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

NRC/GT: Making Decisions and Determining Next Steps

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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, IA
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:
Barbara S. Goldman
Newsline Publication, Inc.
P.O. Box 8114
Pittsburgh, PA 15217
Phone/Fax: (412)781-0595

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*

(continued on page 14)

(continued from page 13)

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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