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ABSTRACT

These two newsletters of The National Research Center on the Gifted and Talented (NRC/GT) present articles concerned with research on the education of gifted and talented students. The articles include: "NRC/GT: Making Decisions and Determining Next Steps" (E. Jean Gubbins); "Free Summer Programs for Talented Teens" (D. Betsy McCoach); "High End Learning in the Diverse Middle School: Investigating the Possibilities" (Catherine Brighton and Holly Hertberg); "Gender Issues in Gifted Education" (Lynn Rose); "NRC/GT through the Year 2000" (E. Jean Gubbins); "What's in a Word?" (Susan T. Dinnocenti); "Inventive Differentiation" (Julie Rossbach); "Mentorship at Its Best" (Nancy Lashaway-Bokina); "Extraordinary Gifts Often Come in Plain Brown Wrappers" (Fred A. Bonner, II); and "Curriculum Compacting: A Necessity for Academic Advancement." (Each article contains references.) (DB)

THE NATIONAL RESEARCH CENTER ON THE GIFTED AND TALENTED NEWSLETTER

1999 SPRING NEWSLETTER

&

1999 FALL NEWSLETTER

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

NRC/GT: Making Decisions and Determining Next Steps

E. Jean Gubbins
University of Connecticut
Storrs, Connecticut

The National Research Center on the Gifted and Talented (NRC/GT) started in 1990 through federal funding under the Jacob K. Javits Gifted and Talented Students Education Act of 1988. From 1990 to 1995, researchers from the University of Connecticut, University of Georgia, University of Virginia, and Yale University outlined a number of research studies responsive to this legislation. We investigated issues related to identification, programming, classroom practices, theories of intelligence, and evaluation. We looked in classrooms, studied past practices, evaluated service delivery models, and created programming options to meet the academic and affective needs of gifted and talented students. From the start, we wanted to be responsive to practitioners, researchers, and others interested in academic and affective needs of gifted and talented students. We created a national research needs assessment survey to determine our research priorities and to ensure that our studies would be relevant to school districts throughout the country. Results of our needs assessment survey provided information from individuals, groups, and states (Renzulli, Reid, & Gubbins, 1992). State directors of gifted and talented education played key roles in analyzing and interpreting state-level data. They convened meetings of practitioners, parents, researchers, and community members to examine findings, rank priorities, and propose possible research questions to guide decisions as to which questions would be most relevant. Results of state deliberations were then presented to our National Research Center Advisory Council who, at that time, comprised elected representatives from state departments of education and appointed members who could expand the views of researchers associated with the NRC/GT consortium of universities.

The needs assessment process allowed us an opportunity to look at multiple perspectives, conduct statistical analyses of research priorities, develop potential research questions, and create quantitative and qualitative research designs. A comprehensive overview of the process is described in *Setting An Agenda: Research Priorities for the Gifted and Talented Through the Year 2000* (Renzulli, Reid, & Gubbins, 1992).

Gathering national data on research priorities has served us well and will continue to do so through the year 2000. When we recompeted for The National Research Center on the Gifted and Talented in 1995, we reviewed the needs assessment data and studied priorities established by the United States Department of Education, Office of Educational Research and Improvement. Using suggested topics, the current consortium (University of Connecticut; City University of New York, City College; Stanford University, University of Virginia; and Yale University) designed theory-based studies that would lead to sound practices. These multi-year studies culminate in the year 2000, and we will disseminate findings to practitioners, parents, researchers, and policymakers.

Obviously, developing and implementing a national needs assessment is a complex process. We wanted data on possible lines of research; therefore, we asked respondents to determine the importance of topics such as:

- identification
- program organization
- curriculum development
- program evaluation

These topics are central to program development. They are listed as separate categories, but they are also interdependent.

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I N S I D E

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"Even if your programs and services for gifted and talented students are relatively new or firmly established, it is helpful to take another look at what you are doing and what is being accomplished."

These categories could serve as topics for your own district-level needs assessment. Even if your programs and services for gifted and talented students are relatively new or firmly established, it is helpful to take another look at what you are doing and what is being accomplished. How would you and your colleagues respond to the following questions?

Identification

- What are the characteristics of gifted and talented students?
- What are the academic needs of gifted and talented students?
- To what extent do current programs and services meet students' academic needs?
- What are the talents and abilities of our students in the arts?
- To what extent are we meeting the needs of students in the arts?

Program Organization

- What are the benefits of various organizational patterns (e.g., separate class, pullout program, within-class options, Saturday program, after-school program)?
- How comprehensive are available programs and services?
- Do the programs and services constitute a value-added approach to school effectiveness?
- How does the current organizational plan maximize the talents and abilities of students?

Curriculum Development

- What is challenge level of the regular curriculum?
- What curricular options are available to challenge students' talents and abilities?
- To what extent does the curriculum promote high-end learning for all students?
- How does the curriculum address complex concepts, principles, and generalizations?

Program Evaluation

- Do the programs and services produce desirable student outcomes?
- What is the long-term impact of programs and services?
- How do the accomplishments of gifted and talented students involved in available programs and services compare to those of gifted and talented students who do not have access to programs and services?
- To what extent do programs and services create a "radiation of excellence"? (Ward, 1981, p. 76)

You might pose these questions to small groups of teachers and administrators as a way of a checking the status of programming opportunities. If your district is considering new programs and services, these questions will guide your planning process.

Check our web site (www.gifted.uconn.edu) for abstracts and briefing sheets on The National Research Center on the Gifted and Talented studies to date. Several studies address the suggested questions above and provide research-based guidelines. Of course, we recognize the importance of connecting district needs, students' needs, and resources to create the best opportunities. Use comments and suggestions gathered through a needs assessment to make programmatic decisions and chart your next steps. Programs and services need to be studied periodically to ensure their relevance and effectiveness. Start asking questions, studying answers, and raising new questions. Teachers and administrators can provide an internal assessment of programming. Don't forget other constituents! Think about developing a set of relevant questions for students and parents. Do they understand the purposes of programming options? How do they view the outcomes?

How about asking program developers from other districts to review findings from your needs assessment? They may provide insights and critical information that will strengthen your programming opportunities. Just as we asked state directors to work with a select group of constituents to gain additional perspectives on needs assessment findings, you may find that involving others in data analyses will enhance your understanding and interpretation of program effectiveness.

References

Renzulli, J. S., Reid, B. D., & Gubbins, E. J. (1992). *Setting an agenda: Research priorities for the gifted and talented through the year 2000.* Storrs, CT: University of Connecticut, The National Research Center on the Gifted and Talented.

Ward, V. (1981). Basic concepts. In W. B. Barbe & J. S. Renzulli, *Psychology and education of the gifted* (3rd ed., pp. 66-76). New York: Irvington.

Free Summer Programs for Talented Teens

D. Betsy McCoach
University of Connecticut
Storrs, CT

Summer is an ideal time for talented teenagers to develop skills and interests as they begin to explore college and career options. Year-round learners can take advantage of a wide variety of free summer programs in various academic disciplines. The following list describes several national and regional residential summer academic programs available at no cost to qualified participants. Read the descriptions carefully; often the programs target a very specific audience.

Unfortunately, the application deadlines for many of these summer programs have already passed. These listings are included for parents, teachers, and students who may wish to begin planning for next summer. Because grants or donations fund most free programs, these offerings may vary from year to year.

This is only a sampling of free summer programs that exist for talented teenagers. Often, colleges and universities offer commuter programs for local students or special residential programs for state residents. For example, many states sponsor governor's schools for academically or artistically talented young people. You can find additional information about summer enrichment opportunities for adolescents on various worldwide web sites.

Auburn University Minority Introduction to Engineering Program (MITE)

Location: Auburn, AL
Dates: June 13-June 19, 1999 or
June 20-June 26, 1999 or
July 11-July17, 1999
Application Deadline: April 30, 1999
Contact: Dr. David A. Cicci, Director, MITE Program
211 Aerospace Engineering Building
Auburn University, AL 36849
Phone: (334) 844-6820
Fax: (334) 844-6803
E-mail: dcicci@eng.auburn.edu

Auburn University invites rising high school seniors from traditionally underrepresented ethnic groups to visit campus for 1 week. Students spend the week learning about engineering and computer programming, exploring engineering as a possible career option, and becoming acquainted with college campus life.

Clarkson University Math and Engineering Program

Location: Potsdam, NY
Dates: June 27-July 24, 1999
Application Deadline: February 28, 1999
Contact: Vicki Clark, Pipeline of Educational Programs Office
P. O. Box 5512
Potsdam, NY 13676
Phone: (315) 268-3785
Fax: (315) 268-7615
E-mail: vicki@clarkson.edu

This 4-week residential program for rising junior and senior Native American students includes instruction in mathematics, engineering, computer science, and entrepreneurship. Classes are held from 8:30-4:30. The program also includes a college career counseling component and culturally related activities. Applicants must have a strong math background.

EarthWatch Student Challenge Awards Program

Location: Varies throughout North America and Costa Rica
Dates: During the time period June 15-August 25, 1999
Application Deadline: Teachers must nominate students by November
Contact: Dee Robbins, Program Director, Student Challenge Awards Program
680 Mount Auburn Street
P. O. Box 9104
Watertown, MA 02472
Phone: (800) 776-0188 or (617) 926-8200, ext. 109
Internet: http://www.earthwatch.org/scdurfee.html

The Science Challenge Awards Program gives high school students talented in the arts and humanities an opportunity to work with actual field research scientists in one of a variety of research disciplines, from microbiology to astronomy. The 70 or 80 award recipients spend 2 to 3 weeks assisting the summer research activities of talented scientists throughout North America and Costa Rica. Successful applicants are creative non-conformers who exhibit strong communications and critical thinking skills. Research

"Summer is an ideal time for talented teenagers to develop skills and interests as they begin to explore college and career options."

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awards cover students' travel costs as well as their living expenses. To apply for the program, a student must be nominated by his or her school. Each school may nominate a maximum of two students. Students interested in applying for the program should ask a teacher or counselor to request further information and nomination forms from EarthWatch.

1999 Environmental Studies Workshop for Native American Students

Location: Lac Courte Oreilles, Bad River, Red Cliff, Oneida, Mole Lake and Menominee Reservations, and Madison, WI
Dates: August 1-13, 1999
Application Deadline: June 15, 1999
Contact: Barbara Borns
Institute for Environmental Studies
University of Wisconsin-Madison
550 North Park Street, 70 Science Hall
Madison, WI 53706
Phone: (608) 263-4373
Fax: (608) 262-2273
E-mail: blborns@facstaff.wisc.edu

This 2-week program is designed for Native American students (ages 13-17) who have an interest in environmental science. Each participant receives a full scholarship for meals, lodging, and transportation.

FAME / UNITE / MERIT / UD

Location: Newark, DE
Dates: June 20-July 24, 1999
Application Deadline: April 2, 1999
Contact: Michael L. Vaughn
University of Delaware
135 Du Pont Hall
Newark, DE 19716
Phone: (302) 831-6315
Fax: (302) 831-8179
Internet: http://www.udel.edu/provost/ugradcat/current/specprog/html#summercollege

The Forum to Advance Minorities (FAME) is a 5-week pre-college program for talented rising juniors and seniors from minority groups underrepresented in the fields of science and engineering. Talented minority high school students with demonstrated potential for success in applied science and mathematics areas have the opportunity to take coursework and develop skills in the areas of mathematics, chemistry, English, physics, and engineering design.

Indians into Medicine (INMED)

Location: Grand Forks, ND
Dates: June 7-July 16, 1999
Application Deadline: March 31, 1999
Contact: Inmed Program
501 North Columbia Road
Grand Forks, ND 58203
Phone: (701) 777-3037
Fax: (701) 777-3277
Internet: http://www.med.und.nodak.edu/depts/inmed/home.htm

Junior and senior high school Native American students may participate in an intensive 6-week enrichment course through the INMED Summer Institute. The INMED program helps students develop strong academic foundations vital to success in college health science courses. The program includes group and individualized instruction in mathematics, physics, chemistry, biology, and communications. Tours of Native American health facilities and daily laboratory sessions serve as practical teaching aids. The Institute also includes an overview of health career opportunities and helps students to develop study skills. Guest speakers include Indian health professionals and experts who represent a variety of health disciplines. The summer Institute experience includes field trips, recreation, and Indian awareness workshops.

Iowa State University of Science and Technology Internships

Location: Ames, IO
Dates: June 14-July 23, 1999
Application Deadline: January 31, 1999
Contact: Program for Women in Science and Engineering
210 Lab of Mechanics
Iowa State University
Ames, IA 50011
Phone: (515) 294-0966
E-mail: pwse@iastate.edu
Internet: http://www.public.iastate.edu/~pwse_info/

Iowa State University's (ISU) paid summer internship encourages talented high school girls to explore their interests in science and engineering. The internships provide opportunities for rising seniors to gain hands-on research experience. Interns work for a minimum of 6 weeks conducting research in a science or engineering research laboratory on the ISU campus. Faculty members guide their work in a friendly and intellectually challenging atmosphere. Every effort is made to select a research laboratory to match an intern's interests. Interns receive a $1,250 stipend for the 6-week session. Participants are responsible for their own

transportation, meals, and housing. Interns not living at home are required to live in an ISU residence hall.

Marie Walsh Sharpe Art Foundation Summer Seminar

Location: Colorado Springs, CO
Dates: Session I- June 20-July 3, 1999
Session II- July 4-July 17, 1999
Session III- July 18-July 31, 1999
Application Deadline: April 8, 1999
Contact: The Marie Walsh Sharpe Art Foundation
711 N. Tejon, Suite B
Colorado Springs, CO 80903
Phone: (719) 635-3220

The Marie Walsh Sharpe Art Foundation Summer Seminar is a scholarship program for artistically gifted high school juniors. The intensive 2-week visual arts studio program allows each student to gain a stronger foundation of skills and understanding in the visual arts by experiencing college level drawing and painting classes in a group studio setting. The primary instructors, artists in residence, vary from session to session. Applicants must submit slides of their artwork.

Minorities in Engineering Workshop

Location: Houghton, MI
Dates: June 20-June 26, 1999
Application Deadline: April 2, 1999
Contact: Youth Programs Office–Engineering Workshops
Michigan Technological University
1400 Townsend Drive
Houghton, MI 49931-1295
Phone: (906) 487-2219
Internet: http://www.yth.mtu.edu/syp

The Minorities in Engineering Workshop allows minority and/or economically disadvantaged rising high school juniors and seniors who are academically talented in mathematics and/or science the opportunity to investigate careers in engineering and science. Successful applicants should have a strong mathematics and science background and/or interest in technological studies. Minority engineers from business, government, and university positions provide informational sessions and discussions. Each session includes a laboratory experience and a team engineering project. There is a $50 registration fee.

Minority Introduction to Engineering, Entrepreneurship, and Science

Location: Cambridge, MA
Dates: June 21-July 30, 1999
Application Deadline: February 12, 1999
Contact: Karl W. Reid, Director, MITES Program
Room 1-211, 77 Massachusetts Avenue
Cambridge, MA 02139
Phone: (617) 253-3298
Fax: (617) 253-8549
E-mail: suzm@mit.edu
Internet: http://web.mit.edu/mites/www

MITES, a rigorous 6-week program for rising high school seniors, introduces underrepresented high school students to the fields of science and engineering. Students have the opportunity to study math, physics, chemistry, biochemistry, engineering design, entrepreneurship, and writing as they develop the skills to succeed in a competitive university environment. Field trips, career guidance presentations, and other cultural activities provide additional enrichment and career awareness opportunities.

Mississippi University for Women Pre-College Enrichment Program

Location: Columbus, MS
Dates: July 6-August 7, 1999
Application Deadline: Rolling admissions, preferably before May 15, 1999.
Contact: MUW- PEP
W- Box 1613
Columbus, MS 39701
Phone: (601) 329-7106

MUW offers 50 full scholarships to PEP, a summer program for rising high school seniors. MUW has been coed since 1982; therefore, both males and females are welcome to apply to the PEP program. Participants take up to 9 semester hours of academic credit, participate in a special colloquium, go on field trips, and experience campus life.

NASA Sharp Plus Program

Location: 12 universities throughout the country
Dates: June 14-August 6, 1999
Application Deadline: February 1, 1999
Contact: NASA Sharp Plus Program
1818 N. St., NW, Suite 350
Washington, DC 20036
Phone: (202) 659-1818
Fax: (202) 659-5408;
E-mail: sharpplus@qem.org

The NASA Summer High School Apprenticeship Program, Sharp Plus, is a research-based science mentorship program

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for students traditionally underrepresented in the fields of science and engineering. Sharp Plus brings together approximately 300 underrepresented high school students and active researchers in aerospace-related fields. During the 8-week summer program, rising juniors and seniors engage in "hands-on" research at industrial sites or research laboratories. Students submit written final reports on their research to NASA and participate in a community service-focused academic year project upon their return to school in the fall.

Regional Center for Mathematics and Science

Location: Green Bay, WI
Dates: June 20-July 31, 1999
Contact: Director, RCMS
University of Wisconsin-Green Bay
2420 Nicolet Drive, SS 1929
Green Bay, WI 54311-7001
Phone: (920) 465-2671
(800) 253-RCMS
Fax: (920) 465-2954
E-mail: RCMS@UWGB.edu
Internet: http://www.uwgb.edu/edu/~RCMS

The Regional Center for Mathematics and Science (RCMS) is a residential 6-week pre-college program for high school sophomores with an interest in the health sciences. Participants must be potential first generation college graduates from families whose household taxable income meets guidelines established by the federal government. In addition, they must be residents of Illinois, Indiana, Michigan, Minnesota, Ohio, or Wisconsin. RCMS combines classroom instruction, laboratory research, computer opportunities, field trips, college and career counseling, and mentoring to develop students' interests and skills in the health sciences (medicine, nursing, physical therapy, and medical research). Students receive a small weekly stipend for participating. Eligible students will have the option to attend the program for a second summer after their junior year.

The Research Science Institute

Location: Cambridge, MA
Dates: Late June-Early August, 1999
Application Deadline: February 1, 1999
Contact: Ms. Maite Ballestero, Director of Programs
Phone: (703) 448-9062
Fax: (703) 442-9513
E-mail: maite@cee.org
Internet: http://rsi.cee.org

The Research Science Institute (RSI) is an intensive 6-week summer session of lectures, research, and discussion for high school students especially gifted in science and mathematics. Students work under the supervision of leading faculty and graduate students at research institutions and corporations throughout metropolitan Boston. Fifty students come from the United States; as many as 20 come from overseas. Almost all RSI Scholars are between their junior and senior years of high school. Admission is extremely competitive. Selection is based on a combination of factors: a well-rounded extracurricular background, previous research experience, strong academic achievement, and promising PSAT scores.

The Society of Women Engineers and Hewlett Packard Company Science Fair Campership Program

Location: Huntsville, AL
Dates: Dates of space camp
Application Deadline: May 1, 1999
Contact: Denise Roberts
Hewlett Packard M/S 250
11413 Chinden Blvd.
Boise, ID 83704
Phone: (208) 396-3685
E-mail: Denise_Roberts@hp.com

The Society for Women Engineers Science Fair Campership Program offers an opportunity for young women from minority groups that are underrepresented in science and engineering fields to attend 1-week space camp in Huntsville, AL. The scholarship includes transportation to and from space camp, room, and meals. Applicants must be eighth through eleventh graders who participated in a school, local, regional, or state science fair competition during the school year.

Summer Science Institute

Location: Madison, WI
Dates: June 20-August 7, 1999
Contact: Dr. Robert Bohanan
Center for Biology Education, Room 1320
425 Henry Mall
Madison, WI 53706
Phone: (608) 265-2125
Fax: (608) 262-67548;
E-mail: rbohanan@facstaff.wisc.edu
Internet: http://www.wisc.edu/cbe/k12.html

Summer Science Institute is a 7-week residential program for minority high school sophomores and juniors who show an interest in scientific research. Students participate in group

research projects such as animal behavior, exercise physiology, genetics/biotechnology, human psychology, microbiology/plant pathology, and environmental sciences. In addition, the program seeks to enhance student reading, writing, math, and study skills in the context of scientific research. Priority is given to minority, or disadvantaged students, including students from rural Wisconsin who might not have access to similar programs. Select students are admitted for a second summer of intensive, advanced training that gives them the opportunity to conduct an in-depth project in a field of their interest.

Telluride Association Summer Program

Location: Varies by topic
Dates: June 27-August 7, 1999
Contact: Telluride Association
217 West Avenue
Ithaca, NY 14850
Phone: (607) 273-5011
Fax: (607) 272-2667
E-mail: telluride@cornell.edu
Internet: http://www.telluride.cornell.edu/contact.htm

Telluride Association Summer Program (TASP) is a 6-week educational experience for high school juniors. Telluride also offers one sophomore seminar. TASP student attendees participate in a seminar led by college and university members. Sessions are held at Cornell University, University of Michigan, Ann Arbor, and Indiana University. Telluride Association seeks students from diverse educational backgrounds who demonstrate intellectual curiosity and motivation, rather than prior knowledge of the seminar's subject matter. The seminars, centered on a topic of importance in the humanities, the social sciences, or public policy, are similar to upper-level college classes. The faculty members, who are selected from the country's best institutions, design programs in which students read texts carefully and critically, consider controversial ideas from many sides, and express and analyze ideas clearly in their discussions and writings. The TASP offers no grades or college credit. All TASP students are provided a full scholarship that covers room, board, tuition, and books. Students pay only the costs of transportation and incidental expenses (participants with demonstrated need may request financial aid to cover reasonable travel costs). It is the policy of Telluride that no student be barred from attending a TASP for financial reasons.

University of Iowa Life Sciences Program

Location: Iowa City, IA
Dates: June 6-June 26, 1999
Application Deadline: February 28, 1999
Contact: Dr. Joe Coulter, Provost's Office
224 Jessup Hall
Iowa City, IA 52242
Phone: (319) 335-3555

Rising tenth grade Native American students have the opportunity to learn about environmental, health, and life sciences. This intensive 3-week program includes lectures, labs, field trips, and computer/math classes. Participants receive one hour of university credit.

University of North Carolina Environmental Science Program

Location: Pembroke, NC
Dates: June 13-July 1, 1999
Application Deadline: February 28, 1999
Contact: Dr. Freda Porter-Locklear
P. O. Box 1359
Pembroke, NC 28372
Phone: (910) 521-0549

Rising ninth grade Native American students study geometry, environmental science, physics, and computer skills. In addition, students take field trips, listen to guest speakers, and participate in cultural activities. This 3-week residential program is sponsored by the American Indian Science and Engineering Society.

U. S. Coast Guard Academy Minority Introduction to Engineering

Location: New London, CT
Dates: June 27-July 3, 1999 or
July 5-July 10, 1999
Application Deadline: April 30, 1999
Contact: Director of Admissions
Coast Guard Academy
15 Mohegan Avenue
New London, CT 06320-4195
Phone: (800) 883-USCG

Minority high school juniors spend one week learning about engineering. MITE participants also participate in calisthenics, athletic activities, and a paper beam building competition. Applicants must be U. S. citizens of minority heritage who scored at least 50 on the math PSAT, 500 on the math SAT, or 21 on the math ACT.

Visit in Engineering Week

Location: University Park, PA
Dates: July 11-July 17, 1999 or

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July 18-July 24, 1999 or
August 1-August 7, 1999
Application Deadline: May 28, 1999
Contact: Sandra D. Johnsen, Director
Minority Engineering Program, PSU
241 Hammond Building
Pennsylvania State University
University Park, PA 16802
Phone: (814) 865-7138
Fax: (814) 863-7496
E-mail: view@engr.psu.edu
Internet: http://www.engr.psu.edu/mep

VIEW is a 1-week engineering program for rising juniors or seniors. This program is designed to foster interest in engineering among talented, underrepresented students of color. Students have opportunities to develop creative problem solving skills, leadership skills, and interpersonal skills as they learn about career opportunities within the field of engineering.

Women in Engineering Workshop
Location: Houghton, MI
Dates: June 27-July 3, 1999
Application Deadline: April 2, 1999
Contact: Youth Programs Office - Engineering Workshops
Michigan Technological University
1400 Townsend Drive
Houghton, MI 49931-1295
Phone: (906) 487-2219
Internet: http://www.yth.mtu.edu/syp

The Women in Engineering Workshop allows rising high school junior and senior women to investigate careers in engineering and science. Practicing women engineers from industrial, governmental, and educational agencies lead informational sessions and discussions. Students also complete laboratory experiences and a team engineering project. There is a $100 registration fee.

Notes:

1. The NRC/GT does not endorse any of these programs. Readers are cautioned to investigate programs more thoroughly before they enroll their children in any summer program.
2. The descriptions are paraphrased and/or condensed from promotional materials provided by the summer programs.

News Briefs

The Gifted Development Center at the University of Denver College of Education is sponsoring a national leadership conference for parents of the gifted. The conference will be held at the University of Denver, Driscoll Center from Friday, June 25 through Sunday, June 27. Mary Sheedy Kurcinka, author of *Raising Your Spirited Child*, is one of several featured speakers. For more information contact: The Gifted Development Center, phone: (303) 837-8378, fax: (303) 831-7465, website: www.gifteddevelopment.com, e-mail: gifted@gifteddevelopment.com.

The Many Faces of Giftedness by Alexinia Young Baldwin and Wilma Vialle has recently been released by Wadsworth. The authors explore how a child's intellectual potential can be "masked" by cultural background, handicaps, or other challenging conditions.

Teachers College Press has published *Multicultural Gifted Education* by Donna Y. Ford and J. John Harris III. The volume serves as a comprehensive and practical resource for raising the expectations and level of instruction for gifted minority students. The authors offer case studies of successful multicultural gifted education.

It's News To Me! is a new board game from Newsline Publications that challenges players to complete tasks that incorporate every aspect of the newspaper such as: the front page, the business section, community, national and international news, the editorials, and the comics. It invites players (grades 4 and up) to analyze the news and form their own opinions about it. This board game is a classroom-tested, teacher-approved educational program used in elementary, middle, and high schools. It reinforces skills necessary to locate and manage information, to make decisions, to solve problems, and to become more proficient readers. For further information contact:
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Pittsburgh, PA 15217
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High End Learning in the Diverse Middle School: Investigating the Possibilities

Catherine Brighton
Holly Hertberg
University of Virginia
Charlottesville, VA

Educators in American middle schools face a tremendous challenge: meeting the needs of all learners in increasingly diverse classrooms. The middle school movement advocates heterogeneous grouping of students to prevent early stigmatization and "labeling" of students. Further, middle school educators are acutely aware of the huge diversity of backgrounds, readiness levels, interests, learning profiles, and general development of students in the middle grades. Even homogeneously grouped middle school classrooms contain a tremendous diversity of student profiles. However, for a variety of reasons—including a lack of alternative images—teachers often "teach to the middle," leaving the special needs of students on both the low and high ends of the readiness spectrum unaddressed. Achieving middle school classrooms where all learners find both acceptance and genuine challenge requires a shift in how we conceive the roles of students and teachers. One thing is certain: traditional one-size-fits-all, teacher-centered classrooms, whether heterogeneously or homogeneously grouped, are not likely to be a good fit for academically diverse middle school populations. The challenge, then, for middle school educators teaching academically diverse populations is to ensure that the needs of all learners in their classrooms are equally valued and equitably served.

Overview of the Investigation

Researchers with The National Research Center for the Gifted and Talented (NRC/GT) at the University of Virginia site are investigating possible responses to this challenge. The NRC/GT is engaged in a study examining the feasibility of providing high level instruction for all students—including gifted, minority, and limited English proficiency students—within diverse classrooms. The 5-year study focuses on the impact of differentiating instruction and implementing authentic assessment strategies on middle school teachers, students, and schools. Researchers from the University of Virginia consistently visit nine schools in three states to help teachers and administrators incorporate differentiated instruction and authentic assessment strategies into their instructional practices and beliefs. Three of the target schools focus on differentiated instruction, three focus on authentic assessment strategies alone, and three serve as control sites that will receive staff development related to differentiation and authentic assessment strategies in the future. The various schools are aware of their status in the study.

The underlying philosophy of differentiated instruction and authentic assessment requires educators to recognize that learners differ and therefore need differing tasks and assessments presented in a variety of ways to maximize their potential. Translating this philosophy into classroom practice takes time, effort, and on-going support. Therefore, researchers assume a coaching role: observing teachers, providing feedback on an individual basis, assisting with instructional planning, providing concrete models of differentiated lessons, tasks, and rubrics, and generally supporting the change process. As much as possible, coaches try to model differentiation in the way they teach teachers to implement these new ideas.

Treatment Group One: Differentiation

In the first treatment group of three middle schools in three different states, the focus is on the implementation of differentiation of curriculum and instruction. That is, helping teachers learn to adjust the complexity of materials and tasks for learner interest, readiness, and mode of learning. For example, one coach recently worked with a seventh grade history teacher to plan a unit on the Industrial Revolution. Using units from previous years, the teacher and coach identified the major concepts underlying the unit and determined what the teacher wanted the students to know and be able to do as a result of studying the unit. The teacher and coach then developed pre-assessment tools to determine what individual students might already know, and began determining activities differentiated according to student interests, readiness levels, learning profiles, and prior knowledge.

"Achieving middle school classrooms where all learners find both acceptance and genuine challenge requires a shift in how we conceive the roles of students and teachers."

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From listening to teachers talk about their experiences with differentiation, researchers can understand how teachers try to incorporate principles of differentiation into the realities of their day-to-day practice. Teachers generally agree with the rationale of differentiated instruction, and recognize a need to adjust their teaching strategies to more efficiently meet the needs of diverse learners. However, translating theory into specific classroom practice often presents formidable obstacles for teachers.

The NRC/GT coaches work with each teacher individually or with grade level teams to assist in bridging the gap between theory and application. While coaching sessions vary according to teacher or team needs, the basic purpose of these meetings is to assist teachers in the development of differentiated curriculum readily useful in their classrooms to meet the needs of a wide range of learners. A typical planning session might include some of the following:

- Reviewing state and local standards to ensure clarity about learning goals.
- Melding requirements with overarching concepts to provide a framework of meaning for the upcoming unit or lesson.
- Creating (or assembling) appropriate pre-assessment tools to determine students' understanding of a unit of study prior to beginning the teaching of the unit.
- Reviewing student data gathered from pre-assessment tools.
- Determining objectives for the unit of study, including the specific content objectives and skills to be mastered by various groups based on the students' learning profiles.
- Determining appropriate instructional model(s) to be used during the unit.
- Discussing classroom management strategies that make differentiated instruction possible and efficient.
- Creating varied sense-making activities using instructional strategies such as tiered assignments, contracts, and independent studies.
- Creating appropriate assessments that determine what the students know, understand, and are able to do as a result of the completion of the unit.

Notes from coaching sessions provide one part of the data collection at the differentiation sites. Additionally, researchers interview and survey students to understand their perceptions of school, teachers, and learning. Teachers are also formally observed and interviewed about the change process, their feelings about differentiated instruction as a vehicle to meet varied learners' needs, and the challenges they face. Blending insights from a range of data sources allows researchers to develop an evolving understanding of how teachers learn about and apply principles of differentiated instruction. In turn, these understandings shape plans for coaching and staff development sessions that follow in the process.

Treatment Group Two: Authentic Assessment

In the differentiation sites, the primary emphasis is on a "front door" approach to guiding instruction for the academically diverse learners, as practices of instructional modifications are approached and coached directly. In the second treatment group, focusing on authentic assessment, the emphasis is on guiding teachers to evaluate student understanding using tiered prompts and graduated rubrics. Tiered prompts are a continuum of performance tasks aimed at the different levels of student readiness or learning profiles represented in the classroom. Tasks vary from concrete and structured to abstract and open-ended. The number of tasks created may differ in each classroom, but generally have two or three tiered options. After the tiered prompts are completed, teachers evaluate the tasks using graduated rubrics. Skills and concepts are shown on a continuum from novice to expert, with criteria for each level specifically delineated. Students examine the criteria for mastery prior to beginning the tasks so there are no surprises about expectations for mastery or quality. In this way, teachers are exploring varied student needs through a "back door" approach. That is, they come to understand how students demonstrate knowledge and skill at various levels of complexity and through different modes. The hope is that such teacher awareness may then prompt them to modify the next cycle of instruction in response to learner needs. Coaches from the University of Virginia work collaboratively with teachers at these assessment sites to extend assessment beyond pencil and paper tests and quizzes. This alternative approach to assessment assumes a broader view of how student understanding can be demonstrated, including performances and products. Prior to a coaching session, the teacher determines the unit's objectives based in part on national, state, and local standards. He or she also selects the appropriate instructional path to accomplish the unit objectives. Depending upon the needs of the individual or team of teachers, some of the following might take place during assessment coaching sessions:

- Determining the best method of assessing a student's understanding of the content taught and ability to apply new skills.

- Creating tiered assessment tasks that reflect "real world" applicability of key skills and understandings.
- Probing teachers about how the tasks can be differentiated to meet the varied needs of learners in the class.
- Creating graduated rubrics that reflect the proficiency level of students in each domain. These domains are determined from the unit objectives and should be determined in advance.
- Analyzing data collected from previous student performances and products to use in guiding future instruction.

Teacher interviews and observations are also conducted at the authentic assessment sites to understand how teachers shift their thinking about assessment as a way to meet the needs of diverse learners. Additionally, researchers examine whether teacher recognition of student differences in assessing students translates into recognizing student differences in planning instruction for them.

Conclusions

Based upon the findings of the NRC/GT study, we can determine which approach—the "front door" or the "back door"—is most effective in leading teachers to create differentiated middle school classrooms. To move toward widespread implementation of differentiated instruction and authentic assessment in our schools, we must examine the most effective methods of training teachers to utilize these strategies. In the process of determining these methods, we come to understand the challenges of change for teachers, and the level of support that an educational community must provide for teachers as they progress on their journeys toward responsive classrooms.

As our conversations with teachers and students continue to provide new information and insight into the process of integrating differentiated instruction and authentic assessment into school beliefs and practices, new questions emerge. Currently, we are pursuing questions such as:

- What are the stages through which teachers progress in learning to differentiate instruction and use authentic assessment?
- How do teachers assess student needs and address them within their classrooms?
- What sort of support—both within the school and outside of it—is most useful in aiding teachers to change their practices?
- How do teachers merge the beliefs and practices accompanying differentiated instruction and authentic assessment with their existing philosophies of education?

Meeting the needs of diverse learners goes beyond simply providing student choice or giving two versions of the same test or using a particular instructional strategy. It requires a fundamental shift in teachers' understandings of the roles and responsibilities of teachers and students. Fundamental changes cannot happen overnight and require "buy in" not only from teachers, but from administrators and parents as well. We hope that the NRC/GT study will provide insight into what specifically we can do to develop learning communities that foster and support the maximization of all students' potential.

The National Research Center on the Gifted and Talented is pleased to welcome the following Collaborative School Districts:

Mendota Community Consolidated District #289
Mendota, IL

Ludlow Independent Schools
Ludlow, KY

Reading Public Schools
Reading, MA

If you are interested in joining our Collaborative School District bank, contact us at the address listed on page 16.

"Some studies have shown that differential treatment of males and females begins at an early age, starting with parents."

Gender Issues in Gifted Education

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If we examined a high school calculus classroom or the faculty of an engineering program at a university, chances are that the male to female ratio would be significantly skewed. Although there has been no evidence thus far stating that males naturally have a better capacity for understanding math and science, females, even those considered gifted, have tended to shy away from these disciplines. In 1990, the National Science Foundation reported that only 9% of Ph.D. physical scientists and 4% of all engineers are female (Davis & Rimm, 1998). Although one would assume that academically gifted students may excel in the logical and analytical skills required for math and science, gifted females still, on average, tend to feel more uncomfortable with these subjects than their male counterparts. What causes this phenomenon? Do parents, teachers, or peers cause, or at least contribute, to this situation? When do these feelings of inability begin to manifest themselves? Do gifted females' perceptions of their abilities develop as a result of educational socialization?

There has been a great deal of research conducted on gender differences and stereotypes of both regular and gifted students. A study by Benbow (1992) reported that fewer females are labeled as mathematically gifted than males. The study also stated that females labeled as gifted are less likely to take demanding high school math and science courses, major in math or science in college (40% vs. 72%), or pursue a career in a math or science-related field (24% vs. 56%).

Some studies have shown that differential treatment of males and females begins at an early age, starting with parents. Astin, Suniewick, and Dweck (1974) discovered that parents of female children generally do not buy as many mathematics-related toys and games as do parents of males, thus putting their female children at a distinct disadvantage when they enter the classroom. Other studies found that parents of female children are more likely to downplay the importance of mathematics (Parsons, Adler, & Kaczala, 1982). Jacobs and Weisz's (1994) study of sixth to eleventh grade students and their parents portrays an alarming finding: Females hold more negative beliefs about their abilities in mathematics even when they earn consistently higher grades than males. Jacobs points to the possibility that parents can influence their children's perceptions of ability.

Teachers, too, have been found to give differential treatment to males and females. Gifted females are less often encouraged to pursue the study of math and science subjects than males. Some teachers believe that girls tend to be more successful in language arts and that achievement in math and science is reserved for boys (Chauvin & Karnes, 1984). This is not to say that all teachers are biased in their opinions of their students' achievement. There are many educators, male and female, who successfully cultivate high self-esteem and achievement with their students, some specifically with their female pupils.

For whatever reason, gifted females may hold poor perceptions of their mathematics and science abilities. Perceptions are a learned trait. One study capitalized on this assumption and attempted to help gifted females "unlearn" those potentially detrimental attitudes that they possessed and develop a more realistic and healthy outlook of themselves and their abilities. This study, conducted by Heller and Ziegler in 1996, assumed that a person's achievement stemmed from two variables, locus of control (either external or internal) and stability (either stable or variable). An external factor is one that a subject is unable to control, such as task difficulty or chance, and an internal factor is one that is able to be controlled by the subject, such as ability or effort. Stability was measured as the consistency of a characteristic over time. Ability and task difficulty were seen as stable, effort and chance were considered variable.

Heller and Ziegler stated that "people formulate specific hypotheses concerning how and why events occurred" (p. 204). Heller and Ziegler quoted Bandura's belief that for the most positive of situations to occur, success must be attributed to ability, and failure to chance or lack of effort, therefore causing a higher degree of self-efficacy. High school and college females received "attributional retraining" to improve their self-concepts. The training was considered successful although it did have some limitations. However, it made an important point—learned behaviors of this type

are not irreversible. Females can be encouraged to confront their insecurities and change them for the better.

Research has found that gender differences between gifted males and females become quite evident by adolescence. Kerr (1985) outlined a number of distressing findings from past studies of gifted adolescent females:

- Gifted girls' IQ scores dropped in adolescence, perhaps as they began to perceive their own giftedness as undesirable.
- Highly gifted girls often do not receive recognition for their achievements.
- Highly gifted girls attended less prestigious colleges than did highly gifted boys, and this fact seemed to lead to lower status careers. (p. 103)

Noble and Drummond (1992) wrote an article entitled "But What About the Prom? Students' Perceptions of Early College Entrance" addressing gifted students who elected to participate in the University of Washington's Early Entrance Program (EEP). Program participants skip middle and/or high school and take courses at the university level. All females in the study were happy with their choice of EEP over high school, but many said that their parents were wary about their daughters missing out on traditional high school social activities. Some EEP students mentioned they regretted not having an opportunity to participate in such social activities, but believed that membership in the EEP program far outweighed attendance at high school sporting events, parties, and dances. "I'm terribly upset to have missed my prom, football games, cheerleading, and keg parties (ha ha, very funny)" (p. 109). Noble and Drummond believe that "high school may be widely perceived as a necessary and normalizing experience on the road to responsible, successful adulthood, but it is not the path that works for all gifted students" (p. 111).

I wanted to know if there were gender differences among high ability, high school science students. I designed a 13-item questionnaire about their academic backgrounds, strengths, weaknesses, and perceptions of themselves and their high-achieving peers. Two high-ability chemistry classes responded to the questionnaire. The first class was comprised of seven students—three females and four males. All students were required to take chemistry in order to graduate. The second class, an elective chemistry class, included four students—two males and two females. All students participated in gifted or accelerated programs. Interestingly enough, all participants were White in a school population in which 40% were Hispanic and 5% were African-American.

Ideally, it would have been much more revealing to have had a larger and more academically diverse group, but student responses were interesting nonetheless. Most students were heavily involved in school sports and activities and the remaining students had avenues outside school to exercise their talents and interests. All students in the elective chemistry class either liked or considered themselves strong in science, and two specifically stated that they also liked or were strong in math. One has to keep in mind that this second class is an elective science course and students feel somewhat confident about science abilities. One female stated that she is only strong in sciences, with particular interest in marine or equine science. She did not feel as strong in biology or other areas of science in which she did not hold a strong interest. Both males disliked or felt they were weak in English. The two females did not comment on their abilities in English.

When students in the general chemistry class were asked to comment on their strengths and weaknesses, males commented more often on their strengths and females commented more often on their weaknesses. According to the students, males were not necessarily strong in math and science and females were not always strong in English and social sciences. Only three males and one female considered themselves strong in science. The female commented, "I consider myself strong in science, and also enjoy it, but dislike math (and am weak in it), which is sometimes conflicting since math and science often go together (like chemistry)." Two females and one male categorized themselves as weak in chemistry and physics for the very same reason. Mathematics required for both disciplines adversely affected their ability to perform at a satisfactory level. Both believed themselves to be stronger in biology because there was less math involved. More males than females felt they were strong in math (3 vs. 1) and two females and one male felt they were weak in math. Students were asked if they attributed grades in science and math to effort or ability. Three females and one male attributed grades in math and science to effort. One male and one female felt ability played the largest role, and three males and one female believed that both effort and ability played roles in grades earned. Interestingly enough, those who answered "both" believed that a person must first have a natural talent, and when the student combines talent with hard work, good grades will follow. One male said,

> *First of all, the student needs to understand what is being taught, and then do the work to obtain a good grade. If a student did the work but did not fully*

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understand how a thing is done, that student would hurt on tests and the like.

Students' responses mildly support findings that females are more likely to attribute their grades to effort, while males are more likely to attribute them to ability.

All students believed that it is important to work with other students of similar academic abilities and interests. One female mentioned the benefit of meeting "other students with different interests" when not working with other high ability students. A second female commented that sometimes when working with other high-ability students, "you can't focus on your own ideas all the time."

When asked how high school impacts talented students, four males and two females answered that high school has a generally positive impact, two females and one male answered negatively, and one male commented that only small classes that do not "restrict the development of students" are more beneficial in that they allow for more "attention and individual advancement" than larger classes.

When asked if they had ever felt inclined to hide or downplay their academic talents, three females and three males answered "yes." One female and three males answered "no." One female replied, "It's tempting, because then people will expect less of you, but I think that it is something to be proud of, not something to hide."

All but one student believe that their parents support and encourage their academic talents. Some typical responses were:

My parents try to push me into doing better in school, but they know it's my decision and they let me make my own mistakes because they know I can handle the consequence.

Yes, my parents have high expectations and I believe I can reach them.

Yes, they expect me to do my best, but that doesn't mean that they expect A's all of the time. They are good about supporting me.

Answers were varied when asked if and how teachers play a role in student achievement. Most felt that teachers are somewhat helpful and encouraging, but often do not devote much time to individual students. Some typical responses were:

Not personally me, but they encourage everyone. No teacher has ever come up to me individually telling me to work harder.

Yes, but only some have really taken the time to get to know me.

Yes, specifically one teacher encouraged me to continue and experiment in the CT Science Fair. The science fair had been a great experience and really helped me realize what I want to do as a career.

All of the students questioned have plans to attend college, but only three were specific in what they planned to do. The three students (two males, one female) plan to enter either scientific or mathematical fields of study.

In summary, student responses revealed slight differences between talented males and females in areas of math and science. However, only a few students were asked to complete a series of questions. School systems should be aware of such gender issues and make efforts to alleviate potential gender differences through special programs or classes that encourage and foster students' talent. Perhaps by taking those actions, a future student pursuing a degree in education like myself has the opportunity to develop a similar questionnaire for part of a class assignment that will find different, gender-neutral information.

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NRC/GT: Providing Multiple Options for Disseminating Research Related to Gifted and Talented Education

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When I was a gifted and talented teacher in Iowa, I was frequently looking for research that would help me justify service and program options for students. Fortunately, I stumbled upon the resources from The National Research Center on the Gifted and Talented (NRC/GT). If I needed information on acceleration, grouping practices, or a summary of good programming options, the reports from the NRC/GT provided research-based recommendations that addressed both the needs of gifted and talented students and programming options.

More importantly they provided me with summaries and fact sheets that were easy to share with colleagues, administrators, teachers, and parents. Practitioner guides were invaluable in helping me disseminate information about curriculum compacting, creativity, mentors, gifted students and cooperative learning, and ability grouping.

Since NRC/GT print materials are not copyrighted, it was easy for me to disseminate materials to any audience. I kept NRC/GT print materials close at hand and could copy them at a moment's notice. I hope that when you need information you remember that materials from the NRC/GT combine research with practical application. Don't miss any opportunity to take advantage of NRC/GT materials.

A few of the newer NRC/GT materials include *Project Start: Using a Multiple Intelligence Model in Identifying and Promoting Talent in High-Risk Students* and the following Practitioner's Guides: *What Educator's Need to Know About Bilingual Children, What Parents and Communities Need to Know About Bilingual Children*, and three separate age-level brochures on *What Parents Need to Know About Recognizing and Encouraging Interests, Strengths, and Talents.*

Did You Know? A Fact List About NRC/GT (1990-2000)

- The NRC/GT is made up of five universities—University of Connecticut, University of Virginia, Yale University, Stanford University, and City University of New York, City College. (University of Connecticut, University of Virginia, Yale University, and University of Georgia participated from 1990-1995).
- Practitioner guides are colorful tri-fold brochures that highlight practical research.
- Several practitioner guides are available in both English and Spanish.
- NRC/GT products are sold on a cost-recovery basis and can be purchased for as little as $.50 for a single practitioner guide; monographs range from $5.00-$20.00 with many at the $10.00 level.
- You can print abstracts of NRC/GT research monographs from the web site at www.gifted.uconn.edu.
- Over a dozen gifted related web sites are linked from www.gifted.uconn.edu. Over 120 web sites link to www.gifted.uconn.edu.
- Counseling, parenting, preparing for college, and mathematics education are a few of the topics featured in NRC/GT publications.
- Monographs include executive summaries that highlight major findings.
- *Curricular Options for "High-End" Learning* (videotape and reproducible handout packet) includes great teaching ideas for different content areas and a summary of curriculum compacting.
- Staff associated with the NRC/GT have made 1,481 presentations as of March 1999.
- You can find articles on cluster grouping, the Schoolwide Enrichment Model, and other gifted related articles on our website.
- The NRC/GT includes 366 Collaborative School Districts in 52 states and Guam, Virgin Islands, and Columbia.
- Thus far, the NRC/GT has been mentioned in the press 506 times with a total circulation rate of 77 million.
- NRC/GT publications are the result of a collaborative effort of dozens of researchers, hundreds of teachers, and thousands of students from around the country, Guam, Virgin Islands, and Columbia.
- NRC/GT has generated 470 articles/books papers since 1990.
- There are five video training tapes that illustrate research studies. Each tape includes a reproducible handout packet or a facilitator's guide.

Newsletter Staff

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If articles in this newsletter are reprinted in other publications, please forward a copy of the publication to the address below.

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

NRC/GT Through the Year 2000

E. Jean Gubbins
University of Connecticut
Storrs, Connecticut

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.

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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INSIDE

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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 and impacts 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.

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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:

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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 in which 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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