and programs for gifted and talented students (Baum & Owen, 2004; Reis, Neu, & McGuire, 1995). This dual exclusion is also true of gifted students with other exceptionalities such as ADHD (Moon, 2002) and Asperger’s syndrome (Neihart, 2000).

Gifted/LD students require unique educational programs and services for both their academic and affective development. According to research by Baum and Owen (2004) and Gerber and Ginsberg (1990), behaviors contributing to success can be cultivated and shaped, and strategies exhibited by successful adults with learning disabilities can be reasonably applied to the education of gifted/LD students. Baum (1990) makes these recommendations for working with gifted students with learning disabilities: encourage compensation strategies, cultivate awareness of strengths and weaknesses, focus on developing the child’s gift, and provide an environment that values individual differences.

Gifted Students with ADHD

Children with ADHD (Attention Deficit Hyper-activity Disorder) and gifted children may exhibit similar behaviors (e.g., inattention, high energy level, and impulsivity), and mounting evidence suggests that many children diagnosed with ADHD are also particularly bright and creative (Cramond, 1995; Leroux & Levitt-Perlman, 2000; Moon, 2002). Likewise, evidence suggests that many gifted children exhibit symptoms similar to those of ADHD when they are unchallenged. Bright students may experience inattention when bored, while also demonstrating a high energy level in areas of intense interest (Reis & McCoach, 2000).

Baum and Owen (2004) found that when schools implement comprehensive programs that identify and develop individual gifts and talents, twice-exceptional students begin to behave socially, emotionally, and academically more like gifted students without disabilities than like nongifted students with learning disabilities. These findings, corroborated by Bender and Wall (1994), indicate that as educators diminish the attention to, and importance of, the disability, and concentrate instead on the gifts, many twice-exceptional students can become creatively productive.

Gifted Students with Behavioral Problems

Gifted students with emotional and behavioral problems are rarely referred for gifted programs, or are terminated from programming due to disruptive actions (Reid & McGuire, 1995). These children often experience periods of underachievement (Reid & McGuire, 1995), are frequently underchallenged in school, and experience high frustration with “dead time” as they wait for their peers to finish their work (Neu, 1993). In a review of the sparse research on this population, Reid and McGuire (1995) found that as a result of their emotional and behavioral disorders, these students may disengage from learning opportunities, resulting in inconsistencies in both academic skills and content knowledge, and high dropout rates.

Underachieving Gifted Learners

Student performance that falls noticeably short of potential, especially for young people with high ability, is bewildering and perhaps the most frustrating of all challenges that teachers and parents face (Reis & McCoach, 2000). According to a 1990 national needs assessment survey conducted by The National Research Center on the Gifted and Talented, educators of gifted students identified the problem of underachievement as their number one concern (Renzulli, Reid, & Gubbins, n.d.). Too often, students who show great academic potential fail to perform at levels commensurate with their abilities. Gifted students who underachieve do so for different reasons (Reis & McCoach, 2000). Some have not learned to work; other students may have poor self-regulation skills, or low self-confidence or self-efficacy. Other low achievers may have either obvious or hidden disabilities, including psychological and/or psychiatric disorders. Some students underachieve or fail in school for obvious reasons: excessive absences from school, poor performance, disruptive behavior, family problems, and poverty (Reis & McCoach, 2000). Underachievement in gifted or high potential students is often the result of their interaction with an inappropriate curriculum and simplistic content. However, underachievement can be reduced, and even eliminated in some students, with the right types of challenge and interest-based programs, as documented by Baum, Renzulli, and Hébert (1995).

Identification of Gifted, Talented and High Potential Students

Identification of gifted, talented, and high potential children continues to be an area of interest and concern to educators and psychologists (Callahan, Hunsaker, Adams, Moore, & Bland, 1995; Ford, 1998; Gagne, 1994; Renzulli & Delcourt, 1994). Questions are often raised about the appropriate age at which children should be identified, what should be included in an assessment, and which tests are most accurate and effective. Although these are important questions, they are not the central issue that relates to the identification of gifted and talented students—namely, for what purpose are we identifying students. In other words, for what programs and services are we identifying students? The methods educators should use to identify an intellectually advanced child in math will be different from those used for a highly creative child, and the programs that are developed to meet the needs of either of these children should be linked to both the definitions and identification procedures used.

How, Why, and When to Identify Gifted and High Potential Students

Differing views exist regarding how, why, and when to identify a child as gifted or talented, as well as the utility of different types and forms of assessment. Most researchers who study identification agree that the primary goal of assessment is to identify a pattern of abilities in and across specific domains (Renzulli & Delcourt, 1994). The rationale for assessment should also be based on how educators and parents can better understand a child's relative strengths and deficits, and how these relate to both educational and social settings. Comprehensive assessment of children's abilities and achievement levels should also focus on determining the level and type of services each student needs. Because there is no perfect test to determine giftedness, we recommend the use of a variety of tests and assessments, rather than the use of IQ testing alone, for a comprehensive examination of children's talents (Renzulli & Delcourt, 1994).

When should we begin the process of identifying gifted and talented students? Generally, testing is believed to be most reliable and most predictive between the ages of six and nine years. Consensus exists among professionals that there is rarely a need to test before the child is ready to enter school, and that testing at younger ages may not provide reliable results (Renzulli, Reis, & Smith, 1981; Robinson, 1987). Most comprehensive assessments conducted by private or school psychologists include some form of developmental history with examples of children's work, as well as a broad battery of assessments. Many tests are used to measure intelligence, aptitude, and achievement, but little consensus exists about which tests are most effective. Because of the flawed options available for testing talented and gifted children, we recommend the use of a variety of tests or test sections for the most comprehensive combination of skills assessments. Most researchers believe that the primary goal of assessment should be to identify a pattern of abilities in and across specific domains (Plucker, Callahan, & Tomchin, 1996; Renzulli & Delcourt, 1994; Renzulli et al., 2002).

Twenty or thirty years ago, identification of gifted and talented students was usually completed primarily through the use of standardized test scores and intelligence tests. During the 1980s, for example, teacher recommendations were most widely used in identification, followed by achievement tests, and then the use of IQ tests (Cox, Daniel, & Boston, 1985). Two decades later, students are most often identified by the use of standardized achievement tests, as they are so readily available. This method of identification has resulted in disproportionately smaller numbers of culturally diverse, learning disabled, or economically disadvantaged students being identified for gifted programs, even though the American population was increasing in diversity, and the number of minority students has increased in schools (Ford, 1998). Accordingly, researchers interested in diverse gifted students are increasingly concerned about how to identify underrepresented populations for gifted program services (Ford, 1998). More equitable methods have subsequently been developed, focusing on the use of multiple criteria (Renzulli & Reis, 1997). Tests remain a part of most identification processes, but teacher nominations and rating scales, as well as students' grades and work, are now included in newer, multiple criteria approaches (Renzulli & Reis, 1997; Renzulli et al., 2002).

Research Based Interventions for Gifted and Talented Students

This section of the chapter includes a comprehensive review of research related to the need for, and efficacy of, different types of interventions for gifted and talented students. We begin this section with an overview of the Schoolwide Enrichment Model, one of the most researched interventions available to challenge academically talented learners (Renzulli, 1977; Renzulli & Reis, 1997; VanTassel-Baska & Brown, 2007). Then, we provide an overview of research findings that establish the groundwork for other programmatic recommendations in this chapter, including the well documented research finding that high potential, above average, and gifted students have not fared well in current school settings in which the focus is on students with deficits, as mandated by current policies related to the No Child Left Behind legislation.

The Schoolwide Enrichment Model

The Schoolwide Enrichment Model (SEM) (Renzulli & Reis, 1985, 1997) was created to encourage and develop both academic talents and creative productivity in young people. The SEM, based on Renzulli's Enrichment Triad, has been implemented in thousands of schools across the country and has continued to expand internationally. Separate studies on the SEM and the Triad Model have demonstrated its effectiveness in schools with widely differing socioeconomic levels and program organization patterns (Burns, 1998; Olenchak, 1988; Olenchak & Renzulli, 1989). The effectiveness of the model has been studied in over 20 years of research and field testing about (a) student creative productivity (Delcourt, 1993; Hébert, 1993; Westberg, 1999); (b) personal and social development (Olenchak, 1991); (c) the use of SEM with culturally diverse or special needs populations (Baum et al., 1995; Olenchak, 1991); (d) student self-efficacy (Schack, Starko, & Burns, 1991; Starko, 1988); (e) the SEM as a curricular framework (Karafelis, 1986; Reis, Gentry, & Park, 1995); (f) learning styles and curriculum compacting (Reis & Purcell, 1993); and (g) longitudinal research on the SEM (Delcourt, 1993; Hébert, 1993; Westberg, 1999). This research on the SEM suggests that the model is effective at serving high ability students, and providing enrichment in a variety of educational settings including schools serving culturally diverse and low socioeconomic populations.

Theoretical Background of the SEM

The SEM is based on Renzulli's three-ring conception of giftedness that defines gifted behaviors rather than gifted individuals, as well as a series of interventions based on the Enrichment Triad Model. The SEM is currently used as the basis for many gifted programs, enrichment programs, and magnet, charter, and theme schools. The original Enrichment Triad Model, with three types of enrichment (Renzulli, 1977), is the core of the SEM. Type I enrichment is designed to expose students to a wide variety of disciplines, topics, occupations, hobbies, persons, places, and events that would not ordinarily be covered in the regular curriculum. Type II enrichment includes materials and methods designed to promote the development of thinking and affective processes that promote original inquiry and creative explorations. Some Type II enrichment is general, consisting of training in areas such as creative thinking and problem solving, learning how to learn skills such as classifying and analyzing data, and advanced reference and communication skills. Type III enrichment occurs when teachers work collaboratively to encourage students to become interested in pursuing a self-selected area, and are willing to commit the time necessary

for advanced content acquisition and process training in which they assume the role of a first-hand inquirer. These three types of enrichment will be discussed in greater detail later in the chapter.

The SEM focuses on the development of both academic and creative-productive giftedness. Creative-productive giftedness describes those aspects of human activity and involvement where a premium is placed on the development of original material and products that are purposefully designed to have an impact on one or more target audiences. Learning situations designed to promote creative-productive giftedness emphasize the use and application of information (content) and thinking skills in an integrated, inductive, and real-problem-oriented manner. In the SEM, academic gifts are developed by transforming the role of the student from that of a learner of lessons, to one in which she or he uses the *modus operandi* of a firsthand inquirer to experience the joys and frustrations of creative productivity. This approach is quite different from other approaches that tend to emphasize deductive learning, advanced content and problem solving, and the acquisition, storage, and retrieval of information. In other words, creative-productive giftedness enables children to work on issues and areas of study that have personal relevance to the student, and can be escalated to appropriately challenging levels of investigative activity.

Identification in the SEM

Translating theory into practice is always challenging. Although our work on a conception of giftedness has dealt with theory development, equal attention has been given to how the theory can guide practical strategies for the identification of all students who can benefit from special services. This constitutes one of the greatest challenges in the SEM, because a more flexible approach to identification oftentimes is at odds with traditional state or local regulations that require precision, names on lists signifying who is gifted, and resource allocations that make sharp distinctions between the work of special program personnel, and other teachers who may be able to contribute to a school's total talent development mission. These practical realities have resulted in our identification plan that, while still maintaining a degree of flexibility, is a compromise between a totally performance-based system, and a system that targets certain students.

The goal of identification within the SEM is to form a talent pool of students who are targeted because of strengths in particular areas that will serve as a primary (but not total) rationale for the services that the special program will provide. Before listing the six steps involved in this identification system, three important considerations will be discussed. First, talent pool size will vary in any given school, depending upon the general nature of the total student body. In schools with unusually large numbers of high achieving students, it is conceivable that talent pools will be larger than in lower scoring schools, But even in schools where achievement levels are below national norms, there still exists an upper level group of students who need services above and beyond those provided for the majority of the school population. Some of our most successful programs have been in urban schools that serve disadvantaged and bilingual youth. Even though these schools were below national norms, talent pools of approximately 15% of students needing supplementary services were still identified. Talent pool size is also a function of the availability of resources (both human and material), and

the extent to which the general faculty is willing (a) to make modifications in the regular curriculum for above average ability students; (b) to participate in various kinds of enrichment and mentoring activities; and (c) to work cooperatively with any and all personnel who may have special program assignments. It is very important to determine beforehand the number of students who can be served in ways that make a difference when program accountability is considered, such as curriculum compacting and the use of advanced content. Since teacher nomination plays an important role in this identification system, a second consideration is the extent of orientation and training that teachers have had, about both the program and procedures for nominating students. A third consideration is, of course, the type of program for which students are being identified. The identification system is based on models that combine both enrichment and acceleration, whether or not they are carried out in self-contained programs, inclusion programs, pull-out programs, or any other organizational arrangement. Regardless of the type of organizational model used, it is also recommended that a strong component of curriculum compacting (Reis, Burns, & Renzulli, 1992) be a part of the services offered to high achieving talent pool students.

Once a target number or percent of the school population is established, that number should be divided in half. For example, if the target talent pool is 15% talent pool, approximately half of the students will be selected using test scores, thus guaranteeing that the process will not discriminate against traditionally high scoring students. Step Two uses a research-based teacher nomination scale (Renzulli et al., 2002) for students not included in Step One. Again, the above-mentioned training helps to improve the reliability of ratings. With the exception of teachers who are habitually under- or over-nominators, these ratings are treated on a par value with test scores. Our experience has shown that the vast majority of talent pool nominees result from the first two steps.

Step Three enables the use of other criteria (e.g., parent, peer, or self-nomination, previous product assessment) that a school may or may not want to consider—but in this case, a selection committee reviews the information in a case study fashion. Step Four enables previous year teachers to recommend students who were not nominated in the first three steps. This “safety valve” guards against bias or incompatibility on the part of the nominator in Step Two, and it allows for consideration of student potential that may be presently unrecognized because of personal or family issues, or a turn-off to school. Step Five provides parents with information about why their son or daughter was nominated for the talent pool, the goals and nature of the program as it relates to their child’s strength areas, and how a program based on the Three-Ring Conception of Giftedness differs from other types of programs. Step Six is a second safety valve, in which teacher nomination enables the consideration of targeted services for a young person who may show a remarkable display of creativity, task commitment, or a previously unrecognized need for highly challenging opportunities.

Overview of the SEM

The SEM (1997) was designed to challenge and meet the needs of high potential, high ability and gifted students, and at the same time, provide challenging learning experiences for all students. In the SEM, using the identification steps discussed previously, a talent pool of 10%–20% of above average ability/high potential students is identified and eligible for three services:

the Total Talent Portfolio, Curriculum Modification and Differentiation, and Enrichment (See Figure 2). These three services are delivered across the regular curriculum, a continuum of services, and a series of enrichment clusters.

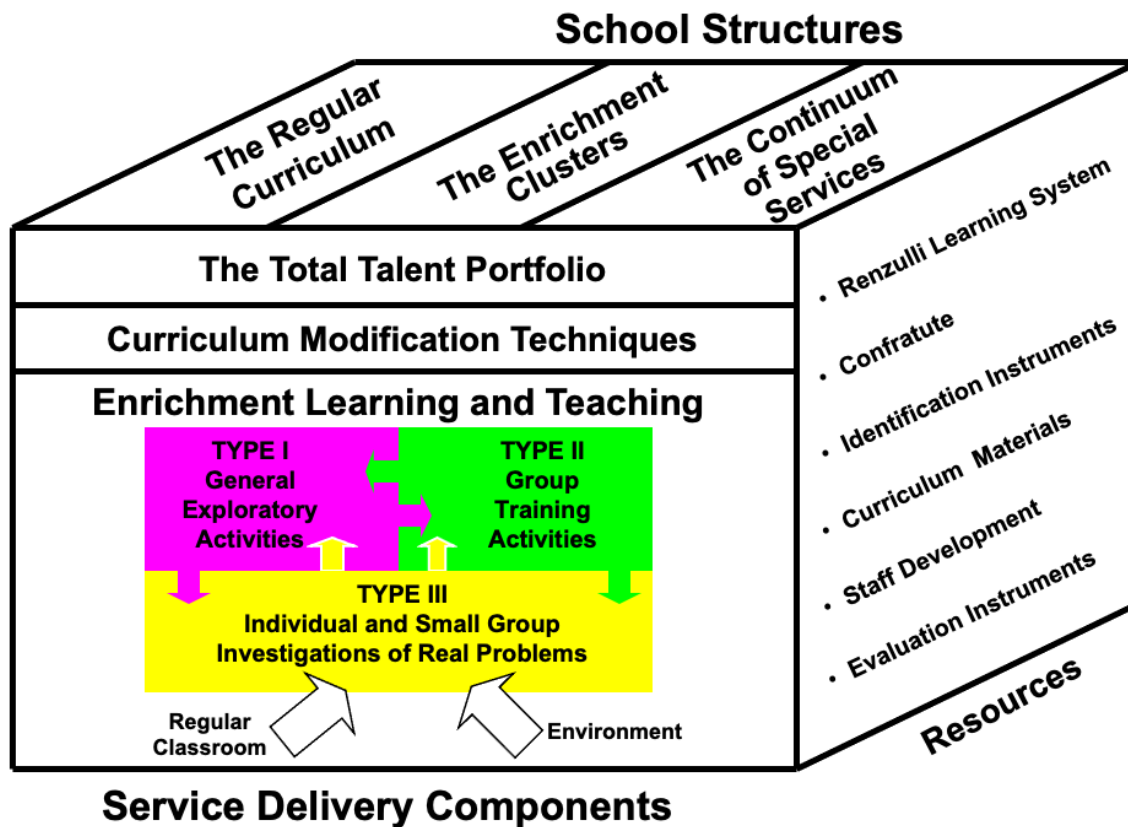


Figure 2. The Schoolwide Enrichment Model (SEM)

In the SEM, teachers encourage students to better understand four dimensions of their own learning: their abilities, interests, learning styles, and preferred modes of expression. This information, focusing on their strengths rather than deficits, is compiled into a “Total Talent Portfolio” which can be subsequently used to make decisions about talent development opportunities in regular classes, enrichment clusters, and/or in the continuum of special services. The ultimate goal of learning that is guided by these principles and the SEM is to replace dependent and passive learning with independence and engaged learning.

Curriculum differentiation using compacting and other forms of curriculum modification are also provided to all eligible students for whom the regular curriculum must be adjusted. Curriculum compacting is the elimination or streamlining of curriculum to enable above average students to avoid repetition of previously mastered work. The compacting process guarantees mastery, while simultaneously finding time for more appropriately challenging activities. A form, entitled the Compactor, is used to document which content areas have been compacted and what alternative work has been substituted (See Figure 3).

INDIVIDUAL EDUCATIONAL PROGRAMMING GUIDE

The Compactor

Prepared by: Joseph S. Renzulli
Linda M. Smith

NAME _____	AGE _____	TEACHER(S) _____	Individual Conference Dates And Persons Participating in Planning Of IEP
SCHOOL _____	GRADE _____	PARENT(S) _____	_____
<u>CURRICULUM AREAS TO BE CONSIDERED FOR COMPACTING</u> Provide a brief description of basic material to be covered during this marking period and the assessment information or evidence that suggests the need for compacting.	<u>PROCEDURES FOR COMPACTING BASIC MATERIAL</u> Describe activities that will be used to guarantee proficiency in basic curricular areas.	<u>ACCELERATION AND/OR ENRICHMENT ACTIVITIES</u> Describe activities that will be used to provide advanced level learning experiences in each area of the regular curriculum.	

Check here if additional information is recorded on the reverse side.

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Figure 3. The Compactor

Third, a series of enrichment opportunities organized around the Enrichment Triad Model offers three types of enrichment experiences through various forms of delivery, including the regular curricular and enrichment clusters. The Triad Model (Renzulli, 1977)—the curriculum and instructional basis of the Schoolwide Enrichment Model—was originally designed as a gifted program model to (a) encourage creative productivity in young people by exposing them to various topics, areas of interest, and fields of study and (b) further train them to *apply* advanced content, process-training skills, and methodology training to self-selected areas of interest using three types of enrichment. Types I, II, and III enrichment are offered to all students; however, Type III enrichment is usually more appropriate for students with higher levels of ability, interest, and task commitment.

Type I enrichment is designed to expose students to a wide variety of disciplines, topics, occupations, hobbies, persons, places, and events that would not ordinarily be covered in the regular curriculum. In schools using this approach, an enrichment team of parents, teachers, and students often organizes and plans Type I experiences by contacting speakers, arranging minicourses, conducting overviews of enrichment clusters, demonstrations, performances, or by ordering and distributing films, slides, videotapes, or other print and nonprint media.

Type II enrichment includes materials and methods designed to promote the development of thinking and feeling processes. Some Type II enrichment is general, consisting of training in

areas such as creative thinking and problem solving, learning how to learn skills such as classifying and analyzing data, and advanced reference and communication skills. Type II training is usually carried out both in classrooms and in enrichment programs, and includes the development of (1) creative thinking and problem solving, critical thinking, and affective processes; (2) a wide variety of specific learning-how-to-learn skills; (3) skills in the appropriate use of advanced level reference materials; and (4) written, oral, and visual communication skills. Other Type II enrichment is specific, as it cannot be planned in advance and usually involves advanced instruction in an interest area selected by the student. For example, students who become interested in botany after a Type I on this topic would pursue advanced training in this area by reading advanced content in botany, compiling, planning and carrying out plant experiments, and, eventually, using more advanced methods training for those who choose to pursue a Type III in this area.

Type III enrichment involves students who become interested in pursuing a self-selected area, and are willing to commit the time necessary for advanced content acquisition and process training when they assume the role of a firsthand inquirer. The goals of Type III enrichment are providing opportunities for applying interests, knowledge, creative ideas, and task commitment to a self-selected problem or area of study; acquiring advanced level understanding of the knowledge (content) and methodology (process) that are used within particular disciplines, artistic areas of expression, and interdisciplinary studies; developing authentic products that are primarily directed toward bringing about a desired impact upon a specified audience; developing self-directed learning skills in the areas of planning, organization, resource utilization, time management, decision making, and self-evaluation; and the development of task commitment, self-confidence, and feelings of creative accomplishment. Type III products can be completed by individuals or small groups of students, and are always based on students interests.

The three service delivery components of the SEM (Total Talent Portfolio, Curriculum Compacting, and Enrichment Teaching and Learning) are applied to three school structures: the regular curriculum, enrichment clusters, and a continuum of services developed as a part of the SEM.

The Regular Curriculum

The regular curriculum includes the predetermined goals, learning outcomes, and delivery systems of the school. The regular curriculum might be traditional, innovative, or in the process of transition, but its predominant feature is that policymakers, school councils, or textbook adoption committees have determined that the regular curriculum should be the “centerpiece” of student learning. Application of the SEM influences the regular curriculum in three ways: through processes such as curriculum compacting and differentiation and modification procedures; the replacement of easier content with in-depth learning experiences; and the types of enrichment recommended in the Enrichment Triad Model (Renzulli, 1977).

The Enrichment Clusters

Enrichment clusters, a second component of the Schoolwide Enrichment Model, are nongraded groups of students who share common interests and are grouped together during specially

designated time blocks, to work with an adult who shares their interests and has some degree of advanced knowledge and expertise in the area. Enrichment clusters usually meet for a block of time each week during the semester, and all students in the school participate, therefore enabling some enrichment services to be given to all students in the school. All students complete an interest inventory developed to assess their interests, and an enrichment team of parents and teachers tally all of the major families of interests. Adults from the faculty, staff, parents, and community are recruited to facilitate enrichment clusters based on these interests, which might include creative writing, drawing, sculpting, archeology, and other areas. Training is provided to the facilitators who agree to offer the clusters, and a brochure is developed and sent to all parents and students with descriptions of enrichment clusters. Students select their top three choices for the clusters, and scheduling is completed to place all children into their first, or in some cases, second choice. Like extracurricular activities and programs such as 4-H and Junior Achievement, the main rationale for participation in one or more clusters is that *students and teachers want to be there*. All teachers (including music, art, physical education, etc.) are involved in facilitating the clusters, and their involvement in any particular cluster is based on the same type of interest assessment that is used for students in selecting clusters of choice.

The Continuum of Special Services

A broad range of special services is the third school structure targeted by the model (See Figure 4). Although the enrichment clusters and the SEM-based modifications of the regular curriculum provide a broad range of services to meet individual needs, a program for total talent development still requires supplementary services that challenge our most academically talented young people, who are capable of working at the highest levels of their special interest and ability areas. These services, which cannot ordinarily be provided in enrichment clusters or the regular curriculum, typically include individual or small group counseling, various types of acceleration, direct assistance in facilitating advanced level work, arranging for mentorships with faculty members or community persons, and making other types of connections between students, their families, and out-of-school persons, resources, and agencies.

Direct assistance also involves setting up and promoting student, faculty, and parental involvement in special programs such as creative problem solving competitions (such as Future Problem Solving, Odyssey of the Mind), state and national essay competitions, and mathematics, art, and history contests. Another type of direct assistance consists of arranging out-of-school involvement for individual students in summer programs, on campus courses, special schools, theatrical groups, scientific expeditions, and apprenticeships at places where advanced level learning opportunities are available. Provision of these services is one of the responsibilities of the enrichment specialist, or an enrichment team of teachers and parents who work together to provide options for advanced learning.

New Directions: Using Renzulli Learning to Implement the SEM

Renzulli Learning (RL) is an interactive online program that assists with the implementation of SEM by matching student interests, expression styles, and learning styles with a vast array of enrichment activities and resources designed to engage and challenge all students. RL helps students independently explore, discover, learn, and create using the SEM and the most current technology resources, independently and in a safe environment.

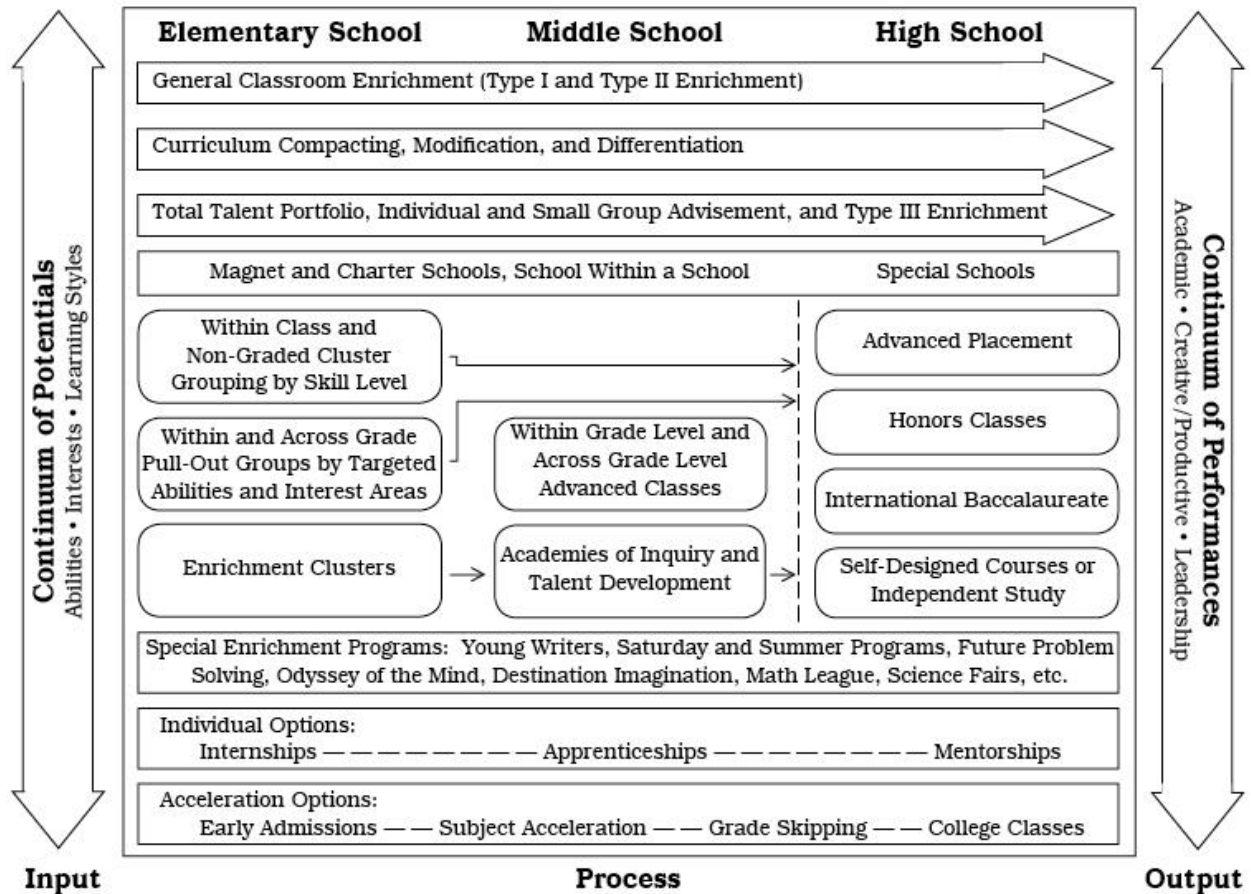


Figure 4. The Continuum of Services

RL has easy-to-use online tools that help with the implementation of SEM, including an interactive profiler assessment tool to identify students' talents, strengths, interests, preferred learning and expression styles. Following the completion of their profile, students are matched to resources from the Renzulli Enrichment Database, containing over 36,000 carefully screened, grade-level appropriate, child-safe enrichment opportunities, which are regularly monitored, updated, enhanced, and expanded. They also have access to the Wizard Project Maker, an online project tool that helps students to create their own high interest projects and store them in their own Talent Portfolio. Over 150 Super Starter Projects have been added to the Project Maker, enabling students to have the scaffolding to begin the process of selecting and independently completing projects in their areas of interest.

Collectively, the components of RL correlate with the SEM to provide both students and teachers with unique educational experiences, which are directly suited to their unique learning profiles, while simultaneously giving parents insights about their child's enrichment needs. RL also helps all teachers better understand and know their students and meet their diverse needs. Perhaps the most significant aspect of the RL is its emphasis on students' strengths. Many adjunct educational programs focus on finding and correcting weaknesses and liabilities. RL celebrates and builds upon students' strengths, abilities, and interests, in the tradition of SEM. This web-based online program matches students' interests, learning styles, expression styles,

abilities, and grade level to thousands of opportunities designed to provide enriched and challenging learning.

Few instructional practices or curriculum are currently being implemented to challenge gifted and talented students in American classrooms. The SEM is one instructional and programmatic service that can encourage the talents and develop the gifts of high potential students. The next part of the chapter includes a research-based summary of the reasons that gifted programs should be implemented, as well as a compilation of strategies, in addition to SEM, that have also been demonstrated to develop high potentials in children.

Demonstrated Lack of Challenge for Gifted Students in Regular Classrooms

Why are programs for talented and gifted students needed in schools? According to several well designed studies, the needs of gifted and high ability students are generally not addressed or met in American classrooms, where the focus is most often on struggling learners and where most classroom teachers have not had the training necessary to meet the needs of gifted students (Archambault et al., 1993; Fordham, 2008; Moon, Tomlinson, & Callahan, 1995; Reis et al., 2004; Reis & Purcell, 1993; Westberg, Archambault, Dobyns, & Salvin, 1993). This is the major reason that programs and services such as the SEM and acceleration remain so important for gifted and talented students. Archambault and colleagues (1993) found that 61% of approximately 7300 randomly selected third and fourth grade teachers in public and private schools in the United States reported that they had never experienced any training in teaching gifted students. In their classroom practices studies, a broad and diverse sample of classroom teachers admitted that they made, on a very irregular basis, only minor modifications to the regular curriculum to meet the needs of gifted students. This result was consistent for all types of schools sampled, and for classrooms in various parts of the country and for various types of communities.

Westberg et al. (1993), in a follow-up to the Classroom Practices Study, conducted systematic observations in 46 third or fourth grade classrooms with two students: one high ability student, and one average ability student. They found little differentiation in the instructional and curricular practices, including grouping arrangements and verbal interactions, for gifted students in the regular classroom. In all content areas over 92 observation days, gifted students rarely received instruction in homogeneous groups (only 21% of the time), and targeted gifted students experienced no instructional or curricular differentiation in 84% of the instructional activities in which they participated. A recently released Fordham Institute report found that low-achieving students made gains under NCLB, advanced learners did not. These students may be failing to make progress because teachers believe that they need to spend the majority of their time with struggling students, even though they know that others in the classroom need attention as well (Fordham, 2008). In a study by Reis and colleagues (2004), talented readers in urban and suburban schools were found to have received very little reading instruction at all, and little purposeful or meaningful differentiated reading instruction was provided for talented readers in any of the classrooms. Above-grade-level books were rarely available for these students in their classrooms, and they were not often encouraged to select more challenging books from the school library. Talented readers seldom encountered challenging reading material during regular classroom instruction. Even less advanced content and instruction was made available for urban

students than for suburban. Attention in almost all classrooms was directed primarily at students who read well below grade level, while talented readers received little reading instruction and differentiation.

Reis, Westberg, Kulikowich, and Purcell (1998), in an analysis of content elimination and strategies used by elementary classroom teachers in the curriculum compacting process, found that the use of curriculum compacting could be used to modify the curriculum and eliminate previously mastered work for high ability/gifted students. Classroom teachers could eliminate between 40%–50% of the previously mastered regular curriculum for high ability students, and when they eliminated that content, no differences were found between students whose work was compacted and students who did all the work in reading, math computation, social studies, and spelling. Almost all classroom teachers learned to use compacting, but they needed coaching and support to substitute appropriately challenging options.

Moon et al. (1995) studied gifted students in middle schools, finding similar patterns of results: both teachers and principals readily admitted that academically diverse populations receive very little, if any, targeted attention in their schools. Teachers reported the use of little differentiation for gifted middle school students. This study demonstrated that both principals and teachers held strong beliefs that may deny challenge to advanced middle school students. The overwhelming majority believed that these students' needs are more social than academic. Half of all middle school principals and teachers surveyed actually stated that they believed that middle school students were in a plateau learning period, where little new learning takes place.

In summary, during the last decade or two, several research studies have found little differentiation of curriculum and instruction for gifted and talented students in regular classrooms (Archambault et al., 1993; Fordham Institute, 2008; Moon et al., 1995; Reis et al., 2004; Reis & Purcell, 1993; Westberg et al., 1993). Although this differentiation can and will be implemented with strong support and professional development, it occurs much less often than it should, due to a lack of training, resources, and materials to assist teachers.

Demonstrated Underachievement in Academically Talented Students

Identified populations of gifted students underachieve or fail in school. For example, Hébert and Reis (1999) and Reis and Diaz (1999) studied academically talented urban students who either achieved or underachieved in high school, finding that half of the 35 students who participated in this longitudinal study underachieved in school. Academically talented students who achieved in school acknowledged the importance of being grouped together in honors and advanced classes with other academically talented and motivated students. The findings in these studies strongly suggested that underachievement began in elementary school, where these high potential students were not provided with appropriate levels of challenge, and never learned to work.

Gifted students are also among the 8000 students who drop out each day in our country. Renzulli and Park (2000) found that approximately 5% of a large, national sample of gifted students dropped out of high school. These students leave school for many reasons, including poor grades, failure to engage, need for employment, pregnancy, and/or other related reasons.

Many gifted students who dropped out of school participated in fewer extracurricular activities. Many of these students were from low SES families and culturally diverse groups, and had parents with low levels of education.

Current research also suggests that high ability and gifted students from high poverty backgrounds often face the greatest challenges in continuing to make academic progress in school. In a recent report released by the Jack Kent Cooke Foundation, *Achievement Trap: How America is Failing 3.4 Million High-Achieving Students from Lower-Income Families*, found that millions of lower-income, high achieving students fail to make progress in school. The report highlights troubling statistics showing that only 28% of students in the top quarter of their first grade class are from lower income families, while 72% come from higher income families. This decrease worsens over time; as during the period between first to fifth grade, nearly half of the lower income students in the top 25% of their class in reading fell out of this high quartile. The trend continues in high school, where another quarter of the lower income students who ranked in the top 25% of their class in eighth grade math fell out of this top ranking by twelfth grade. It is critical to note that upper income students maintain their places in the top quartile of achievement at significantly higher rates than lower income students, again suggesting that poverty has a negative developmental outcome on the development of gifts and talents in this population.

Other Research Based Services to Challenge Gifted and Talented Students

What instructional and programmatic services can benefit gifted and high potential students whose needs are so seldom addressed? What services and programs can be implemented, in addition to the SEM, to encourage the talents and develop the gifts of high potential students? The following research based strategies have been demonstrated to contribute to the development of students' gifts and talents.

Instructional Grouping Practices

A volume of research has demonstrated that instructional grouping practices that enable high potential and gifted students to be grouped together, result in higher achievement for these students (Gentry & Owen, 1999; Kulik, 1992; Rogers, 1991). Several different methods can be used to implement instructional grouping in and across classrooms. Cluster grouping across classrooms is the purposeful reduction in the range of instructional levels by clustering groups of learners in similar levels of achievement together in one classroom. In a study of cluster grouping, Gentry and Owen (1999) found that elementary aged students of all achievement levels (high, medium, and low) benefited from cluster grouping, and other forms of instructional grouping accompanied by differentiated instruction and content. Students in cluster group classrooms scored significantly higher than students who were not grouped, and increasing numbers of students were identified as high achieving during the three years that cluster grouping was used in the school.

Kulik's (1992) research synthesis on instructional and ability grouping showed that achievement is increased when gifted and talented students are grouped together for enriched or accelerated learning. Instructional grouping without curricular acceleration or enrichment

produced little or no differences in student achievement in Kulik's research. Bright, average, and struggling students all benefitted from being grouped with others in their ability/instructional groups when the curriculum was adjusted to the aptitude levels of the group. Kulik found that when gifted students were grouped together, and received advanced enrichment or acceleration, they outperformed control group students, who were not grouped and did not receive enrichment or acceleration, by five months to a full year on achievement tests.

Rogers also conducted a meta-analysis (1991) on the benefits of using grouping to meet the needs of academically talented and gifted students, and found that grouping gifted and talented students together for instruction improved their academic achievement. Full-time ability/instructional grouping produced substantial academic gains in these students. Pull-out enrichment grouping options produced substantial academic gains in general achievement, critical thinking, and creativity. Within-class grouping and regrouping for specific instruction options also produced substantial academic gains, when the instruction was differentiated. Cross-grade grouping also resulted in substantial academic gains.

Tieso (2002) also studied instructional grouping in math with 645 students elementary and middle school students, and found significant differences on math achievement for treatment group students (who were grouped for an enriched math lesson and exposed to an enhanced unit) when compared to the comparison groups. Results indicated significant differences favoring the group that received a modified and differentiated curriculum in a grouped class.

Instructional grouping with differentiated content has been repeatedly found to benefit this population, resulting in increased achievement for gifted and talented students, and in some cases, also for students who are achieving at average and below average levels (Gentry & Owen, 1999; Kulik, 1992; Rogers, 1991; Tieso, 2002). Grouping students, however, without changing the curriculum after the grouping has occurred, results in few to no academic gains (Kulik, 1992; Rogers, 1991).

Acceleration

Acceleration of various types enables academically talented and gifted students to move more rapidly than usual through the regular curriculum, and results in exposing students to curriculum at a younger age than usual (Colangelo, Assouline, & Gross, 2004). Various forms of acceleration are used in many schools—grade skipping (the most common form), as well as early entrance to kindergarten or first grade; content-level acceleration, which enables students who are advanced in reading to work at an advanced level that is commensurate with their reading comprehension level; and curriculum compacting. Research over the last few decades has demonstrated that acceleration practices have positive effects on academic achievement (Colangelo et al., 2004; Kulik, 1992), and limited or nonexistent negative effects on psychosocial adjustment (Brody & Benbow, 1987; Kulik, 1992).

A report funded by The Templeton Foundation entitled *A Nation Deceived* (Colangelo et al., 2004) identified many forms of acceleration that enabled students to complete traditional school curriculum at much faster rates. The report summarized research finding that students who were accelerated tended to be more ambitious and earn graduate degrees at higher rates than

other students. Interviewed years later, an overwhelming majority of accelerated students say that acceleration was an excellent experience for them. The report also summarized research documenting the fact that accelerated students believed they were both academically challenged and socially accepted, and did not fall prey to boredom, as did so many highly capable students who are forced to follow the curriculum for their age peers. Acceleration of high potential and gifted students has been studied for decades, and research about this standard practice has been uniformly positive (Colangelo et al., 2004; Kulik, 1992). In summary, a strong research base demonstrates that the use of acceleration results in higher achievement for gifted and talented learners (Colangelo et al., 2004; Kulik, 1992; Rogers, 1991).

Enrichment and Curricular Enhancement

Enrichment experiences are usually given to advanced students to spark their interests, engage them in more challenging content, and extend and enrich their school experiences so that they are more challenged and interested (Renzulli & Reis, 1997). Enrichment can be constructed around the interests and talents of children, and can also be based on what teachers and other professionals determine to be appropriate content and curriculum, such as extensions of the regular curriculum, or more advanced curriculum in areas of talent and strengths. Enrichment should also be provided to all students, but the depth, pace, and level of enrichment for academically talented students should be differentiated to meet their individual needs.

Enrichment has been shown to have strong, positive effects on the achievement of academically talented students. Curricular enhancement and enrichment occur in many different ways. Classroom teachers can differentiate curriculum and instruction in their regular classroom situations, and can substitute eliminated work by extending gifted education strategies and pedagogy to other content areas (Gavin et al., 2007; Reis et al., 2007; Reis, Westberg et al., 1998; Tieso, 2002).

Enrichment includes work given to students that extends beyond the regular classroom, and may include predetermined, academically challenging units of enriched instruction in areas that extend the regular curriculum. Academically talented students may be able to participate in an enriched unit that enables them to delve more deeply into some area of the prescribed curriculum with more depth and complexity (Kaplan, 1999). Depth and complexity can be applied to the regular curriculum in many ways. While other students learn about the pilgrims landing at Plymouth, MA, identified gifted students may, for example, use primary sources from the Plimoth Plantation online archives to examine and study of artifacts of the daily life of seventeenth-century residents, comparing the life experiences of the Indians to those of the pilgrims.

Other forms of enrichment enable teachers and/or specialists with a background in enrichment and gifted education pedagogy to work collaboratively with classroom teachers to co-teach and/or design special activities. They may also work with small groups of students on extensions of the regular curriculum, or pursue independent or small group projects that either extend the regular curriculum or give opportunities for independent study or self-selected investigations of problems that students identify. The focus of many enrichment programs is on creative and critical thinking, problem solving, and opportunities for leadership, talent

development in both intellectual/academic areas and the arts, and the creation of products and investigation of problems of personal interest to students (Renzulli & Reis, 1997).

Curriculum enhancement in programs or classes for gifted and talented students is usually organized around more complex ideas, problems, and themes that integrate knowledge across content areas (Renzulli, 1977, 1988; VanTassel-Baska, Bass, Ries, Poland, & Avery, 1998), Curriculum for this population should also enable students to develop and apply critical and creative thinking skills that may lead to the generation of new knowledge. Curriculum for the gifted/talented also enables students to understand that knowledge changes constantly, and that individuals are responsible for their own learning and understanding. Renzulli (1988) also suggested that curriculum for the gifted involves the opportunity for independent learning, the pursuit of real problems, and the chance to use the methods of practicing professionals including authentic inquiry.

Research on the use of enrichment and curriculum enhancement has also shown that these forms of gifted programming result in higher achievement for gifted and talented learners, as well as other students (Field, 2009; Gavin et al., 2007; Gentry & Owen, 1999; Gubbins et al., 2008; Renzulli & Reis, 1994; Reis et al., 2007). Some enrichment pedagogy and strategies (i.e., choice, interest, independent study) can benefit struggling and special needs students when implemented in a variety of settings (Baum, 1988; Reis & Renzulli, 2003; Reis et al., 2007). Vaughn, Feldhusen, and Asher (1991), in a meta-analysis of research on pull-out programs in gifted education, evaluated the effectiveness of these programs, using experimental studies that investigated self-concept, achievement, critical thinking, and creativity. The results indicated that enrichment models in gifted education have significant positive effects on achievement, critical thinking, and creativity.

Differentiation of the Regular Curriculum for Gifted and Talented Students

A strong body of research also suggests that although the process is challenging, differentiated curriculum and instruction in regular classroom situations resulted in higher levels of challenge and engagement for both gifted and talented students, as well as other students who may not have been identified as talented, but who have potential in one or more content areas (Colangelo et al., 2004; Field, in press; Reis, Gentry, & Maxfield, 1998; Reis et al., 2007; Reis, Westberg et al., 1998).

Field (2009) conducted an experimental study using Renzulli Learning to help teachers differentiate instruction. She investigated reading fluency and comprehension, as well as social studies achievement, in 383 elementary and middle school students, finding that after 16 weeks, students who participated in differentiated programs using Renzulli Learning for 2–3 hours each week demonstrated significantly higher growth in reading comprehension than control group students who did not participate in the program. Students who participated in Renzulli Learning demonstrated significantly higher growth in oral reading fluency and in social studies achievement than those students who did not participate.

Gifted education programs and strategies have also been found to be effective at serving gifted and high ability students in a variety of educational settings and in schools serving diverse

ethnic and socioeconomic populations, and in reversing underachievement in these students (Baum, 1988; Baum, Hébert, & Renzulli, 1999; Colangelo et al., 2004; Gavin et al., 2007; Hébert, & Reis 1999; Reis et al., 2007).

Content Area Enrichment and Curriculum Enhancement

Gavin et al. (2007) investigated methods of providing enriched math curriculum on math achievement in elementary students using Project M³: Mentoring Mathematical Minds. Enriched curriculum units were developed for mathematically talented students. This enriched, challenging math curriculum resulted in significant gains in achievement in math concepts, computation, and problem solving, each year over a 3-year period, for talented math students in grades 3, 4, and 5. Students using the curriculum outperformed a comparison group of students of like ability from the same schools. Significant gains were found on challenging open-ended problems, adapted from international and national assessments, in favor of students using the enriched curriculum over the comparison group. Students receiving the advanced math achieved significant gains in all mathematical concepts across grade levels.

Little, Feng, VanTassel-Baska, Rogers, and Avery (2007) studied the use of an enriched social studies curriculum with 1200 students, using quasi-experimental methods to examine curriculum designed to respond to the needs of high ability students in elementary and middle school social studies. Results demonstrate significant differences between treatment and comparison groups in the area of content learning, favoring the treatment group; but no significant differences were found for the small subsample of gifted students. Continuing with the use of quasi-experimental designs, VanTassel-Baska et al. (1998) studied the effectiveness of an enriched science curriculum for high ability students, and found small but significant gains for students using a unit on the dimension of integrated science process skills, when compared to equally able students not using the units. In another quasi-experimental study, VanTassel-Baska, Zuo, Avery, and Little (2002) investigated the use of the William and Mary Language Arts and Science Curriculum, with gifted students in grades 3 to 5 in language arts, critical reading, persuasive writing, and scientific research design skills, through the use of the curriculum across individual academic years finding significant increases for students using the program.

Reis and colleagues (2007, 2008) investigated the use of the Schoolwide Enrichment Model in Reading (SEM-R) in experimental designs to compare performances of students who used the SEM-R as opposed to control group students who participated in basal reading programs. The SEM-R is an enriched and accelerated program that targets talented readers, but is usually implemented in regular classrooms. Students who participated in the SEM-R had significantly higher scores in reading fluency, comprehension, and attitudes toward reading than students in the control group, who did not participate (Reis & Fogarty, 2006; Reis et al., 2007, 2008). Students in the SEM-R treatment group scored statistically significantly higher than those in the control group in reading fluency and comprehension. Results demonstrated that talented readers, as well as average and below average readers, benefited from the SEM-R intervention (Reis et al., 2005; Reis et al., 2007; Reis, Eckert, et al., 2008).

Social and Emotional Counseling and Support

A recent research synthesis was conducted by scholars in the field to address the social and emotional needs of gifted and high ability students, suggesting that children so identified are typically at least as well adjusted as any other group of children (Neihart, Reis, Robinson, & Moon, 2001). Nevertheless, these students face a number of issues that, while not unique to them, can constitute sources of risk to their social/emotional development. Some of these issues emerge because of the mismatch with educational environments not responsive to the pace and level of gifted students' learning and thinking. Some seem to arise from the creativity, energy, intensity, and advanced abilities of these students, as well as the developmental internal asynchronies they experience. Still other issues emanate from the difficulty many gifted students experience in finding compatible friends, and the pressures they feel to conform.

The aspects of gifted children's life experience that result from their differences from other children, and the fact that most of them demonstrate greater maturity in some domains than others, may put them at risk for specific kinds of social and emotional difficulties if their needs are not addressed through counseling and support from teachers, parents, psychologists and counselors. These need include ways to adjust to issues deriving from students' advancement compared with age peers problems deriving from internal asynchronies in development; common areas of psychological vulnerability, such as underachievement; and being labeled as a member of a group of gifted children and youth with special needs, such as those who underachieve (Neihart, Reis, Robinson, & Moon 2001). Some counseling and support strategies to support these students would be necessary for them to realize their potential.

Longitudinal Research on Programs

Several different longitudinal studies have been conducted on gifted students. Subotnik and Arnold (1994) published a volume summarizing some of this work, and other researchers have continued to do work in this area with compelling findings. Hébert (1993), in studying the long-term impact of elementary school experiences in creative productivity, found that participation in gifted programs had a positive effect on the subsequent interests of students and also positively affected their post-secondary plans. In the same study, early advanced project work served as important training for later productivity, and nonintellectual characteristics with students remained consistent over time.

In a similar longitudinal study, Westberg (1999) studied participants in a program based on Renzulli's (1977) Enrichment Triad Model, and found that students maintained interests and were still involved in both interests and creative productive work after they finished college and graduate school. Delcourt (1993) also studied participants in a longitudinal study investigating creative productivity among secondary school students, finding several benefits of gifted programs. She learned that students maintained interests over time, and were still involved in creative productive work a decade after they left their gifted programs. Students who had participated in gifted programs maintained the interests they developed in these programs. These interests, in turn, influenced their career aspirations in college. Students' gifts and talents could be predicted by their elementary school creative/productive behaviors. Taylor (1992) studied the effects of the use of the Enrichment Triad Model on the career development of 60

vocational/technical school students, finding that students' involvement in gifted programs in high school enabled them to explore potential career interests, allowed them to see themselves in the role of practicing professionals, and helped them visualize a different sense of self. Students had increased post-secondary education plans that had expanded from obtaining an associate's degree to graduating from a 4-year college program. Moon, Feldhusen, and Dillon (1994) conducted a retrospective study investigating the effects on students and their families of an elementary pull-out gifted program, based on the Purdue Three-Stage Model, and most families indicated the program had a long-term positive impact on the cognitive, affective, and social development of participating students.

Compelling research has also documented the benefits of acceleration. Lubinski, Webb, Morelock, and Benbow (2001) conducted follow-up studies with 320 gifted students identified as highly gifted adolescents. These students pursued doctoral degrees at over 50X the base rate expectations. In a similar study, Lubinski, Benbow, Webb, and Bleske-Rechek (2006) investigated talent-search participants who scored in the top .01% on cognitive ability measures, and were identified before age 13 and tracked over 20 years. Their creative, occupational, and life accomplishments were compared with those of graduate students (299 males, 287 females) enrolled in top-ranked U.S. mathematics, engineering, and physical science programs in 1992 and tracked over 10 years. By their mid-30s, the two groups achieved comparable and exceptional success (e.g., securing top tenure-track positions) and reported high and commensurate career and life satisfaction. Park, Lubinski, and Benbow (2007) studied a sample of 2,409 intellectually talented adolescents (top 1%) who were assessed on the SAT by age 13 and tracked longitudinally for more than 25 years. The creative accomplishments of this group, with particular emphasis on literary achievement and scientific/technical innovation, were examined. The results showed that the distinct ability patterns identified by age 13 suggested subsequent similar and complimentary creative expression by middle age.

Developing a Continuum of Services to Challenge All Gifted and Talented Students

We recommend, as part of the SEM approach described earlier (1997), the development of a continuum of services to challenge the diverse learning and affective needs of gifted and talented students. These services should be targeted for high potential and gifted and talented students across all grade levels. A broad range of both cognitive and affective services should be implemented to ensure that children have access to areas such as curriculum and instructional differentiation to meet their rapid, advanced learning needs. These include both advanced content, to enable all students to make continuous progress in all content areas, as well as the availability of opportunities for individualized research for students who are highly creative and want the chance to pursue advanced interests (Renzulli, 1977; Renzulli & Reis, 1997). For students with gifts and talents who are underachieving or have learning disabilities, counseling and other services are recommended to address their special affective needs (Baum & Owen, 2004; Reis & McCoach, 2000).

Two considerations exist when a districtwide continuum of services is developed (Renzulli & Reis, 1997). The first is organizational, relating to where and when students will be provided with services to meet their advanced learning needs. Gifted and talented students can be grouped by instructional level in both elementary and middle schools. They can be cluster

grouped in one or more content areas across classrooms, and assigned to classes with teachers who have had professional development and use strategies to meet their learning needs (Gentry & Owen, 1999). Separate classes can be provided for gifted students at any grade level. Interventions to attempt to reverse underachievement can be incorporated into counseling options, either during or after school, at the high school level. Students can have opportunities for advanced project work after school, or during a time that their curriculum has been compacted.

The second consideration in the development of a districtwide continuum of services relates to types of curriculum and learning opportunities, as decisions must be made about what will be taught and why (Renzulli & Reis, 1997). Educators must consider what they will do to adjust the curriculum and learning opportunities for advanced students. Will acceleration opportunities be made available? Will the regular curriculum be extended with enrichment, or will it be compacted and replaced with teacher-selected advanced content? Will students have the opportunity to pursue their personal interests using independent study?

Both of these considerations should be addressed when a continuum of services is developed in a district or school. If organizational structures are the only component addressed in a districtwide continuum of services, little thought will have been extended to essential instructional and curricular decisions. If students are grouped into a separate class for gifted students without any advanced or accelerated curriculum or instruction, little justifiable reason exists for that instructional grouping, as research has demonstrated that minimal gains will be made by those students (Gentry & Owen, 1999; Kulik, 1992). If a large percentage of gifted students are underachieving and are not able to participate in advanced classes, or are dropping out of school, an expansion of a district continuum of services should be considered to include more affective and counseling services to address their underachievement (Reis & McCoach, 2000).

Services in a Continuum Targeted for High Potential and Gifted Students

Some of the services that might be targeted for gifted and talented students are relatively inexpensive, some involve considerable time and funds, and others involve no cost at all, since they involve strategies for grouping and regrouping students based on their interests, ability, and achievement levels. Establishing opportunities for enrichment across the grade levels, and differentiation in all classrooms, constitute the first steps in the development of a continuum of services. This continuum can range from a minimal level of service in the regular classroom setting, to a series of advanced opportunities in the regular classroom, advanced learning opportunities in content, independent self-selected study, counseling for underachievers, and separate classes, a school, or a center for gifted learners (Renzulli & Reis, 1997).

School based gifted programs can offer diverse learning opportunities. The presence of enrichment specialists enable teachers to send students from their regular classrooms to spend time with other high potential students, giving them the opportunity for in-depth, advanced independent study projects and group projects in their interest areas (Renzulli & Reis, 1997). In some districts, students have the opportunity to travel to a center one day each week to work with other identified gifted and talented students on advanced curriculum, or to pursue individual

interests. These types of centers supplement the regular school program by providing differentiated educational opportunities for academically gifted students. In some centers, students spend one day each week at the center studying advanced content and exploring personal interests through independent study. When in their home/sending schools, these same students receive enrichment and acceleration experiences from their regular classroom teachers, who have been trained in gifted education pedagogy such as curriculum compacting (Reis et al., 1992), acceleration (Colangelo et al., 2004; Kulik, 1992) independent study (Renzulli & Reis 1997) and advanced content (Little et al., 2007; Reis et al., 2007; Renzulli, 1988; VanTassel-Baska et al., 2002), and mentorship opportunities in which an academically talented student is paired with an older student or adult with both an interest and expertise in the same area. As noted previously, cluster grouping and other forms of instructional grouping, with differentiated instruction and content, benefits gifted and talented students and helps also to challenge other students across all levels of achievement (Gavin et al., 2007; Gentry & Owen, 1999; Reis, Gentry et al., 1998; Reis et al., 2007; Gubbins et al., 2008; Tieso, 2002). Many principals and superintendents urge classroom teachers to use differentiated instruction and curriculum compacting across all grade levels, to ensure sufficient challenge to all students and to eliminate content that students already have mastered (Reis, Westberg et al., 1998; Tieso, 2002). Some schools provide after-school enrichment programs, or send academically talented students to advanced content Saturday programs offered by museums, science centers, or local universities.

A continuum of services for gifted and high potential learners can also include a number of challenging curriculum content options implemented in classrooms. Several research-based curriculum and instructional options have been developed in reading, science, social studies, and mathematics (Gavin et al., 2007; Little et al., 2007; Reis & Renzulli, 2003; Reis et al., 2007; VanTassel-Baska et al., 2002).

National programs that engage students in creative thinking and problem solving are also included on some continuums of service. These programs have enabled hundreds of thousands of students to apply problem-solving techniques to real-world problems in society, and in their communities. Although not intended solely for academically talented and advanced students, opportunities such as Future Problem Solving are widely used in gifted programs because of the curricular freedom and academic challenge associated with the problems that students pursue. Many gifted students have the opportunity to participate in National History Day, where they work individually or in small groups on an historical event, person from the past, or invention related to a theme that is determined each year. Using primary source data such as diaries or other archives gathered in libraries, museums, and interviews, students prepare research papers, projects, media presentations, or performances, as entries. Many school districts and states also have developed innovative programs that include a variety of services for high potential and gifted learners, such as mentorships, Saturday programs, and summer internships.

A recent innovation to challenge gifted and talented learners in classrooms, and in separate gifted programs, is a new online system designed to use strength-based assessment and differentiated learning experiences for gifted and talented students (Renzulli & Reis, 2007). Renzulli Learning can be used independently of SEM, and provides a computer-based diagnostic assessment to create an individual profile of each student's academic strengths, interests, learning styles, and preferred modes of expression. The online assessment, which takes about 30

minutes, results in a printed profile that highlights individual student strengths. The profile is then matched to a differentiation search engine that selects hundreds of resources that relate specifically to each student's interests, learning styles, and product styles. The search engine matches student strengths and interests to an enrichment database of 35,000 enrichment activities, materials, resources, contests and competitions, independent studies, and opportunities for research and follow-up. A project management tool, called the Wizard Project Maker, guides students and teachers to use specifically selected resources for assigned curricular activities, independent or small group investigative projects, and research studies. Students' work can be saved in an electronic portfolio. The system also offers many tools for teachers to more easily differentiate instruction and curriculum, and to group students by interests, abilities, and learning styles.

Summer programs also exist, such as the Talent Search at the Center for Talented Youth at Johns Hopkins University and Northwestern University, that actively recruit and provide program opportunities for academically talented youth. These students generally have scored highly on standardized tests and are recommended by teachers or counselors to participate in early assessment. They may be eligible for multiple options, including summer programs, acceleration, and college courses.

In most states, advanced, intensive summer programs are provided by Governor's Schools in specific content areas. The Pennsylvania Governor's Schools of Excellence, for example, offer different 5-week-long summer residential programs on college campuses. These programs are committed to meeting the educational needs of artistically or academically talented high school students. Many larger school districts also offer challenging summer programs for advanced and gifted learners. The National Association for Gifted Children has a comprehensive list of summer programs for academically talented students on their web page, as well as a comprehensive list of parent recommendations and research findings that district administrators can recommend to parents of talented students. Several states have created separate schools for academically talented students in math and science, such as the North Carolina School for Science and Mathematics, the Illinois School for Mathematics and Science, and the more recently created Kentucky School, which also targets mathematically talented students. Some large school districts have established magnet schools to serve the needs of academically talented students.

Summary

The research summarized in this chapter strongly supports the effectiveness of various interventions to challenge gifted and talented students. Unfortunately, current research also finds that gifted and talented students are often unchallenged in their classrooms (Archambault et al., 1993; Fordham Institute, 2008; Moon et al., 1995; Reis et al., 2004; Reis & Purcell, 1993; Westberg et al., 1993). This lack of challenge and programming can result in underachievement (Hébert & Reis, 1999; Reis & Diaz, 1999), suggesting a need for gifted education programs using both enrichment (Renzulli & Reis, 1997) and acceleration (Colangelo et al., 2004; Kulik, 1992) to help these students make continuous progress in school. An absence of teacher training and professional development in gifted education and curriculum and instructional differentiation strategies for classroom teachers results in fewer challenges, less differentiation, and lower

continuation of programs and services already in place, and a better understanding of what is needed to challenge every child and give each the opportunity to make continuous progress.

Questions for Future Research

- How can the needs of gifted and talented students be served in most classrooms, when teachers continue to focus on students who are achieving well below grade level?
- What is currently happening, and what might happen in the future, to challenge gifted and talented students in most regular classroom settings?
- In what ways might school psychologists be able to help gifted and talented students who are underachieving in school?
- Why is the identification of gifted students with disabilities so challenging?
- What is the Schoolwide Enrichment Model, and why is it a flexible plan for both identification and programming?
- What components should be included in a continuum of services for gifted and talented learners?
- Why is instructional grouping one strategy that should be implemented for gifted learners?

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