NRC G/T

The National Research Center on the Gifted and Talented

The University of Connecticut
The University of Georgia
The University of Virginia
Yale University

Inside

Newsletter
Spring 1994

Improving the Learner/Teacher/Curriculum Connection

E. Jean Gubbins
The University of Connecticut
Storrs, CT

Several research studies conducted by The National Research Center on the Gifted and Talented have assessed the current status of classroom strategies and practices. Other studies have included an intervention. The Curriculum Compacting Study used a specific approach to modifying students' learning agendas by eliminating or streamlining what is known or what could easily be mastered in a limited amount of time (see Reis et al., 1993). The results of this study provided substantive data on the effectiveness of various approaches to teacher training. It also documented the student learning outcomes after a considerable amount of mastered content was eliminated. If you wish to become familiar with the technical aspects of the study, you can consult the research monograph: *Why Not Let High Ability Students Start School in January? The Results of the Curriculum Compacting Study* (Reis et al., 1993). You could also choose to watch the videotape, *Curriculum Compacting*, summarizing the data (Reis, Burns, & Renzulli, 1992). Or if you just wanted a brief overview of curriculum compacting, you could read our Practitioners' Guide on the same topic (Siegle, 1993).

Our research results are provided in multiple formats for multiple audiences. You choose the level of involvement with the research data, depending on your current needs and interests. We hope the multiple formats will ensure that audiences make the decision to wade through complex tables and charts, witness the process on film, or skim a brief document. There are multiple documents or sources of information about the Curriculum Compacting Study, but other studies incorporating an intervention are in various stages of completion; therefore, details are limited. Brief abstracts of three intervention studies follow:

Preservice Teacher Preparation in Meeting the Needs of Diverse Learners

Carol A. Tomlinson
Carolyn M. Callahan
The University of Virginia

The impact of direct instruction regarding the needs of diverse learners, including high ability students, has been assessed. Preservice teachers have become familiar with strategies of curriculum differentiation to meet students' academic needs. Some of these same teachers have worked with a peer coach to further their experiences with these strategies. In addition, a small sample of preservice teachers will be followed in their first teaching job to determine the longevity of the interventions (Tomlinson & Callahan, 1992).

The Theory-Based Approach to Identification, Teaching, and Evaluation of the Gifted

Robert J. Sternberg
Yale University

The research study identified high school students who were high in analytic, creative, or practical intelligences and involved them in a course in introductory psychology. The study "systematically manipulated identification, instruction, and evaluation of gifted students to determine what would be gained by broadening identification procedures, teaching in ways that are or are not

(continued on page 2)

(continued from page 1)

tailored to gifted students' particular patterns of abilities, and assessing the students' performance in ways that either do or do not address their particular strengths" (Sternberg & Clinkenbeard, 1993, p. 4).

The Longitudinal Study of Successful Classroom Practices

Francis X. Archambault, Jr.
Karen L. Westberg
The University of Connecticut

The Longitudinal Study of Successful Classroom Practices examines the impact of a program to develop higher level thinking skills among fourth and fifth grade students. Students were involved in the direct instruction of thinking skills at a basic task level related to several content areas: mathematics, science, and social studies. Students were introduced to thinking skills at a complex task level. One group of students used an inductive, technology-embedded approach; another group worked with hands-on simulations. Next year, students will have opportunities to apply thinking skills to advanced research projects, with or without the aid of technology.

These studies and others created experimental treatments that may lead to effective classroom strategies and practices; we will keep you posted! While the results are still unfolding, we wanted to capitalize on the professional experiences of our staff. Therefore, we have developed other resources to help you wend your way through an analysis of promising classroom strategies and practices that may improve the learner/teacher/curriculum connection. The following is a working definition of strategies and practices:

- coordinated series or group of specific activities
- carried out by teachers, students, administrators, or parents
- designed to reach designated goals/objectives
- developed from educational research and practice
- field-tested with students

Our satellite teleconference on May 11, 1994 featured a program entitled *Curricular Options for "High-End Learning."* The resulting videotape and handbook illustrate how to create curricular options for students that are responsive to their known and emerging talents. Four learning events are featured in mathematics, science, social studies, and enrichment clusters. The goal of the learning events is to engage students with the content to such an extent that they achieve a deep understanding. Gardner (1991) states this goal another way in his book, *Unschooled Mind: How Children Think & How Schools Should Teach. Most important from my vantage point are students who possess genuine understanding of the major disciplines and areas of knowledge. (p. 186)*

We designed lessons that would encourage a genuine understanding of the concepts. We also wanted to ensure that the lessons were well within your current instructional repertoire. This was done purposefully. We wanted to start with familiar material that would incorporate Strategies of Curriculum Differentiation (see Chart 1) to achieve high-end learning (Gubbins, 1994).

The phrase "high-end learning" may not be as familiar as curriculum differentiation. It was coined recently by Joseph Renzulli of The University of Connecticut (1994). The phrase goes beyond a list of strategies, and it is truly a philosophical and an educational stance. Our goal for students is to meet and challenge their highest levels of learning potentials. High-end learning does, indeed, incorporate strategies of differentiation. It also promotes a larger vision of developing the talents and abilities of all students.

We have captured various approaches to high-end learning in several content areas for our videotape and accompanying handbook: *Curricular Options for High-End Learning* (Gavin et al., 1994). Two of the four learning events will be described briefly: mathematics and social studies. A sample of the objectives and a list of promising strategies and practices will be provided.

Several years ago the mathematics standards were released by the National Council of Teachers of Mathematics (1989). The application of these standards will transform the classrooms into "... mathematical communities where students can explore together, wonder aloud, and communicate mathematically" (Gavin, 1994, p. 5). For the videotape on *Curricular Options for High-End Learning*, Gavin created a learning event based on a familiar activity using Cuisenaire rods. The standard of interest was mathematics as communication. The instructional objectives in "Mathematical Communication: Build What I've Created" included:

1. The teacher works with a peer coach and views a videotape of a model lesson. The teacher and peer coach adapt the lesson to the current academic needs of the students.
2. Students reconstruct a hidden structure with a given number of Cuisenaire rods in response to verbal cues.
3. Students use critical thinking skills to analyze the similarities and differences between the original structure and the recreated structure.
4. Students assess their accomplishments by photographing the most complex duplication and scripting the directions that were used to build their structure. Documentation is placed in their math portfolio.

Chart 1
Strategies of Curriculum Differentiation

Content

1. Present content that is related to broad-based issues, problems, or themes.
2. Integrate multiple disciplines into an area of study.
3. Present comprehensive, reinforcing, related experiences within an area of study.
4. Delete curriculum that has already been mastered.
5. Streamline curriculum that can be mastered quickly.
6. Organize content to accentuate higher level skills and concepts.
7. Select representative topics that illustrate the basic principles, functional concepts, and methodologies of the field.

Process

1. Encourage the in-depth learning of a self-selected topic.
2. Emphasize independent or self-directed study skills.
3. Encourage the application of advanced research and methodological skills.
4. Focus on open-ended tasks.
5. Promote productive, complex, abstract, and higher level thinking skills.

Product

1. Encourage the development of products that challenge existing ideas and produce new ones.
2. Encourage the application of the methodologies of the discipline in product development.
3. Evaluate student outcomes by using appropriate and specific criteria through self-appraisal, criterion referenced, and standardized instruments.
4. Promote the creation of products that focus on real-world problems presented to appropriate audiences.

Learning Environment

1. Encourage the development of self-understanding (e.g., recognizing and using one's abilities, becoming self-directed, appreciating likenesses and differences between oneself and others).
2. Encourage self-directed learning to promote the development of independent research studies.
3. Encourage the development of a positive attitude toward creative challenges, investigative activity, and knowledge creation.

Adapted from Passow (1982), Renzulli (1988), and VanTassel-Baska (1989)

The classroom strategies and practices for teachers that promoted engagement in learning were:

- Reflecting on your own instructional techniques through videotaping and then selecting the elements that prompted understanding of the lesson objectives. Sharing videotape results with another teacher during a peer coaching session.
- Using spatial visualization, verbal cues, and written communication to foster a working knowledge of geometric and directional terms.
- Incorporating an assessment technique within the lesson to confirm students' knowledge of the concepts.
- Promoting productive, complex, and abstract higher level thinking skills.

Another learning event on the videotape was: "Creating a Product and Reporting the Findings." This social studies lesson revolved around the development of artifacts or clues for the Artifact Box Exchange Network (Johnson & Reid, no date). The Artifact Box is an interschool project that involves students in advanced research, reference, and reasoning skills through a simulation. Schuler (1994) shared her experience with creating an Artifact Box with a classroom teacher. She worked cooperatively with the teacher as students designed products in multiple formats to represent the life accomplishments of an historical figure. The instructional objectives included:

1. Students read and analyze the writings of the historical figure and design products that will capture the essence of his life.
2. Teacher and students engage in a simulation of a significant event in the life of the historical figure.
3. Students create high quality product forms based on a set of standards and communicate findings to specific audiences.
4. Students participate in the assessment of their learning processes and products.

The students chose Mark Twain as a clue for their Artifact Box and formed interest-based, product development groups. They examined Twain's writings and the writings of others to determine three significant challenges he faced in life. The challenges were the bases for products, including a timeline, videotaped mock interview, a political cartoon, and an advertisement. Each product was evaluated using criteria developed by Samara and Curry (1990). The product critique for the mock interview included:

- explains reasons for interview; describes expertise of person being interviewed
- establishes rapport with interviewee; elicits positive, pertinent information
- asks open-ended questions; asks focus questions
- summarizes key points with questions or statements (cited in Schuler, 1994)

Artifacts representing a challenge faced by Mark Twain were prepared for the Artifact Box. The box will then be exchanged with another school. The task for the receiving school will be to analyze the clues and determine the location, the personality, and the time period for the historical figure. The students who created the clues were involved in problem-based learning through the following steps:

- Stating a challenge and developing a plan.
- Gathering information and organizing information.
- Creating a product and reporting the findings. (Schuler, 1994, p. 18)

(continued on page 4)

(continued from page 3)

Several strategies and practices were part of the lesson on "Creating a Product and Reporting the Findings." The lesson was one snapshot of a series of lessons that used the following strategies and practices:

- Using multiple instructional techniques to capitalize on students' learning styles.
- Encouraging the application of advanced research and methodological skills.
- Evaluating student outcomes by using appropriate and specific criteria through self-appraisal, criterion referenced, and standardized instruments.
- Providing students with examples of high quality products completed by other students as illustrations of the performance standards.

These lessons in mathematics and social studies were highlighted as examples of approaches to high-end learning. They incorporated strategies of curriculum differentiation, as well as the goal of developing the emerging and known talents of students. The lessons truly "enriched the tapestry of the curriculum" (Parham, personal communication, 1980) by capturing the interest and involvement of students and teachers.

If you are interested in implementing some of the strategies and practices from our intervention studies and videotape, you might have to make some changes in your curricular offerings or instructional styles. Change is not an easy process, but it is needed if we are to escalate the learning opportunities for students. It may be wise to reflect on some lessons in change offered by Fullan (1993):

1. You can't mandate what matters.
2. Change is a journey not a blueprint.
3. Connection with the wider environment is critical for success. (pp. 21-22)

Change is often thought of as a series of steps leading to a well-defined goal. Fullan thoroughly analyzes change and uncovers the forces that hamper the process. It is clear from his work and ours that a vision for schools has to be agreed upon before any change process is initiated. Our vision for schools is that we need to improve the learner/teacher/curriculum connection and promote the emerging and known talents of all students. Achieving this vision means that we need to keep you apprised of promising strategies and practices and share the research-based results as they become available.

References

Fullan, M. (1993). *Change forces: Probing the depths of educational reform.* London: The Falmer Press.

Gardner, H. (1991). *The unschooled mind: How children think & how schools should teach.* New York: Basic Books.

Gavin, M. K., Gubbins, E. J., Guenther, D. R., Neu, T. W., Reis, S. M., Robinson, G. J., Siegle, D., Schuler, P. A., & Vahidi, S. (1994). *Curricular options for high-end learning (videotape and handbook).* Storrs, CT: The National Research Center on the Gifted and Talented.

Gavin, M. K. (1994). Mathematical communication: Build what I've created. In M. K. Gavin, E. J. Gubbins, D. R. Guenther, T. W. Neu, S. M. Reis, G. J. Robinson, D. Siegle, P. A. Schuler, & S. Vahidi, *Curricular options for high-end learning* (pp. 5-11). Storrs, CT: The National Research Center on the Gifted and Talented.

Gubbins, E. J. (1994). "High-end learning": An educational necessity. In M. K. Gavin, E. J. Gubbins, D. R. Guenther, T. W. Neu, S. M. Reis, G. J. Robinson, D. Siegle, P. A. Schuler, & S. Vahidi, *Curricular options for high-end learning* (pp. 1-4). Storrs, CT: The National Research Center on the Gifted and Talented.

Johnson, S., & Reid, B. (no date). The artifact box exchange network. Bolton, CT: The Artifact Box Exchange Network.

National Council of Teachers of Mathematics. (1989). *Curriculum and evaluation standards for school mathematics.* Reston, VA: The National Council of Teachers of Mathematics.

Passow, A. H., (1982). Differentiated curricula for the gifted/talented. In *Curricula for the gifted: Selected proceedings for the First National Conference for the Gifted/Talented.* Ventura, CA: National/State Leadership Institute on the Gifted/Talented.

Reis, S. M., Burns, D. E., & Renzulli, J. S. (1992). *Curriculum compacting (videotape and handbook).* Storrs, CT: The National Research Center on the Gifted and Talented.

Reis, S. M., Westberg, K. L., Kulikowich, J., Caillard, F., Hébert, T., Plucker, J., Purcell, J. H., Rogers, J. B., & Smist, J. M. (1993). W*hy not let high ability students start school in January? The curriculum compacting study.* Storrs, CT: The National Research Center on the Gifted and Talented.

Renzulli, J. S. (1988). The multiple menu model for developing differentiated curriculum for the gifted and talented. *Gifted Child Quarterly, 32*(3), 298-309.

Renzulli, J. S. (1994). *Schools for talent development: A practical plan for total school improvement.* Mansfield Center, CT: Creative Learning Press.

Samara, J., & Curry, J. (1990). *Critiquing multi-product activities.* Austin, TX: The Curriculum Project.

Schuler, P. A. (1994). Creating a product and reporting the findings. In M. K. Gavin, E. J. Gubbins, D. R. Guenther, T. W. Neu, S. M. Reis, G. J. Robinson, D. Siegle, P. A. Schuler, & S. Vahidi, *Curricular options for high-end learning* (pp. 18-27). Storrs, CT: The National Research Center on the Gifted and Talented.

Siegle, D. (Ed.). (1993). *Curriculum compacting: Practitioners' guide.* Storrs, CT: The National Research Center on the Gifted and Talented.

Sternberg, R. J., & Clinkenbeard, P. R. (1993, Winter). Year 2 Updates: A theory-based approach to identification, teaching, and evaluation. *NRC/GT Newsletter,* p. 4.

Tomlinson, C. A., & Callahan, C. (1992, Fall). Year three research abstracts: Preservice teacher preparation in meeting the needs of the gifted. *NRC/GT Newsletter,* p. 5.

VanTassel-Baska, J. (1989). A comprehensive model of gifted program development. In J. Feldhusen, J. VanTassel-Baska, & K. Seeley, *Excellence in educating the gifted.* Denver: Love Publishing.

News Briefs

The U.S. Department of Education's Office of Educational Research and Improvement (OERI) recently published a monograph entitled, *The Identification of American Indian/ Alaska Native Children and Youth With Outstanding Talent*. Written by Carolyn Callahan and Jay McIntire, the monograph covers areas of concern and special considerations in identifying American Indian/Alaska Native students with outstanding talents. Some of the topics featured in the monograph include issues of diversity, cultural assimilation or accommodation, biases of testing methods, and selecting and constructing appropriate assessment tools. Copies of the monograph can be ordered for $5.50 each from New Orders, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 Ask for document S/N 065-000-00-6421.

• • •

The 20th anniversary celebration of The National Association for Creative Children and Adults will be held in Cincinnati, OH on September 3-5. This year's conference theme is *Early Influences on Future Creativity Productivity*. For registration information write: NACCA 20th Anniversary, 8080 Springvalley Drive, Cincinnati, OH 45236. The association also has a new creativity information brochure available. To order the brochure send a self-addressed stamped envelope and $1 to NACCA at the above address.

• • •

Teachers of gifted students in grades 5, 8, or 11 and Advanced Placement U.S. History instructors from New York, Connecticut, Pennsylvania, New Jersey, or Massachusetts are invited to apply to attend a free three-day training in Project LEGAL. The training involves using problem solving and critical thinking skills to teach students about legal issues. Supported with a grant from the National Diffusion Network, the workshop will take place August 31-September 2 in Callicoon, New York. Teachers interested in applying for the free workshops should contact Jim Carroll, Project LEGAL, Syracuse University, The Maxwell School, 513 Eggers Hall, Syracuse, NY 13244, phone 315-443-4720.

Classroom teachers who are interested in participating in an on-going study of attitudes towards creativity and evaluation of creative products should contact: Jonathan Plucker, The National Research Center on the Gifted and Talented, Curry School of Education, Emmet Street, Charlottesville, VA 22903. Involvement in the initial phase of the study will require a minimal time commitment of 5 to 10 minutes.

• • •

The Center for Research on Educational Accountability and Teacher Evaluation (CREATE) is conducting its third annual National Evaluation Institute on July 10-15 at Gatlinburg, TN. Institute sessions will focus on teacher evaluation, administrator evaluation, support personnel evaluation, school report cards, and program evaluation standards. Participants will work with nationally known evaluators and educators, including Peter Airasian, Arlen Gullickson, Virginia Helm, Richard Jaeger, James Sanders, William Sanders, Michael Scriven, James Stronge, and Daniel Stufflebeam. For registration information, contact: Sher Keller, The Evaluation Center, Western Michigan University, Kalamazoo, MI 49008, phone 616-387-5895, fax 616-387-5923.

• • •

The nonprofit Gifted Child Society announces the opening of the nation's only information hotline specifically for parents of gifted children. The Parent Information Network for Gifted (PING) offers weekday on-line phone consultation from 9 a.m. to 4 p.m. Eastern Time. In addition to answering specific questions, they also provide complimentary follow-up materials, suggestions about suitable reading materials for specific situations, and the names, addresses, and telephone numbers of state organizations and consultants. The service is available for $3 for the first minute and $2 for each additional minute. The hotline number is 1-900-773-PING.

• • •

The Association for the Gifted (TAG) division of the Council for Exceptional Children (CEC) awarded the NRC/GT its Certificate of Merit at the association's annual convention in Denver on April 7, 1994. It is the first time the award has been given to an institution. In announcing the award, Karen Rogers, vice president of TAG, said, "The body of useful information about research on, and classroom practices for, students with gifts and talents that the Center has made available to all educators will stand as a hallmark in the field in decades to come."

Exemplary Elementary School Programs in Gifted Education

Marcia A. B. Delcourt
McGill University
Montréal, Quebec

Abstract

The Learning Outcomes Study at The University of Virginia was a two-year investigation of academic and affective outcomes of 1,010 elementary school children in four types of programs for high ability learners (Within-class, Pull-out, Separate Class, Special School). The Learning Outcomes Study was extended by adding a qualitative dimension focusing on an exemplary model from each of the four program types. An exemplary model was one for which the program description was complete and internally consistent with the purposes of the program, the program goals and objectives matched the curriculum, and there was satisfaction with the program on the part of students, parents, teachers, and administrators. Characteristics of each program were examined through classroom observations as well as teacher, student, and parent interviews.

Recent Research

What characterizes a program identified as an "exemplary" model of a given type (Pull-out. Within-class, Separate Class. Special School)?

An examination of the five themes (leadership, atmosphere and environment, communication, curriculum and instruction, and attention to student needs), revealed that there are consistencies across all programs leading to recommendations for program development and implementation.

Leadership

In an exemplary model, there is a strong administrative voice to represent and implement the program for gifted learners. This individual oversees the development of long-term goals and objectives and communicates this information to everyone in the school community. These leaders ensure that staff and community members understand and support the program.

Atmosphere and Environment

An accepting atmosphere throughout the school promotes a positive attitude toward the program for the gifted and talented for students, parents, teachers, and administrators. In these programs, students are comfortable with their educational and social environments. Staff members are given the time, materials, and training to address the needs of gifted learners.

Communication

Clear and frequent communication is maintained between parents, teachers, students, and administrators regarding the program. This is accomplished through both general strategies (i.e., newsletters) and individual contacts (i.e., phone calls). These communications include commendations as well as recommendations about program activities and student performance.

Curriculum and Instruction

Teachers are flexible in matching both curriculum and instruction to student needs. They employ a variety of instructional techniques to complement student characteristics, and students feel that they are appropriately challenged. For example, a match is sought between the pacing of the curriculum and the student's ability in a given subject.

Attention to Student Needs

Academic staff and administrators are committed to serving students from traditionally underrepresented populations. They take assertive roles in selecting these students for their programs and inform their staff to be sensitive to the needs of these students once they enter the programs.

What are the influences of such exemplary programs on student achievement and motivation?

Parents, teachers, and students agree that two influences on student achievement and motivation involve providing challenges and choices. Challenges are presented through high-level content and pacing of the curriculum. Techniques such as curriculum compacting are used to present topics at an appropriate, more advanced level. One teacher said, "The grouping itself is a motivator since students can progress at a fast pace and they can work with each other to succeed." Corroborating this remark, a parent noted that her daughter ". . . likes the fact that she is in a class with other students who are on the same level."

Becoming self-motivated to achieve is easier for some students than for others. To assist with this goal, teachers also provide many opportunities for students to make their own choices and to obtain control over their learning environment.

What distinguishes the exemplary representative model in terms of its ability to serve diverse populations of students?

These "exemplary" models in gifted education address the needs of diverse populations of students in three main ways. First, all selected programs focused on the identification of underrepresented populations of students in their written policies. Specific populations included those from diverse cultural groups, the physically challenged, those with limited English proficiency (LEP), underachievers, and the economically disadvantaged. Second, by focusing on the individual needs of all students, teachers took into consideration specific characteristics related to these diverse populations of students. These characteristics included the use of nonstandard English and limited educational experience. Third, parental and community involvement were seen as vital to the success of the program and to each child's education. To establish these patterns of involvement, district coordinators invite parents to school events, distribute questionnaires about potential family interactions with the school, and keep parents informed about their child's educational program.

Recommendations

This section provides parents and educators with a series of questions they should ask about any program for the gifted and talented if they are to gather information on program practices. Following each set of questions, comments are provided to guide decision-makers in creating or improving their own programs for gifted learners.

What Should Parents and Educators Ask About Their Elementary School Gifted Programs?

Leadership. Who among the school district's administration is an advocate for this program within the school system and the community? Successful programs are characterized by at least one strong voice for the program. Supportive teachers and parents are crucial, but often not as influential as a school administrator in representing the program to other administrators, school personnel, and community members. This individual may be a specially trained coordinator for the gifted and talented, a superintendent or associate superintendent of the school district, a principal or assistant principal or another type of administrator.

How supportive of gifted education is this administrator? He or she should be a strong advocate of gifted education, and able to effectively represent the needs and characteristics of gifted and talented students to the community at large and to key groups of decision makers within the school district.

How long has the program been in existence? What type or types of programs are being implemented in the district (Special School, Separate Classroom, Pull-out program, Within-class program, other)? How long have these programs been operational? If the program type has changed over time, why did this occur? An indicator of an effective program is not necessarily the number of years it has been in existence, but the effort the administration employs to make the program the most appropriate model for meeting the needs of the students. A program that has changed its focus by changing the format and activities offered to students may either be indicative of a staff that wants change for the sake of change or one that is attentive to the needs of its clients. Ask why the change occurred, how the need for change was determined, and how the changes are being monitored. The most effective programs have a comprehensive evaluation design in place. Ask for a copy of the program description including the evaluation plan.

What are the decision-making processes for implementing and revising the program? A program administrator should be able to explain how the decisions are made regarding the program. This includes teacher selection, program development, student identification, curriculum implementation, and program evaluation. Parents and teachers should be involved in planning in order to promote program ownership among staff and community members.

What types of teacher training or staff development are provided in your district? Is this optional or required? Staff development regarding the needs of gifted and talented students should be a requirement for all faculty members. Additional support should be provided to staff working directly with the targeted students.

How are staff members selected to teach in this program? Are there state or local guidelines, certification? Guidelines for teacher preparation at the state or local levels make it easier for districts to select qualified personnel. Teachers should be selected according to their knowledge of the curriculum, their experience in addressing the needs of high ability learners, and their interest in working with exceptional students. The extent of the training considered acceptable to produce qualified personnel varies from completion of a few core courses in the education of gifted and talented

(continued on page 8)

(continued from page 7)

learners to completing a master's degree in the educational psychology of the gifted and talented. It is recommended that some form of theoretical and practical experience be obtained prior to working with gifted and talented students. Exemplary teachers report that they are involved in on-going educational training through their school staff development programs and through their initiatives.

Atmosphere and environment. What kind of classroom atmosphere do you like to develop? Atmosphere includes the entire school environment. An inviting atmosphere promotes a positive attitude toward the school and the program for parents, teachers, students, and administrators. This is not accidental. Staff members need to be given the time, materials, and instruction to create an integrated school atmosphere. For example, to promote learning as an on-going activity, role models from the community could share their interests and talents with students.

What impressions and concerns do parents, teachers, students, and administrators have about the program? A random selection of these individuals should reveal positive attitudes toward the program. All staff members, students, and parents should be informed about the program and should also feel that they can obtain additional information whenever necessary. The program should not be viewed as a luxury, only receiving support when there is extra money in the budget. This means that teachers of the gifted and talented should have appropriate materials and facilities to implement their curriculum.

Communication. What involvement do staff members have with the program (principal, librarian, school psychologist, fine arts teacher, etc.)? All staff members should be informed about the program and receive training in the characteristics and needs of gifted and talented students. This information should be deemed as important as that concerning the needs of any exceptional child. School personnel should also be involved in program planning whenever their expertise is required. They can serve on student identification committees and contribute to curriculum planning. For example, the librarian can provide valuable information by training the students in advanced reference skills, a lesson on map making can be coordinated with the fine arts teacher, and an advanced science class about the effects of exercise on the body can be taught in conjunction with the school nurse or a local physician.

How do teachers communicate with each other about the program? What type of communication do parents have with the school? Clear and frequent communication between all members of the program must be maintained (parents, teachers, students, administrators). General communication systems (newsletters, progress reports, large group meetings) and individual contacts (phone calls, conferences) should be employed. Communication with parents should include commendations as well as recommendations. This is especially important to parents who often obtain information from the school only when a child has done something wrong.

Curriculum and instruction. What do you see as the needs of the high ability students in your classroom? How do you address these needs? How is that process different from addressing the needs of other students in the class or school? Which particular strategies are used? Gifted and talented students have specific characteristics and needs which require the implementation of educational strategies that are different from those concerning their same-age peers. Teachers working with these students recognize these characteristics and are experienced in providing differentiated curricular activities. For example, an ability to process information more quickly indicates that a child needs less time and fewer repetitions to understand concepts. Indeed, a student so identified may have mastered content prior to its being formally introduced in the classroom. Teachers of the gifted and talented find it necessary to make changes in the content and pacing of the curriculum in order to appropriately challenge students and to make the most effective use of everyone's time.

Which educational model is implemented in your school and classroom? How is this achieved in your school? In your class? How does this model influence your teaching? What do you do differently compared to a classroom that does not use this model? Many programs for the gifted and talented are based on educational systems and models that incorporate content, strategies, and administrative designs developed specifically for high ability learners. These models should provide programs that are different from the regular curriculum. The differences should not be seen as special privileges for the gifted and talented, but as appropriate educational decisions.

What influence does this program have on student achievement, motivation, self-concept, and creativity? Programs should focus on both cognitive and affective outcomes for students. Achievement, motivation, self-concept, and creativity are some of the key areas included in goals, objectives, and the evaluation plan.

What type of evaluation procedures are used in the program? All programs should have explicit procedures for evaluating student progress and the effects of the program. The evaluation design should be directly related to the goals and objectives of the program.

What do you think it takes to be an effective teacher in this program? Teachers say that the most important teaching quality is flexibility. This means that they are aware of the many ways their students think and approach challenges in the classroom. Flexibility also means that teachers need to plan curricular activities that fully challenge the abilities of their students and are integrated in the short-term and long-range educational plans of the school district. For instance, specific learning outcomes determined by the state and local school boards may be achieved at a faster pace, thereby creating the need for alternative curricular approaches such as acceleration and enrichment. Highly creative students require a variety of outlets for their talents (e.g., art, music, dance, humor) and time for thinking.

Attention to student needs. How do you address the needs of students from culturally diverse and economically disadvantaged backgrounds? These particular groups have been noticeably absent from many programs for the gifted and talented. In order to remedy this situation, identification procedures and program activities must focus on the unique characteristics of individuals from diverse cultural groups. Whether a school district has one dominant racial/ethnic group such as African-American or Hispanic students or a number of subgroups represented in its population, the program for the gifted and talented should have a plan to actively recruit these students and to provide activities to address their needs.

How are individual expression and creativity viewed? How do students express their interests? What is the focus of the program with respect to a student's affective needs? How are students challenged within the program? How is this ascertained? What is the philosophy concerning student learning styles? Teachers should incorporate student interests into each subject. Students should be encouraged to express their ideas and to expand their thinking. Since students reported that they were most comfortable when their educational *and* social environments were positive, they should be given opportunities to feel challenged by academic rigor and to develop friendships with peers who share similar interests.

By referring to these themes and related questions, one will gather a significant amount of information about any program for the gifted and talented.

Peer Nomination Form Shows Promise With Minority Students

Caroline M. Cunningham
Carolyn M. Callahan
S. Christopher Roberson
Arlene Rapkin
The University of Virginia
Charlottesville, VA

The research staff at the University of Virginia has just completed an investigation of the reliability and validity of a peer nomination form developed by Dr. Anne Udall. Dr. Carolyn Callahan and research staff, Caroline Cunningham, Chris Roberson, and Ari Rapkin, selected the peer nomination form for investigation based on the commitment of The National Research Center to search out and investigate the soundness of alternative assessment tools to identify gifted and talented students.

In searching for solutions to the problem of minority underrepresentation in programs for the gifted, researchers have begun to turn their attention to identification strategies which extend beyond the traditional focus upon standardized measures. Frasier (1991) stresses the need to look beyond "paper" information, such as that found in standardized tests, to "people" information, such as that found in nominations. Such nominations can come from a variety of sources—teachers, parents, peers, and persons in the students' communities (Frasier 1989, 1992). Acting on the assumptions (a) that peer nominations may be less biased toward cultural differences than other forms of identification (Adams, 1990), (b) that they may allow for the recognition of otherwise untapped information concerning gifted minority students (Rhodes, 1992), and (c) that they could be a valuable means for identifying creativity in gifted students (Hadaway & Marek-Schroer, 1992), the NRC/GT selected an instrument that had preliminary evidence of face validity and content validity.

Despite the increased support and use of peer nomination, Gagné, Begin, and Talbot (1993) report that most of the peer nomination instruments currently being used "lack the barest information on their reliability and validity as screening instruments" (p. 39). Accepting the challenge to rectify this problem, we have examined the reliability and validity of Udall's peer nomination instrument. First, the instrument was revised based on Udall's earlier study of the instrument. The final

(continued on page 10)

(continued from page 9)

form of the instrument we investigated consists of 10 questions which address the following specific categories of gifted behaviors: speed of learning, task commitment/motivation, general intelligence, and creativity in the areas of play, music, art, and language. Examples of these questions are: "What boy OR girl learns quickly but doesn't speak up in class very often?" and "What girl OR boy is really good at making up dances?" Students are asked to evaluate their classmates' behaviors and then name those most fitting the listed categories.

The sample size for this study consisted of 555 fourth, fifth, and sixth grade students from 3 Collaborative School Districts—Tucson Unified School District and Amphitheater Schools in Tucson, AZ and Donna Independent School District in Donna, Texas—which have large Hispanic populations (>90%). Each participating teacher provided a list of the students who participated in the study and demographic information on each student—name, grade, gender, ethnicity, and whether or not the student had been identified as gifted by the school district. To measure the consistency of this instrument, we administered the peer nomination form twice using a time interval of 6 weeks between the 2 administrations. To ensure that the items on the instrument measure categories of gifted behaviors which we want them to measure, we established the relationships between individual items and clusters of items which addressed similar behaviors.

We found the overall consistency of the peer nomination instrument to be high as demonstrated by the test-retest reliability correlation obtained by administering the instrument twice. Individual items addressing specific areas of giftedness, such as art and music, also had high degrees of consistency. In addition, those questions or clusters of questions addressing the same categories of gifted behaviors related more closely with each other than with questions or clusters addressing different categories of gifted behaviors. This pattern serves as initial evidence of the instrument's construct validity, or its ability to measure what it is supposed to measure.

In both rounds of testing, females were nominated significantly more times than males on questions addressing general intellectual ability and dance ability. Males were nominated significantly more times than females in the area of drawing ability in both rounds and in the area of making up games in Round 1. These differences suggest that the scores on these particular questions be assessed differently for males and females. For example, in assessing general intellectual ability using this instrument, schools should closely examine nominations in their setting and adjust interpretation of nominations accordingly.

While ANOVA results showed differences by race for African-Americans and Asian-Americans in the second round, these results may be spurious due to the extremely small sample size of African-Americans and Asian-Americans included in the study. Further study using these populations is necessary before any conclusions can be drawn about the use of this instrument with African-American or Asian-American students. It is important to note that no significant differences were found between the nominations of Hispanics and Caucasians. Thus, this instrument reflected cultural neutrality toward Hispanics, the target population for this study. In addition, we found no significant differences across the grade levels.

While we suggest further study of this instrument using samples which reflect cultures other than Hispanic, our analyses of the reliability and validity of this instrument, as well as of the gender and race issues, suggest promise.

References

Adams, K. (1990). *Examining black underrepresentation in gifted programs.* (ERIC Document Reproduction Service No. ED 334 293)

Frasier, M. M. (1989). Identification of gifted black students: Developing new perspectives. In C. J. Maker & S. W. Schiever (Eds.), *Critical issues in gifted education: Defensible programs for cultural and ethnic minorities* (pp. 213-225). Austin, TX: Pro-Ed.

Frasier, M. M. (1991). Eliminating four barriers to the identification of gifted minority students. *Update on Gifted Education, 1*, 1-4.

Frasier, M. M. (1992). *Ethnic/minority children: Reflections and directions.* (ERIC Document Reproduction Service No. ED 344 407)

Gagné, F., Begin, J., & Talbot, L. (1993). How well do peers agree among themselves when nominating the gifted or talented? *Gifted Child Quarterly, 37,* 39-45.

Hadaway, N. L., & Marek-Schroer, M. F. (1992). Multidimensional assessment of the gifted minority student. *Roeper Review, 15,* 73-77.

Rhodes, L. (1992). Focusing attention on the individual in identification of gifted black students. *Roeper Review, 14,* 108-110.

NRC/GT welcomes these new Collaborative School Districts

Summit School
Elgin, IL

Fox Chapel Area School District
Pittsburgh, PA

Lancaster County School District
Lancaster, SC

Clover Park School District
Tacoma, WA

Identification and Evaluation Databases: Up and Running

Lori J. Lutz
Carolyn M. Callahan
The University of Virginia
Charlottesville, VA

Numerous schools and school systems do not have easy access to information regarding current identification and evaluation issues, practices, and instruments used in the education of gifted students. The National Repository of The National Research Center on the Gifted and Talented was established as a resource to provide empirical data to assist school administrators, teachers, and coordinators in making informed decisions about their identification and evaluation procedures.

In the past year, we have received over 70 requests for specific database searches. This demand indicates a strong interest in our databases. Nearly all of the identification and evaluation databases at the University of Virginia site are now established and organized to meet the demand of requestors. The identification databases include reviews of identification instruments, references to articles on the use of specific identification instruments and tests, references to articles about special identification issues and concerns, references to local identification instruments and processes, and a bibliography of published and standardized identification tests. Current evaluation databases include references to local evaluation instruments and processes.

A listing of standardized identification measures includes names and addresses of instruments. All this information may be located in a computer database according to a specified construct, such as general intellectual ability, verbal ability, task commitment, creativity, or acting ability; a school level (ranging from prekindergarten to high school); or a population such as learning disabled, Hispanic, African-American, or low SES. Requests most frequently center on the constructs of general intellectual ability, verbal ability, mathematical ability, creativity-ideation, creative problem-solving, inter/intra-personal ability, psychomotor ability, and mathematical achievement.

Requests have also been made for specific instruments, such as the *Torrance Tests of Creative Thinking*, *Raven's Progressive Matrices*, the *Cognitive Abilities Test,* and *Screening Assessment for Gifted Elementary Students*.

Evaluation databases continue to be revised. The two complete databases contain information about published and standardized instruments used in the evaluation of gifted students and/or gifted programs and articles about using information from evaluations. Four remaining databases are currently being revised and upgraded. A database of evaluation design articles includes summaries of models and assumptions underlying these design models and describes the use of design. The evaluation utilization database includes abstracts of articles on assessment issues, guidelines for effective evaluation, and considerations of factors affecting evaluation. Studies of program evaluation, evaluation utilization, and data collection, and articles presenting methods of effective evaluation comprise the evaluation bibliography database. Finally, a list of standardized instruments used in program evaluation is available.

Schools from across the U.S. have contributed their local identification and evaluation instruments to share with other schools that may be interested in examining alternative identification and evaluation methods. People requesting this information will receive copies of actual forms and addresses of the schools that use these forms so they can contact the schools if they want to implement similar procedures or to seek further information. People who are interested in using the NRC/GT's Repository of Identification and Evaluation Instruments can request an order form by calling the NRC/GT at University of Virginia at (804) 982-2849 or writing to the NRC/GT, Database Requests, Curry School of Education, 405 Emmet Street, University of Virginia, Charlottesville, VA 22903. Order forms will be sent and then the requestor can review and check off the desired database and specific components such as school level, construct, or evaluation question.

Locally Available Opportunities for Rural and Suburban Gifted Students

Jay A. McIntire
University of Virginia
Charlottesville, VA

Recent Research

It seems obvious that gifted students living in large cities, moderate-sized towns, and rural or small towns would tend to have different experiences, but rural students have not generally been recognized as a distinct subpopulation of gifted students until very recently. Although rural gifted students have been noted only occasionally in gifted education literature over the past twenty years (Caudill, 1977; Plowman, 1977; Spicker, Southern, & Davis, 1987), this population is now receiving considerable attention. Recent literature has addressed specific strategies for meeting the needs of this population (Benbow, Argo, & Glass, 1992; Guzik, 1994; Spicker, 1993), provided empirical research about the rural gifted (Cross & Stewart, 1993; Jones & Southern, 1992), and reported experiences of specific rural gifted children (Kantrowitz & Rosenberg, 1994; Whittemore, 1991). Two federally funded programs are currently providing services to some rural gifted students as well as providing much-needed data about this population (Spicker, 1993; Spicker, Fletcher, Montgomery, & Breard, 1993; Swanson, Elam, & Peterson, 1993).

Plowman (1977) stated that rural gifted students may be "unsophisticated - uninformed, lacking in social and learning skills, and deprived culturally and educationally" (p. 73). This implies that enriching experiences, whether provided by the school or available through the community, may be very important for rural gifted students. Jones and Southern (1992) reported that many existing programs for rural gifted children consist of "sporadic extracurricular programs," and enriching cultural and educational activities have been provided as one aspect of a recent innovative program for rural gifted students (Spicker, 1993).

Participation in extracurricular activities has been found to correlate with academic achievement (Laubscher, 1988). It has been reported that participation specifically in high school athletics increases educational aspirations (Cutright, 1987; Holland & Andre, 1987). Participation in athletics may be of special value to rural students, since they have lower educational aspirations than other U.S. students (Cobb, McIntire, & Pratt, 1989; Haas, 1992).

In light of existing literature, it seems that the availability of enriching extracurricular activities may be very important to the rural gifted. Caudill (1977) wrote, "The major problem that one faces when programming for gifted education in rural areas is the lack of enriching experiences and cultural opportunities for the students" (p. 91). Shore, Cornell, Robinson, and Ward (1991) concluded in their review of research that this and other assumptions about rural gifted students "would benefit from investigation" (p. 255).

In order to test the assumption that rural gifted students have fewer educational and cultural opportunities and experiences, investigators from the University of Virginia have gathered data from a survey of rural and suburban students from collaborative school districts of The National Research Center on the Gifted and Talented. In this study, rural students were defined as those attending schools in towns outside of U.S. Metropolitan Statistical Areas (MSAs), New England County Metropolitan Areas (NECMAs), and having fewer than 10,000 inhabitants. Suburban students were defined as those attending schools in towns outside MSAs and NECMAs with more than 10,000 inhabitants. Research in education uses inconsistent definitions of rural and suburban communities, but these criteria were deemed "reasonable" (W. G. McIntire, personal communication, Spring, 1992). A total of 235 gifted seventh and eighth grade students, representing 8 states (AK, CT, GA, HI, IL, MI, MT, & NE), were surveyed. Any students who were identified by their local schools as gifted were considered gifted for the purposes of this study.

Students were asked to report how many times they had personally attended each of the following cultural events during the year prior to the survey:

plays, musical performances, dance recitals, athletic events, art exhibits, and museums. Students were also asked to report how many of each of the following experiences were available to them as a participant in the 2 weeks prior to the survey (either in school or out of school): sports, vocal music, instrumental music, drama, visual arts, dance, interest clubs, service clubs, academic clubs, publications, student government, school-sponsored trips, and church activities.

Results

With gender and grade level controlled for by the use of multiple regression, several significant differences ($p < .01$) were identified. Rural students had attended more musical events and athletic events in the year prior to the survey than suburban students. Rural students also reported having attended a greater total number of cultural events in the prior year than their suburban counterparts. Suburban students did not report attending greater numbers of any of these types of events in the prior year than did rural students.

However, in comparing the number of activities available to the students as participants during the prior 2 weeks, suburban gifted students reported significantly more opportunities in the following areas: instrumental music, drama, dance, and school-sponsored trips. Rural gifted students reported more opportunities to participate in sports activities than did suburban students.

Discussion

This survey yields mixed results with respect to the question of whether or not rural gifted students have fewer educational and cultural opportunities and experiences than their counterparts from larger towns. Rural gifted students attended a greater number of cultural events in the last year than their suburban gender and grade peers, and specifically attended more athletic and musical events. Suburban gifted students had greater numbers of available activities to choose from involving instrumental music, drama, dance, and school-sponsored trips, while rural gifted students had more opportunities only in the area of sports.

It appears that rural gifted students have access to a narrower spectrum of local opportunities than their suburban counterparts and are particularly limited in the cultural areas of drama, dance, and instrumental music. In spite of their limited access to experiences, rural gifted students attended more cultural events than their suburban peers. This finding is consistent with the report by Schmuck and Schmuck (1992) that most teenagers in small rural schools "felt involved in extracurricular activities" (p. 19). Rural gifted students, though they may be disadvantaged by the breadth of opportunities, take advantage of them more than their suburban peers. It does not appear, based on this study, that rural students in grades 7 or 8 have fewer cultural experiences than suburban gifted students. If the rural gifted are, in fact, "unsophisticated uninformed, lacking in social and learning skills, and deprived culturally and educationally" (Plowman, 1977, p. 73), it does not seem that lack of locally available opportunities is the source of these traits.

References

Benbow, C. P., Argo, T. A., & Glass, L. W. (1992). Meeting the needs of the gifted in rural areas through acceleration. *GCT, 15*, 15-19.

Caudill, G. (1977). Program implementation and programming for rural gifted students. (pp. 91-93). In National/State Leadership Training Institute on the Gifted and Talented, *Ideas for urban/rural gifted/talented*. Ventura, CA: Ventura County Superintendent of Schools.

Cobb, R. A., McIntire, W. G., & Pratt, P. A. (1989). Vocational and educational aspirations of high school students: A problem for rural America. *Research in Rural Education, 6*(2), 11-16.

Cross, T. L., & Stewart, R. A. (1993, November). *Phenomenology of the experience of giftedness in rural schools*. Paper presented at the annual convention of the National Association for Gifted Children, Atlanta, GA.

Cutright, M. (1987). How athletics affect your child in and out of school. *PTA Today, 8*(5), 7-8.

Guzik, T. (1994). AP classes in a rural high school? No problem. *Tempo, 14*(1), 9.

Haas, T. (1992). *What can I become? Educational aspirations of students in rural America* (ERIC Digest EDO-RC-91-11) Charleston, WV: ERIC Clearinghouse on Rural Education and Small Schools.

Holland, A., & Andre, T. (1987). *The effects of participation in extracurricular activities in secondary school: What is known, what needs to be known?*. Ames, IA: Iowa State University. (ERIC Document Reproduction Service No. ED 290 804)

Jones, E. D., & Southern, W. T. (1992). Programming, grouping, and acceleration in rural school districts: A survey of attitudes and practices. *Gifted Child Quarterly, 36*, 112-117.

Kantrowitz, B., & Rosenberg, D. (1994, January 10). In a class of their own. *Newsweek,* p. 58.

Laubscher, S. (1988). *The significance of participation in extramural activities: An annotated bibliography*. South Bend, IN: Indiana University. (ERIC Document Reproduction Service No. ED 298 655)

Plowman, P. (1977). What can be done for rural gifted and talented children and youth. (pp. 73-87). In National/State Leadership Training Institute on the Gifted and Talented, *Ideas for urban/rural gifted/talented*. Ventura, CA: Ventura County Superintendent of Schools.

Schmuck, R. A., & Schmuck, P. A. (1992). *Small districts, big problems: Making school everybody's house*. Newbury Park, CA: Corwin Press.

Shore, B. M., Cornell, D. G., Robinson, A., & Ward, V. S. (1991). *Recommended practices in gifted education: A critical analysis*. New York: Teachers College, Columbia University.

Spicker, H. H. (1993). Identifying and enriching rural gifted children. In D. Montgomery (Ed.), *Rural America: Where All innovations begin. Conference Proceedings* (pp. 67-72). Savannah, GA: American Council on Rural Special Education.

Spicker, H., Fletcher, R., Montgomery, D., & Breard, N. (1993). Rural gifted education in a multicultural society. In D. Montgomery (Ed.), *Rural America: Where all Innovations Begin. Conference Proceedings* (pp. 417-422). Savannah, GA: American Council on Rural Special Education.

Spicker, H. H., Southern, W. T., & Davis, B. I. (1987). The rural gifted child. *Gifted Child Quarterly, 31,* 155-157.

Swanson, J. D., Elam, A., & Peterson, J. (1993, November). *SEARCH: Selection, enrichment, and acceleration of rural children*. Paper presented at the annual convention of the National Association for Gifted Children, Atlanta, GA.

Whittemore, H. (1991, December 22). The most precious gift. *Parade*, pp. 4-6.

Changing the Way We Perceive "Creativity"

Jonathan A. Plucker
The University of Virginia
Charlottesville, VA

Flatow, I. (1992). *They all laughed...From light bulbs to lasers: The fascinating stories behind the great inventions that have changed our lives*. New York: Harper Perennial.

Gardner, H. (1993). *Creating minds: An anatomy of creativity seen through the eyes of Freud, Einstein, Picasso, Stravinsky, Eliot, Graham, and Gandhi*. New York: Basic Books.

Weisberg, R. W. (1993). *Creativity: Beyond the myth of genius*. New York: W. H. Freeman.

If the two decades immediately following Guilford's (1950) famous APA address were the "Golden Age" of creativity, there is ample evidence that we are undergoing the "Modern Age" in the study of creativity. Theories are increasingly interdisciplinary and involve system perspectives, centers for creativity research and leadership are becoming firmly established and internationally-renowned, and individuals from a variety of backgrounds express a willingness to tackle some of creativity's tougher problems (e.g., identification, assessment, acceptance-gaining, relationship to other cognitive processes). The study of creativity is entering its renaissance, and, as a result, there has been a flurry of publishing activity with respect to materials on creativity.

Three of the most recent creativity books to cross my desk are also three of the most thought provoking: Ira Flatow's *They All Laughed...*, Howard Gardner's *Creating Minds*, and Robert Weisberg's *Creativity: Beyond the Myth of Genius*.

When reading these books, the following questions may serve as guides:

- *Who is the author's target audience - educators, theoreticians, researchers?*
- *What is the author's stated purpose for writing the book?*
- *How does the book attempt to change the way we view "Creativity"?*
- *Regardless of the intended audience, how can the author's ideas be translated into classroom practice?*
- *How valuable are examinations of the lives and/or works of creative, historical figures?*

Of these three books, Howard Gardner's *Creating Minds* will have the most substantial impact upon the study of creativity. Using a methodological framework that has emerged over the past few years (Gardner, 1988; Gardner & Nemirovsky, 1991), Gardner analyzes seven of the "great creators," all of whom were contemporaries: Sigmund Freud, Albert Einstein, Pablo Picasso, Igor Stravinsky, T. S. Eliot, Martha Graham, and Mahatma Gandhi. *Creating Minds*' most significant contribution is the method that Gardner uses to analyze all aspects of the lives of these seven individuals. He stresses several overarching, organizing themes to guide his investigations, which he approaches from developmental and social/environmental interaction perspectives.

Some of Gardner's most interesting findings include the high degree of self-promotion that each individual used to gain attention for his or her creative works, the observation that "important events and breakthroughs" occurred roughly 10 years apart, and the fact that many of the creators grew up in households where affection and intimacy, if present at all, were based upon achievement. While I disagree with some of Gardner's positions, including the potential importance of a biological basis for creativity, these are minor issues when compared to the book's considerable contributions to the study of creativity.

Flatow's *They All Laughed...* is a collection of stories about some of humankind's major inventions (e.g., the lightbulb, television, lasers, submarines, nylon). Each section is written in a very readable, almost anecdotal style, but a great deal of pertinent detail is included. Many widely held misconceptions are debunked, including the notion that Thomas Edison tried carbon as a lamp filament in the lightbulb serendipitously (incidentally, no fewer than 13 inventors had tried carbon filaments in their lightbulbs over the previous 34 years).

I found Flatow's accounts of the "behind-the-scenes" maneuvering and politics that influenced the acceptance of these inventions to be especially interesting. For example, Edison, who had invested a great deal of time and money into the use of direct current (DC) electricity, was worried when George Westinghouse's company, which sold alternating current (AC) electricity, became profitable. The ensuing dispute included the world's first execution through the use of the electric chair. Edison, claiming that AC was far more dangerous than his own DC, convinced the State of New York that electrocution using AC electricity (and a Westinghouse generator) would be humane. Of course, Edison hoped that AC would become synonymous with lethality, but by the time the gruesome spectacle was reported in the newspapers, Westinghouse had an unbreakable monopoly in the electricity industry.

In *Creativity: Beyond the Myth of Genius*, Weisberg seeks to "discuss the components of ordinary thinking and how they underlie even the greatest examples of creativity" (1993, p. xiii). Previously, Weisberg (1986)

criticized the widely held belief that creativity is the result of "extraordinary thinking," or what he refers to as the "genius" approach to the study of creativity.

In his effort to stress the underlying role of ordinary thinking to the creative process, Weisberg uses the first two chapters to familiarize the reader with the genius-ordinary thinking debate and to stringently critique the genius position, especially the role of intuition, insight, and the unconscious in the creative process. The concept of the creative personality is analyzed with the conclusion that the role of the personality has been oversimplified and overemphasized. An impressive amount of evidence supporting the "ordinary thinking" position is also presented. Weisberg often uses historical case studies to illustrate his points, and he is most successful when he analyzes the inventive or scientific experiences of "genius" creators in order to illustrate the preponderance of "ordinary thinking" in even the most renowned examples of creative accomplishment.

Many of Weisberg's comments will surprise the reader (e.g., brainstorming is highly overrated as a creative thinking technique), and many more will provoke a great deal of debate. This is Weisberg's most significant contribution: by questioning some of the long-held beliefs and themes of the study of creativity, a long overdue debate may have finally come to the forefront.

From the perspective of a classroom teacher, Flatow's book is clearly the most useful. Students will find the stories to be quite entertaining, and educators can use it to enrich content across a variety of disciplines, including the physical sciences, engineering, business, and thinking skills. Teachers will also find Weisberg's work to be thought provoking as it causes them to question their beliefs about creativity.

Creativity researchers will find the Gardner and Weisberg books to be interesting and useful. Gardner introduces a method for investigating creative lives and effectively shows how it can be used, and Weisberg questions many of the underlying assumptions of creativity research, theory, and education. And both authors include enough "bombshells" to spark debate for many years to come.

References

Gardner, H. (1983). *Frames of mind.* New York: Basic Books.

Gardner, H. (1988). Creative lives and creative works: A synthetic scientific approach. In R. J. Sternberg (Ed.), *The nature of creativity* (pp. 298-321). Cambridge, MA: Cambridge University Press.

Gardner, H., & Nemirovsky, R. (1991). From private intuitions to public symbol systems: An examination of the creative process in Georg Cantor and Sigmund Freud. *Creativity Research Journal*, *4*, 1-21.

Weisberg, R. W. (1986). *Creativity: Genius and other myths.* New York: Freeman.

Newsletter Staff

The NRC/GT Newsletter is published by The National Research Center on the Gifted and Talented, The University of Connecticut. The Research Center is funded by the Office of Educational Research and Improvement, U.S. Department of Education. The opinions expressed in this publication do not necessarily reflect the position, policy, or endorsement of the Office or Department.

OERI Project Liaisons:
Ivor Pritchard
Patricia O'Connell Ross

Please send change of address notification to NRC/GT Mailing List, The University of Connecticut, 362 Fairfield Road, U-7, Storrs, CT 06269-2007. Please include the address label from this issue. Phone (203-486-4826) FAX (203-486-2900)

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

The University of Connecticut
The National Research Center on the Gifted and Talented
362 Fairfield Road, U-7
Storrs, CT 06269-2007

Non-Profit Org.
U.S. Postage
PAID
The University of Connecticut