THE Fall 1999
NRC G/T
National Research Center on the Gifted and Talented
NEWSLETTER

There is probably one word that you have seen or heard on a daily basis since January 1, 1999. The word has taken on an almost prophetic quality. Web sites, newscasts, reporters, parents, children, educators, business people, and members of the community at large use it and react to it. "Millennium" is the recurring word. The word is interesting because of its prominence in discussions and documents and its potential effect on people's wishes, hopes, and dreams. What will the year 2000 be like? Will the visions of school and schooling change? How will we engage students in the intricacies of learning in such a fast-paced world? What type of content will ignite their interests and motivate them to continue learning?

As we think about the year 2000 and beyond, we reflect on our accomplishments and the work that still needs to be done. Since 1990, The National Research Center on the Gifted and Talented has launched several studies to gain a better understanding of how to

- develop appropriate techniques to identify students' talents and gifts,
- improve classroom practices by studying ways to create high-end learning opportunities for students, and
- guide programs and services for gifted and talented students by evaluating program impact, grouping practices, and affective needs.

NRC/GT Through the Year 2000

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Under the Jacob K. Javits Gifted Students Education Act, the priorities were students who were historically overlooked by traditional assessment methods (including economically disadvantaged individuals, individuals of limited English proficiency, and individuals with disabilities). We have studied classrooms at all grade levels in urban, rural, and suburban environments, observed students working in various content areas tailored to their needs, and developed professional development techniques that were integrated in lesson design and instructional techniques. Setting these priorities was certainly a collaborative effort.

Researchers, practitioners, parents, business leaders, and others guided the creation of our research agenda. The needs assessment process is described in *Setting an Agenda: Research Priorities for the Gifted and Talented Through the Year 2000* (Renzulli, Reid, & Gubbins, 1992). The resulting agenda continues to inform our qualitative and quantitative studies. Research priorities include:

- impact of gifted programs on student outcomes,
- regular curriculum modifications,
- professional development necessary for curriculum modification or development, and
- grouping patterns and impacts on learning outcomes.

Words and numbers form the critical mass of what we have learned about young people's talents and abilities. Our research findings fill volumes of books, journals, and newsletters; use considerable space on multiple zip disks; and end up in homes, schools, businesses, and libraries. Yes, NRC/GT information is stored on computers; captured on film, printed on paper; and recorded on audiotapes. Topics of interest can be studied further as desired. Over 408,000 copies of our products have been requested. Information seekers then use the data as they work with young people, guide the progress of their children's talents and abilities, or extend the findings by conducting similar studies in their own region, state, or country. NRC/GT data will be there beyond 2000 or 2001 (as the next millennium begins).

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I N S I D E

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Finding meaning and relevance in all the words and numbers takes time. You just can't scan a research monograph quickly and link it to your current situation. You need to really understand how conclusions, guidelines, or recommendations were determined. If you visit our web site (www.gifted.uconn.edu), choose The National Research Center on the Gifted and Talented, then select Abstracts, you will see a very long list of publications. Click on topics of interest by title or author, then review the brief abstracts and the major guidelines, recommendations, or conclusions. You can download the information or read it on your computer screen. When people ask questions about identification, programming, curricular modifications, acceleration, grouping, underachievement, or other topics, we direct them to our work or to that of other researchers and scholars. Obviously, our research studies only represent a small fraction of information about bright children and youth.

Our NRC/GT web site is similar to "Cliffs Notes" used by so many of us who needed to be reminded of the key points in a novel for an undergraduate course. For example, recommendations or conclusions related to the following research priorities include:

Impact of Gifted Programs on Student Outcomes

1. A strong program begins with an administrator who is an advocate of gifted education. The administrator must be able to describe the needs and characteristics of gifted children and elicit support from the district and community.

2. Gifted and talented children have special characteristics that require different strategies. Teachers need to be aware of the needs and various options available for meeting these needs.

3. Identification and program activities should be sensitive to the needs of diverse populations of gifted and talented children. Culturally diverse and economically disadvantaged students should be actively recruited. (Delcourt & Evans, 1994)

Grouping Patterns andImpacts on Learning Outcomes

1. Achievement and underachievement are not disparate concepts. Talented students in an urban high school experienced both periods of achievement and underachievement throughout their school careers.

2. High ability students who achieved acknowledged the importance of peers in supporting and challenging them to succeed and the positive effects of being grouped with other students of similar abilities.

3. High ability students who underachieved in high school acknowledged that their underachievement began in elementary school when they were not provided with appropriate levels of challenge.

4. The abilities of high ability students who underachieved were often unrecognized by their parents, teachers, and guidance counselors during their elementary years. (Reis, Hébert, Díaz, Maxfield, & Ratley, 1995)

We would like to know more about how you have used our research. We want to give you time to think about the research-based books, articles, newsletters, videos, and web site produced by The National Research Center on the Gifted and Talented. The questions that need to be addressed focus on impact:

- What is the impact of the NRC/GT research?
- How have you used the data?
- To what extent have our research findings changed your approach to teaching?
- To what extent have you used our research findings to review and modify your curricular options?
- To what extent have the suggestions about identifying and serving gifted and talented persons influenced your policies and procedures?
- To what extent have multiple forms of dissemination (e.g., monographs, videotapes, newsletters, web site, and presentations) of research findings been effective?
- To what extent have our research products contributed to your knowledge about gifted and talented young people?

"High ability students who underachieved in high school acknowledged that their underachievement began in elementary school when they were not provided with appropriate levels of challenge."

- To what extent does our work contribute to your knowledge or understanding of educational issues related to identifying and serving students with high abilities?

Tell us your story via e-mail, web site, fax, phone, or letter. Our phone numbers and address are listed on page 16. You helped us determine our research priorities almost a decade ago. So now as we approach the millennium, it is important for us to understand what you have learned and how you have benefited from our research. Check our web site (www.gifted.uconn.edu) for survey questions. We hope to hear from you.

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What's in a Word?

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A recent issue of the NRC/GT Newsletter (Dinnocenti, 1998) contained an article that featured definitions of Renzulli's (1997) Five Dimensions of Differentiation. This article provides a list of additional terms and definitions commonly associated with differentiation.

Acceleration– The opportunity to be grade skipped, cross-grade grouped, explore independent studies, complete 2 years in one, early entrance to kindergarten, etc.

Assessment– Methods to determine mastery or prior knowledge of skill or content. Common methods used include pre-tests, performance based, oral, written, or observational assessments.

Compacting– Determining goals of curriculum, assessing student mastery, and providing enrichment opportunities.

Curriculum– District or state agreed upon content areas that are organized by goals and objectives for each grade level K-12.

Differentiation– Matching the given content area with a student's interests, abilities, and learning styles through various instructional strategies.

Enrichment– Activities related to student's curriculum or interest area that involve higher level thinking skills and guided problem solving.

High Ability– The capacity to see abstract relationships, make connections through critical analysis, and formulate original hypotheses.

Individualized Instruction– Customizing the curriculum to student's learning style, social-emotional concerns, interests, abilities, potential, creativity, and task commitment.

Instructional Style– Method of delivery used by teachers to stimulate learning within and beyond the classroom.

Modification– Changing the existing curriculum either by expanding the depth or breath of the content area.

Objectives– Outcomes or behaviors that students attain by becoming successfully involved in the learning process.

Zone of Proximal Development– Difference between actual developmental level in independent problem solving and the potential developmental level with scaffolding or guidance by an adult or more capable peer.

References

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Inventive Differentiation

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Young minds are full of promise and creativity. Many educators have chosen to capitalize on these characteristics by devising curricula based on the process of inventing. Organizing "young inventors workshops" or Invention Conventions provides students with a creative outlet that strengthens skills such as problem solving, critical thinking, and research skills. These activities also benefit the school community by providing a catalyst for innovation and social contributions.

Organizers of such events must remember that although student participants are selected on the basis of common interest, it remains imperative that such commonalties don't overshadow the need for differentiation. Differentiation can be achieved through the use of technology, extension activities such as researching a specific invention, studying an inventor of interest, or investigating the impact of certain inventions on society. These options will create meaningful experiences for young inventors as well as their peers.

What Is An Invention Convention?

Just inside the door, you descend a few steps and find yourself in the midst of a sea of people. This is no ordinary crowd; children wide-eyed and nervous flanked by harried adults toting scads of paperwork and odd contraptions. Youngsters and their guardians queue up to receive directions, then are directed through a set of blue double doors off to the right, "tchatchke" in hand. What awaits them inside is nothing short of awe-inspiring!

Welcome to the opening hours of an Invention Convention. These events are state-wide competitions for students in grades K-12 who created original inventions that were subject to school-wide judging. Last year's Connecticut Convention included over 450 students from across Connecticut with inventions in categories ranging from safety devices to new applications and adaptations of technology.

While this event is open to any student with both an interest in inventing and the task commitment to see a project to completion, students displaying gifted behaviors are prime candidates for participation. There are a number of different competitions at state and national levels, each with a common goal: to stimulate and support the development and application of creative and critical thinking to real-world problem solving. These competitions are sponsored by a variety of organizations, from educational foundations to civic-minded purveyors of high technology.

But where do you go with an exceptional student who performs the various activities included in the competition literature, then looks at you as if to say "Now what?" Many teachers realize how important it is to differentiate instruction within the classroom, according to criteria such as interest, prior knowledge, ability, or final product. But what do you do with instructional units from invention organizations that are already interest-based? Though generally well-designed, materials provided by these organizations are not without their shortcomings. Teachers should be encouraged to tailor the experience to students' needs and interests.

Why Differentiate a Unit on Invention?

Well, why not? In an ideal world all units of instruction, regardless of content, would be differentiated. A problem that teachers often run into is fueled by the mistaken belief that if you're going to differentiate a unit, you must change every single facet of it, in every conceivable manner. As nearly impossible (and most certainly impractical) as it would be to include every essential vitamin and mineral in processed foods, so it is for differentiation strategies. Teachers should alter lesson content, process, and/or product according to unit objectives and students' learning characteristics. If a segment of the unit meets learner needs, then one should focus time and energy on the sections that truly need to be reworked. Since the unit is already differentiated according to interest and final product, consider customizing it according to ability, prior knowledge, or teaching method. For instance, an ambitious teacher could construct a simulation activity wherein student inventors were participants in an apprenticeship to Thomas Edison in his Menlo Park, NJ laboratory, experiencing the magnitude of this great inventor's fervor.

"In an ideal world all units of instruction, regardless of content, would be differentiated."

Inventing as a school activity can be a great "equalizer." Students of all levels work toward the common goal of realizing their creative potential. Students who enjoy writing may be surprised by the challenge of expressing their ideas in a graphic format. Students who are master model-makers may find the task of using words to describe their ideas truly daunting. Differentiation is the single most effective means of addressing various levels of comprehension and performance.

The materials from the Connecticut Invention Convention, Invent America!, and other organizations serve as guidelines for teachers who organize competitions within their school. These materials contain basic lesson plans and suggestions for extension activities. One might consider them pre-differentiated, but this is not always the case. Since competition is not limited to students with high abilities, classroom teachers or convention facilitators should be ready to create their own extensions or support activities to meet students' needs.

"Do I Have to Do This *Again*?"

For those capable students who have already been exposed to the invention process (through research or participation in activities), the redundancy of many units' initial stages, in particular, is at best dull, at worst a threat to their creativity and interest level. While the unit may not be a formal part of the curriculum and therefore relegated to the elusive "spare time," some form of preassessment is useful in determining how to allocate student time.

Preassessment can come in many forms. For instance, a "KWL" chart ("What do I already know? What do I want to know? What do I need to learn?") enables students to indicate those things to which they've had exposure, as well as areas that may require more coverage. It will also help as a reminder of originally interesting ideas for those students undertaking a more intensive research-based project. Using a numeric scale to rate the difficulty of certain inventive tasks helps teachers to determine weaknesses and allows students to pursue strength areas. Students requiring a greater level of support can proceed with the prescribed creativity exercises outlined in many invention materials, such as SCAMPER (Substitute, Combine, Adapt, Modify, Put to Other Uses, Eliminate, Rearrange, Eberle, 1972). Those for whom this initial instruction is unnecessary may proceed to activities that involve different aspects of their creative abilities, such as new applications for previously learned techniques, or alternative scenarios in which they may be applied.

"Can I Do It *My* Way?"

Preassessment is great, just as long as you take it to heart. Once you recognize the diversity among your students, you then must adjust your objectives and instructional techniques. Being flexible in what you want your students to accomplish also requires you to be flexible about their resources. It is important that you allow students to use whatever media are appropriate to their learning and expression styles and your instructional goals.

Who says that the objective behind inventing must be the same for every student? Although every invention unit aims to capitalize on students' creativity and introduce them to creative problem solving and critical thinking, objectives should go further. Do you want your students to have an opportunity to work with a mentor? Do you feel some must be challenged to produce an invention that has social significance? Are there students for whom mere completion of the task is the "real" desired outcome? There may be as many underlying objectives for students' participation in the activities as there are fingers on their hands. Units on invention can often be equalizing among heterogeneous student populations.

Teachers should be willing to utilize a multitude of media, especially during the initial phases of instruction. Individual or small group research on specific famous inventors (or the creators of famous inventions) is popular and students should be allowed to use more than just print resources for their research. If space and time permit, set up a listening or viewing station accessible by all students at various times during the day. Stock it with videos and/or recordings of resources, *primary* ones if at all possible. Check out the Massachusetts Institute of Technology's *Invention Dimension* web site (http://web.mit.edu/invent/www/links.htm) for a list of links to excellent multimedia resources, including sites featuring female inventors and inventors of color. While reading an inventor's own words is meaningful, hearing the voice or seeing the person delivering these words is absolutely powerful.

Various computer programs assist students with different parts of the invention experience. *The Incredible Machine* and *The Incredible Machine 2* (Jeff Tunnell Publications, 1994) are two pieces of software that present students with a solution that requires a Rube Goldberg-esque approach. Using software such as *Inspiration* (Inspiration Software, 1997) to guide students' thinking with graphic organizers helps them to focus on ideas rather than struggle with a way of recording them on paper.

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"Is There an Inventor Like Me?"

Pick up a typical children's book on invention and you will find a list of inventors that always seems to include such noteworthy individuals as Thomas Edison, Alexander Graham Bell, Henry Ford, etc. Rarely do you find a list that includes a member of another ethnic group or a female. Regardless of your classroom demographics, it's important to introduce students to a variety of inventors, not just those falling within the category of the well-known.

How many students realize that aside from Dr. George Washington Carver and his famous experiments with peanuts, there exists a cadre of inventors of color whose achievements are as diverse and significant as their White male counterparts? An African American inventor has impacted every individual who has ridden on an electric train or gotten a permanent wave. The Chemistry library at Louisiana State University has set up a bibliography of Black inventors that may be accessed at http://www.lib.lsu.edu/lib/chem/display/inventors_bibliography.html. It is very important to have balance in the study of inventors, because no one person or group has a monopoly on creativity or ingenuity.

Often the specific needs of girls are overlooked when developing and implementing units on mathematics and science. This can be true again when considering a unit on invention, as women inventors are traditionally underrepresented in the related literature. Both girls and boys should be exposed to women inventors and the ingenious and important contributions they have made to modern society. Up until the late 19th century, the vast majority of inventions created by women dealt with improving upon the conditions found within the household. As time progressed, women's contributions diversified into the fields of medicine, engineering, chemistry, computer science, and many other areas. We have women to thank for the invention of an at-home test for diabetes (Helen Murray Free) as well as the COBOL computer language (Grace Murray Hopper). It's important for students to focus on some relative unknowns. Encourage them to choose an invention of particular interest and trace its roots or to focus on an inventor who isn't as well known as most, and investigate the impact on his or her field.

How Do You Marry Technology and Invention?

How short-sighted it would be to discuss a unit on the invention process and neglect to mention technology. It's both the result of and impetus for invention! Aside from the usual application of word processing, technology can and should play a significant role in how a student undertakes his or her project.

For starters, public and school libraries nationwide are moving toward replacing their large drawer-filled card catalogs with computer terminals that allow for streamlined, speedy searches for specific materials. These terminals require specialized, albeit simple, knowledge to operate them, skills which students can easily master. The nice thing about this is that the Boolean search techniques (strings of search terms separated by the words AND, OR, or NOT) used with library catalogs are the same techniques that may be used to search the World Wide Web. Students mastering the use of the library's terminals can generalize their search skills to the broader realm of the Internet.

One resource that cannot be overlooked is the World Wide Web. With a few simple keystrokes, students can connect with information on famous inventors, museum exhibits, curators, and professionals with expertise in many related fields. One fantastic web site is the Massachusetts Institute of Technology's *Invention Dimension* (http://web.mit.edu/invent/www). It is an extensive source of information on inventors past and present, related links and resources, and the best part is that it is searchable. This access is limited only by surfing time and the speed of one's computer.

Perhaps best of all, the Web joins students together into communities based on common interest. Communities dedicated to the spirit of invention and its application exist in many forms, such as bulletin boards and chat groups. All standard caveats apply with regards to internet safety, however, students shouldn't be discouraged from trying to locate a fellow inventor when given the time and supervision. Most sites are maintained by organizations or individuals dedicated, through work or hobby, to the perpetuation of innovation by students and others.

Finally, another application of technology is graphic design. Students may use computers as a source of graphics for their displays or as a tool to help them design their own. Computers allow students to save multiple manifestations of their ideas in an infinitesimal amount of space (too bad that doesn't work for their prototypes!) and, like photocopiers, allow an almost infinite ability to modify the size of an image. Even young students can have neat and eye-catching displays regardless of their fine motor control.

If your students are to utilize computers in this manner, they are going to have to be comfortable doing so. One way of providing the necessary support while bolstering the relationship they have with students from different classes is

to set up a computer mentorship program. Pairing able students with those just starting out allows the able students a chance to share their skills while learning about their friend's invention. The inventor is able to practice communicating ideas to a student colleague and learns valuable computer skills in the process. Best of all, the mentor may not necessarily be older than the novice, nor a fellow inventor. This interaction is a neat way to showcase learning and a great advertisement for the invention program!

Do Inventors Need Equal Parts of Creativity and Novel Ideas?

While all students participating in an invention activity should possess equal parts of creativity and novel ideas, this is where the similarity ends. Students of varying academic, social, and interest levels must be accommodated through differentiation techniques. Challenging capable students to delve into the deeper facets of the process, varying the procedures and outcomes and encouraging critical thinking skills are ways in which this experience can be made more meaningful for all involved. Using technology and the wide array of resources available today, teachers can customize students' inventing experiences to suit their interests. Organizing and implementing a unit on invention can be a large and complicated task. With assistance from willing colleagues, parents, and others, students at all ability levels who are armed with a sense of creativity and commitment can succeed.

Resources

For those both in and outside of Connecticut, additional information may be obtained from the following sources:

- The Connecticut Invention Convention, c/o Phoenix Duff & Phelps, Mailstop 2E207, 100 Bright Meadow Blvd., Enfield, CT 06083 or call 860-793-5299.
- Invent America! Headquarters, 510 King St., Suite 420, Alexandria, VA 22314 or call 703-684-1836.

Print resources:

Bean, S. M., & Karnes, F. A. (1995). *Girls and young women inventing.* Minneapolis, MN: Free Spirit Publishing.

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Eberle, R. F. (1972). *Scamper: Games for Imagination Development.* Buffalo, NY: D.O.K.

Goldberg, R. (1979). *The best of Rube Goldberg.* Englewood Cliffs, NJ: Prentice Hall.

MacDonald, A. L. (1992). *Feminine Ingenuity: How women inventors changed America.* New York: Ballantyne Books.

Marzio, P. C. (1973). *Rube Goldberg, his life and work.* New York: Harper & Row.

Electronic resources:

GirlTech, Inc. (1999). *Girltech's Girl Inventors* [On-line]. Available: http://www.girltech.com/HTMLworksheets/IN_inventors.html

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Louisiana State University Libraries. (1996). *African American Inventors Bibliography* [On-line]. Available: http://www.lib.lsu.edu/lib/chem/display/inventors_bibliography.html

Massachusetts Institute of Technology. (1999). *MIT's Invention Dimension* [On-line]. Available: http://web.mit.edu/invent/www

University of Wisconsin, Milwaukee. (1999). *Great African American Inventors* [On-line]. Available: http://www.uwm.edu/StudentOrg/NSBE/bie.html

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NEWS BRIEFS

The second edition of *Understanding Those Who Create* by Jane Piirto is now available from Gifted Psychology Press. This 464 page volume describes the nature of creativity and ways to measure it. The author presents strategies to enhance and nurture creativity in children. For more information, contact Gifted Psychology Press, P.O. Box 5057, Scottsdale, AZ 85261, phone 602-368-7862.

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Gifted Grownups: The Mixed Blessings of Extraordinary Potential by Marylou Kelly Streznewski reveals the findings of a 10-year study of 100 gifted adults and examines how being identified as a "smart kid" early in their lives influenced their career choices, friendships, and romantic pairing later in life. The author explores why some gifted and talented people become Mozarts, and Einsteins, while others drop out of school, struggle to hold down jobs, or turn to self-destructive behavior. *Gifted Grownups* is published by John Wiley and Son, ISBN 0-471-29580-9.

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A list of products from the Education Publications Center of the U.S. Department of Education is available by web (www.ed.gov/pubs/edpubs.html) or phone 877-433-7827.

Mentorship at Its Best

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Imagine being a second year teacher and facing 20 high school juniors. After graduating from the University of Texas–Austin the year before, you find yourself being only a scant 6 years older than the students you have been entrusted to lead. What you face are the survivors of a class that started kindergarten with twice as many members, but somehow over the years, nearly half of your students' classmates have dropped out of school. What remains before you are students who still embrace the American dream that education will change their lives and who are willing to invest at least one more year to give it that chance. These same students have parents who are laborers and farmhands and are primarily Mexican-American. Nearly every student comes from a family that lives below the federal poverty level, and where most adults don't have a high school diploma (Arrillaga, 1997).

Since you are teaching an advanced English class, you realize your students' potential is only limited by their determination to learn. What can you say or do that will promote a vision unlike any these students have ever envisioned?

According to *Wall Street Journal* writer Patrick Barta (1997), for the past 10 years, "while the Anglo elite in McAllen, Texas was sending its sons and daughters to the University of Texas–Austin, Southern Methodist University, or the Ivy League, the offspring of local Hispanic families were swelling the ranks of the University of Texas-Pan America in nearby Edinburg." Barta's article continued with a comparison between what are now The University of Texas-Pan America and City College of New York. He described both universities as gateways to the middle class. Until a month ago, I would have agreed with Barta's analysis of how recent generations of this region's long-disadvantaged Hispanic majority have remained in the Lower Valley to continue their education. But, that was before I learned about Francisco Guajardo, a second-year teacher at Edcouch-Elsa High in the Lower Rio Grande Valley.

One Teacher With a Vision

Francisco Guajardo, a high school Advanced English teacher listened, learned, and acted upon information shared by his high-ability Hispanic students. Without fully realizing the impact of his decisions, Guajardo guided his students through the higher education maze and led them to heights beyond their wildest expectations. Without expecting personal gain, Guajardo offered his students: encouragement; a way to make the unfamiliar familiar; an opportunity to travel; and a chance to visit Ivy League campuses and personnel. Because of his mentorship, a new generation of highly educated Hispanic students has begun in south Texas. The impact of his willingness to get involved with the social, emotional, and professional needs of his students deserves recognition and reflection.

Under the mentorship of Guajardo, 17 students from the second-poorest school district in Texas, with only 1,400 students, have attended or are currently attending Ivy League schools (Arrillaga, 1997). It all began with a simple question that Guajardo asked on that first day of school. "What are your college aspirations?" Guajardo's class responded with situational, logical, cost, and family related constrained responses. The majority of his students intended to continue their education at the University of Texas-Pan American (UT-PA). After listening to the students describe their dreams, Guajardo supplied a new one. "Why not attend one of the prestigious Ivy League schools?" With this simple question, an unsolicited mentorship began that encouraged risk-taking and challenge. Before Guajardo could expect his students to embrace the dream he held, he had to establish their trust and reduce their apprehensiveness. To do this, he suggested a trip east over the summer to visit some Ivy League universities.

During the next eight months, Guajardo's students raised money to fund their exploratory trip to the Northeast. The image of an excited, scared group of 17 and 18-year-olds leaving the Lower Valley for the first time on a four-day cross-country trip is easy to project. The group's intentions were to visit Brown, Columbia, Dartmouth, Yale, and Harvard. The first year, all nine of the students who accompanied Guajardo in a rented 15-passenger van applied to an Ivy League school. "Six were accepted" (Arrillaga, 1997). That first trip opened the door for many others.

"Without fully realizing the impact of his decisions, Guajardo guided his students through the higher education maze and led them to heights beyond their wildest expectations."

Currently, six students attend Brown, four students attend Columbia, five students attend Yale, and one student is at Harvard. Because of Guajardo's successful mentorship, other school districts in the Lower Valley are currently examining ways to provide similar opportunities for students.

The Implementation of Mentoring

Throughout history, as autobiographies and biographies have appeared, mention is often made of someone who influenced the eminent person's life. Although the famous individual becomes a legend, the mentor seldom receives credit for the impact he or she made on another's life.

As a teacher educator, I am particularly interested in the pedagogical experiences that shape and guide talent and in methods mentors use to encourage and promote outstanding mentee accomplishments. Doubtless, an important, indispensable element of achievement is related to ability and determination, but significant events and experiences must also be recognized for the impact they have on an individual's life.

A number of types of mentoring are commonly discussed. Galbraith and Cohen (1995) describe mentoring as "a deliberate effort to support traditional and nontraditional students from diverse backgrounds in formal and informal settings" (p. 5). Carmin (as cited in Caldwell & Carter, 1993) takes the concept of mentoring further by including a number of variables in his definition. He states:

> Mentoring is a complex, interactive process occurring between individuals of differing levels of experience and expertise which incorporates interpersonal or psychosocial development, career and/or educational development, and socialization functions into the relationship. This one-to-one relationship is itself developmental and proceeds through a series of stages which help to determine both the conditions affecting and the outcomes of the process. To the extent that the parameters of mutuality and compatibility exist in the relationship, the potential outcomes of respect, professionalism, collegiality, and role fulfillment will result. Further, the mentoring process occurs in a dynamic relationship within a given milieu. (pp. 10-11)

Torrance, Goff, and Satterfield (1998) define mentors as "influential people who significantly help us reach our major life goals. They have the power to promote our welfare, training, learning, or careers and are usually identified as having outstanding knowledge skills, and expertise in a particular domain or area" (p. 4).

Dogson (as cited in Caldwell & Carter, 1993) distinguishes between life and career mentors. "Career mentors have an interest in the career progression of the protégé. Life mentoring subsumes career mentoring and has in addition an interest in the life development of the protégé. Life mentors are also career mentors, but the reverse is not true" (p. 12). Dogson believes that there are three ways to form a relationship between a mentor and mentee. "These are: a) those which are initiated by the protégé, b) those initiated by the mentor, and c) serendipity" (p. 13). The mentor-protégé relationship that developed in the Edcouch-Elsa School District was initiated by the mentor, Francisco Guajardo, who helped a number of students reach major career goals.

The Need for Tacit Knowledge

Research has shown that high-ability, minority students often lack tacit information about educational opportunities and procedural requirements that would lead to an enhancement of their professional goals. Until recently, questions related to students' social and emotional needs were considered only when a recommendation for grade acceleration was being considered. To eliminate and recognize the social and emotional fears that sometimes stand in the way of students' educational opportunities, teachers must recognize more than just ability; they must also understand the culture and socioeconomic background of their students.

Six years have now passed since Guajardo began his one man campaign for change and enrichment in the lives of his students. Since that time, financial support for his yearly trip is now supported by local lawyers and doctors. Thus, the list of supportive mentors has grown and Guajardo now spends time counseling students and writing grants.

In response to a letter of congratulation and appreciation that I sent to Guajardo, he wrote

> My mission as a high school teacher has been to raise my students' level of expectations. It is perhaps the toughest objective for teachers, but it can be done. It simply requires work, work, and then more work.
>
> Even with all the work, however, we must do more; we must develop relationships with our students. When we have a working relationship with a student, we gain their trust. Only then, will they truly believe us when we tell them they belong in a place such as Yale, Harvard, or

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> Columbia. Simultaneously, we must develop relationships with parents, because they too have to be sold on the extraordinary. There are no shortcuts. And it's entirely possible for just about any kid. (F. Guajardo, personal communication, October 3, 1997)

Thus, Guajardo's pattern of planting the seed with his high school juniors, providing an opportunity, then nurturing parents to believe in the dream is supported by research (McLeod, 1987; Wang, Haertel, & Walberg, 1994). Gándara (1995) found that not only parents, but also older siblings contribute to the success of high ability Hispanic students.

Now, six years after Guajardo's first group of students went east to continue their education, the fruit of his efforts is being harvested. Some of his first crop of students, now Ivy League graduates, have returned to the south Texas Rio Grande Valley to begin their careers and to mentor their brothers, sisters, cousins, and friends. If there is ever a doubt in your mind as to whether mentoring works, plan a trip to south Texas and visit with Francisco Guajardo at Edcouch-Elsa High School. Very soon, your doubts will disappear.

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Extraordinary Gifts Often Come in Plain Brown Wrappers

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Giftedness is a concept that has fascinated, perplexed, and even infuriated us as a nation. We are fascinated by the acumen of the young scholar, capable of processing inordinate amounts of information, ultimately engaging us in dialogue far beyond our pre-conceived perceptions of the individual's ability. We are perplexed by the virtuoso, capable of performing at levels unimagined by renowned experts in the various fields. Yet, many of us are sometimes infuriated by our continued focus on the high achiever, at what we perceive to be to the detriment of the average or low achiever. Regardless of our stance on this topic, we all have been exposed to individuals displaying extraordinary abilities in some area of selected interest.

A primary means of identifying and subsequently cultivating giftedness has been through assessment and enrichment initiatives. Individuals are typically assessed at some point along the K-12 continuum. The assessment procedure is followed by placement in courses with a curriculum designed to buttress those identified gifts and talents and to subsequently provide the students with the necessary challenges to reach their academic potential. Although we have made great strides in educating gifted students at the K-12 level, we have not made a concomitant effort to assess and cultivate gifts and talents at the postsecondary level, especially the gifts and talents displayed by the African-American postsecondary student. We seem to collectively ignore the giftedness displayed by students during the K-12 experience once they enter the halls of academia.

If our focus does happen to highlight the gifted, it is typically relegated to an honors college director who often prescribes a dose of accelerated courses, followed by an elixir of community service. According to Ford, Webb, and Sandidge (1994), "the psychological, cultural, and social issues confronting gifted college students have received only scant attention. One of the more plausible explanations for this paucity is the myth that gifted college students have no problems" (p. 36).

Another widely held assumption is that gifted students leave behind their gifts and talents once they become 18 (Daniel, 1985). Yet, do we in higher education concern ourselves with the social, emotional, and psychosocial issues these students confront? Does the gifted student experience college in a manner much different from the typical college student? More specifically, does the academically gifted African-American student experience college in a manner much different from the typical college student?

In a recent qualitative research investigation, I uncovered a number of issues confronted by two academically gifted African-American male college students. This study focused on these students' perceptions of how their respective institutions cultivated their academic giftedness. Phenomenology was selected as the theoretical orientation to guide the study. Phenomenology addresses the structure and essence of an individual's experience of a particular phenomenon. The phenomenon selected for the investigation was a relationship—the relationship these two students maintained with their institutions (Patton, 1990).

Before I briefly share my findings, I must reveal the limitations of the study. The focus of this research investigation was limited to the perceptions of one academically gifted African-American male undergraduate student attending a Historically Black College and University (HBCU) and one academically gifted African-American male undergraduate student attending a Traditionally White Institution (TWI). These two students serve as case studies representing unique individual contexts and experiences, thus findings are not meant to be representative of every institution of higher education in the nation, nor are they representative of every academically gifted African-American male undergraduate.

Although giftedness is recognized from an array of different perspectives (e.g., Gardner's Multiple Intelligences, Renzulli's Three Ring Conception, Sternberg's Triarchic Theory, Tannenbaum's Five Factor Theory), and through a myriad of different identification procedures (e.g., achievement, creativity, and intelligence tests; parent, peer, self, and teacher nominations; and product evaluations), this study focused on academic giftedness. Sometimes referred to as schoolhouse giftedness, academic giftedness can be measured by IQ or other cognitive ability tests (Sternberg & Davidson, 1986).

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Through observations, interviews, and the collection of written documents, findings from the study revealed six emergent categories relating to the students' perceptions of how their institutions had cultivated their academic giftedness. The first category was **relationship with faculty**. Perhaps the most telling piece of information in the entire study, both students overwhelmingly reported that an on-going relationship with the faculty was the most important factor in encouraging their academic achievement.

One case study participant attending reported, "If I had problems outside the classroom, I could go to any of the professors. They really instilled the confidence within me." The literature suggests that the impact of faculty on student norms, values, and attitudes, as well as faculty members' impact as role models, is enhanced when student-faculty interactions extend beyond the formal classroom setting (Pascarella, 1980).

The second category uncovered was **peer relationships**. Genuine relationships within and outside the students' disciplinary fields were necessary for reasons ranging from personal wellness to academic support. The importance of these relationships was revealed in the student's statement, "When it comes time for studying, it's always good to study in groups or something like that. If I didn't know something, I could always call one of my classmates, you know other students . . . they're real important."

The peer support system was viewed as a significant factor in the overall higher educational experience of both students, regardless of the two different institutional contexts. The weight of evidence is quite clear that both the frequency and quality of the students' interactions with peers and their participation in extracurricular activities were positively associated with persistence in matriculating and subsequently graduating from an institution of higher learning.

The third category cited in the study was **family influence and support**. Participants drew heavily on their immediate family unit—father, mother, brother, and sister. The maternal influence was cited in both cases as the primary source of encouragement and support on academically and non-academically related issues, although the father was a present and active participant in the lives of both student participants.

In commenting on the influence his mother exerted on his academic achievement, one student posited, "I use the same patterns that she started me out with when I first got in school—as far as kindergarten. I use the same ones up in college [sic]. I haven't changed. I was actually asked a question about that earlier last semester and they asked me how do I make a GPA or why is it that I am so studious and . . . it all goes back to my mother." According to Kulieke and Kubilius (1989), while there is little direct work on the values espoused by gifted or creative individuals, their parents tend to espouse values related to the importance of academic achievement, working hard, success, and being active and persistent.

The fourth category identified was **factors influencing college selection**. This category revealed the rationale behind their selection of their respective institutions. A litany of factors was mentioned, including institutional location and size, number of minority students, parental affiliation, and campus climate. The students perceived that each of these factors would have a direct impact on their success and the cultivation of their academic giftedness. For example, one respondent reported, ". . . since I have been going here, I'm really glad. I am more able to understand the subject at hand as opposed to a large campus. I had classmates to attend large schools and they are way behind because they don't have any type of reaction [sic] . . . I mean interaction with their professors, they are just basically numbers and I didn't think that would be good for me or my understanding of certain things." The other respondent reported, ". . . Since both of my parents are alumni of this institution, they kind of said, 'Oh, you gotta go to my alma mater' or something like that . . . and I was always hearing how, you know, my school is 'number one'."

The academically gifted African-American male attending the HBCU intimated family tradition, institutional history and mission, and the campus ethos to be the prevailing factors in selecting the institution. Harvey and Williams (1989) found that certain features of Black campus life—a

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participatory ethos, an inclusive environment, an expectation of success, and an incorporation of a rich historical tradition make these institutions the favored choice of many students. The academically gifted African-American male attending the TWI asserted that demographics, including campus location and size, prevailed in his institutional selection process. He reported a desire to attend a racially diverse institution, but one that provided an environment conducive to academic growth.

The fifth category was **self-perception**. The students' reports ranged from, "I guess you could call me gifted" to "I have a lot to improve on, but I like myself." This category was instrumental in uncovering emotions, feelings, and perceptions held below the surface, beyond the immediate facade the case study participants presented. Both students advanced positive notions regarding their self-perception; institutional context did not appear to differentially influence the positive self-regard reported in their statements. The articulated self-perceptions appeared to serve as important building blocks, essentially the scaffolding these individuals used to affix their academic achievement.

The final category was **institutional environment**. The students reported the institutional environment as collaborative at the HBCU and competitive at the TWI. Research uncovered a strong desire for a healthy mix of collaboration and competition among students on the college campus. While the HBCU is able to develop supportive institutional climates for Black students without sacrificing academic standards or intellectual capacity, the TWI often presents an environment that is intellectually oriented, achievement oriented, independence oriented, and competition oriented (Hughes, 1987).

While the participant attending the HBCU reported, ". . . it's a good feeling to be in a partnership with the other students," the participant attending the TWI lamented, ". . . you've got to be ten times as smart as anybody else, especially somebody White, because there is always going to be some type of favoritism or some type of leeway being given to them." These statements illustrate very different views of the respective campus environments.

Higher education can no longer afford to disregard the unique issues presented by its student populations. A good place to start in addressing these issues is at the very core of the institution, the core representing the mission. Regardless of arbitrary monikers such as Research I or Baccalaureate II, the overall mission of any academy of higher learning should address student learning. Yet, we must recognize that student learning is a holistic process that takes into account differences in the learner, differences in the environment, and differences in the instructional process.

This study highlighted the experiences of two academically gifted African-American male undergraduates attending two postsecondary institutions. Findings from the study point to the importance of creating educational environments within the academy that attract, satisfy, and sustain all of our student constituent groups. By identifying and meeting the exigent needs of such special populations as the academically gifted, African-American male undergraduate, the entire student population will reap the benefits of enhanced learning and development.

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Curriculum Compacting: A Necessity for Academic Advancement

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Unfortunately, the reward for many students who master coursework quickly is more of the same. It is little wonder that academically advanced students often report feeling bored and unchallenged (Plucker & McIntire, 1996). Instead of completing work quickly that they know they have already mastered, they sometimes become disenchanted, mentally dropout, and fail to finish even the simplest of assignments. From 5 to 15% of secondary students could benefit from some form of curricular modification.

Curriculum compacting is one of the most common forms of curriculum modification for academically advanced students. It is also the basic procedure upon which many other types of modification are founded. Compacting is based on the premise that students who demonstrate they have mastered course content, or can master course content more quickly, can buy time to study material that they find more challenging and interesting (Renzulli & Reis, 1985).

Both basic skills and course content can be compacted. Although basic skills compacting is easier for teachers new to the process, the latter is probably more common in secondary schools. Basic skills compacting involves determining what basic skills students have mastered and eliminating the practice or repetition of those skills. For example, beginning chemistry students who have demonstrated mastery of the periodic table would have little need for further drill and practice in its use and would be better served by advancing to more complex course content.

Sometimes, academically advanced students may not have mastered course content, but they are capable of doing so at an accelerated pace. They may have some understanding of the content and may require minimal time or instruction for mastery. In these cases, content compacting is useful. Perhaps a sophomore class is reading *To Kill a Mockingbird* and reflecting on the societal ramifications of racial prejudice. Some students read at a much faster rate and are able to cover the novel more quickly than others or are able to demonstrate mastery of the objectives associated with the novel. A former student of mine relayed the following story about his sophomore experience with the novel.

Josh loved to read and was excited when his sophomore teacher distributed *To Kill a Mockingbird* on Friday afternoon. She assigned the first few chapters for weekend reading. Josh was scheduled to play a basketball game that evening and decided to start reading the book on the bus trip to the game. He became engrossed in the story and finished reading the novel that evening after returning from the trip. Monday morning he reported to his literature teacher that it was a great book.

"You didn't finish it already," she commented. After a short conversation, she was convinced he had.

"What are we reading next?" he asked. She gave him the next novel. He finished it in a couple of days and asked for the next one.

She hesitated, "I don't want you mixing up the stories when we discuss them in class, so I'm not going to give you the next one."

"Mr. Siegle, I'm not going to mix up *To Kill a Mockingbird* with —," he relayed. He enjoyed the class discussion and didn't want to miss it. He simply wanted to continue reading interesting literature. This young man would have been a good candidate for content compacting.

I once explained compacting to several junior high students who were part of a study being conducted by The National Research Center on the Gifted and Talented. One asked, "What is it again?"

I explained that their teacher was planning to test them on their school material and they would then not be required to do worksheets or workbook pages for the material they already knew. One young woman looked at me rather puzzled and said, "Well, that just makes sense." Curriculum compacting does "just make sense." Each year thousands of students coast academically as they repeat material that they

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already have mastered or which they could easily master in a fraction of the time.

Imagine that you've just finished vacuuming your home and your spouse arrives. After complimenting you on how nice the house looks, your spouse suggests that you vacuum it again. When you question your spouse, s/he responds that you might forget how to vacuum and you ought to practice. After you refuse, your spouse tells a friend that s/he can't understand why you didn't want to vacuum the house again. Your spouse notes that s/he knows that you know how to vacuum but can't understand why you "just won't do it." While this story may seem absurd, may of us have heard teaching colleagues complain about one of their students who knows how do a particular worksheet or homework assignment, but the student "just won't do it." Perhaps, like the vacuuming incident, if the student has demonstrated that he or she knows the material it doesn't need to be repeated again.

The compacting procedure is simple: Determine what the students already know and what they still need to learn, and replace it with more challenging material that they would like to learn (Starko, 1986). Generally, two basic principles are recommended when compacting. First, grades should be based on the material compacted (what the student has mastered), rather than the replacement material. Students may be reluctant to tackle more challenging material if they risk receiving lower grades that may reduce their chances for academic scholarships. This is not to say that replacement activities should not be evaluated. Second, replacement material should be based on student interests. Since replacement material will require greater student effort, the task commitment and responsibility necessary to work independently (which is often, but not always, the learning situation) mandate that the student have a vested interest in the content.

There are eight basic steps to curriculum compacting.

1. Determine the learning objectives for the material.
2. Find an appropriate way to assess those objectives.
3. Identify students who may have already mastered the objectives (or could master them more quickly).
4. Assess those students to determine their mastery level.
5. Streamline practice or instruction for students who demonstrate mastery of the objectives.
6. Provide small group or individual instruction for students who have not yet mastered all of the objectives, but are capable of doing so more quickly than their classmates.
7. Offer more challenging academic alternatives based on student interest.
8. Maintain a record of the compacting process and instructional options provided. (Reis, Burns, & Renzulli, 1992a)

Educators new to the process should consider the following recommendations:

- Start with one or two responsible students.
- Select content with which they feel comfortable.
- Try a variety of methods to determine student mastery of the material (a brief conversation with a student may be just as effective as a written pretest).
- Compact by topic rather than time.
- Define proficiency based on a consensus with administrators and parents.
- Don't be afraid to request help from available sources such as community volunteers. (Reis, Burns, & Renzulli, 1992b)

Curriculum compacting works best when adopted by a school district as a regular part of good teaching practices. When superintendents, principals, and other administrators support and encourage the process it is certainly much easier. All students, including those who are academically advanced, are entitled to an education inwhich instruction is geared to their needs, interests, and developmental levels.

Being a teacher is an awesome responsibility. It means being given charge of the nation's most valuable resource, the talent of its youth, and helping develop it. It means working with future O'Keeffes or Einsteins or Steinbecks at a time when they are most vulnerable, when they are learning about themselves and their talents. If those talents are not developed and recognized, the loss is not only to the nation, but to the individuals who, when not challenged, often fall into patterns of underachievement and boredom. By providing an appropriately modified and differentiated educational experience, such as curriculum compacting, the buds of youth do open into radiant blooms of productive and fulfilled adults.

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