DOCUMENT RESUME

ED 437 778 EC 307 626

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TITLE The National Research Center on the Gifted and Talented (NRC/GT) Newsletter, 1996.

INSTITUTION National Research Center on the Gifted and Talented, Storrs, CT.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE 1996-00-00
NOTE 34p.; Newsletter published biannually.
CONTRACT R206R50001
AVAILABLE FROM NRC/GT Newsletter, University of Connecticut, The National Research Center on the Gifted and Talented, 362 Fairfield Road, U-7, Storrs, CT 06269-2007. Tel: 860-486-4676; Fax: 860-486-2900; For full text: http://www.gifted.uconn.edu/.
PUB TYPE Collected Works - Serials (022)
JOURNAL CIT The National Research Center on the Gifted and Talented; Win-Spr 1996
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Ability Identification; Creativity; *Educational Methods; Elementary Secondary Education; *Gifted; *Grouping (Instructional Purposes); Information Sources; Minority Group Children; Research and Development; *Teacher Attitudes; *Theory Practice Relationship
IDENTIFIERS *National Research Center on Gifted and Talented

ABSTRACT

Two newsletters from the National Research Center on the Gifted and Talented (NRC/GT) include the following major articles: (1) "Everything You Need To Know about the NRC/GT: Web Site, Videos, and Texts" (E. Jean Gubbins); (2) "A. Harry Passow: Scholar and Friend" (E. Jean Gubbins and Joseph S. Renzulli); (3) "Learning How New Teachers Relate to Academic Diversity in Mixed Ability Classrooms" (Carol Ann Tomlinson); (4) "Total School Cluster Grouping: An Investigation of Achievement and Identification of Elementary School Students" (Marcia Gentry); (5) "Valuing, Identifying, Cultivating, and Rewarding Talents of Students from Special Populations" (David St. Jean); (6) "NRC/GT through the Year 2000 (E. Jean Gubbins); (7) "Still Searching..." (Julie D. Swanson); (8) "A Tribute to Paul F. Brandwein" (E. Jean Gubbins and Joseph S. Renzulli); (9) "Extending the Pedagogy of Gifted Education to All Students" (Sally M. Reis and others); (10) "Stimulating Student Creativity: A Review of 'Creativity in the Classroom'" (Bruce N. Berube). (Individual papers contain references.) (DB)

The National Research Center on the Gifted and Talented, 1996.

National Research Center on the Gifted and Talented
Storrs, CT.

1996 Spring Newsletter

The National Research Center on the Gifted and Talented

University of Connecticut
City University of New York, City College
Stanford University
University of Virginia
Yale University

What You'll Find In This Issue...

Everything You Need to Know About the NRC/GT: Web Site, Videos, and Texts

E. Jean Gubbins
University of Connecticut
Storrs, CT

WE ARE KNOWN AS THE National Research Center on the Gifted and Talented (NRC/GT). With all the technology available, however, we are essentially an international center. Our research is conducted in the United States and soon finds its way all over the world. Recently, Dr. Siamak Vahidi created a web site (www.ucc.uconn.edu/~wwwgt) for the University of Connecticut, highlighting the NRC/GT, Confratute—Summer Institute on the Gifted and Talented, Three Summers Program, and a new project—UConn Mentor Connection. All of these programs and opportunities for administrators, teachers, and students have a common purpose—*talent development.* The interest in talent development is universal. Our first contact on the new web site was from the Republic of Singapore and the second from Leeville, South Carolina. People are eager for more information about the research findings and the educational opportunities to further their own knowledge and expertise. The NRC/GT web site contains our mission statement, abstracts of all our publications to date, our products list, text of the Winter 1996 newsletter, names and addresses of the participating universities and research teams, and links to home pages posted by the University of Connecticut, City University of New York—City College, Stanford University, University of Virginia, and Yale University. Through these links you may learn about features of each university such as academics, admissions, cultural events, and sports.

Technology makes information readily available using a few keystrokes. If connecting to the NRC/GT by computer keystrokes is not an option for you, consider accessing our videotape collection. During the first five years of the Center, we developed a series of videotapes to keep you informed of our research results and to provide you with concrete examples of translating research into classroom practices. From our first live videotape on *Curriculum Compacting: A Process for Modifying Curriculum for High Ability Students* (Reis, Burns, & Renzulli, 1992) to subsequent ones on *The Explicit Teaching of Thinking Skills: A Six-Phase Model for Curriculum Development and Instruction* (Burns, 1993), *Curricular Options for "High-End" Learning* (Gavin et al., 1994), and *Enrichment Clusters: Using High-End Learning to Develop Talents in all Students* (Gentry, Reis, Renzulli, Moran, & Warren, 1995), we showcased classrooms as students and teachers experimented with strategies to promote the talents of young people. Videotape footage recorded the steps to reducing the repetition of mastered curriculum, defining and infusing thinking skills in multiple content areas, applying the strategies of curriculum differentiation, and designing and implementing enrichment clusters for a schoolwide focus on talent development. If you still need to know more about the NRC/GT, we have that information available, too.

Just over a year ago, we assembled our research teams and held our first conference entitled "Building a Bridge Between Research and Classroom Practices in Gifted Education" to provide people with another venue for

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first-hand information on the latest research findings. As presenters discussed their work with hundreds of practitioners, two film crews and a host of NRC/GT staff members conducted interviews with several researchers. We asked our researchers to reflect on their work and synthesize findings related to:

- nontraditional assessment;
- high potential, high risk learners;
- challenging learning opportunities; and
- professional development.

The videotape module entitled *The National Research Center on the Gifted and Talented: Reaching the Destination* (Gubbins, 1995) provides topical commentaries from our researchers. The module is designed for teacher trainers or as a self-study approach. Previewing the tape and reviewing the presentation guidebook provides a quick overview of the major topics. Segments of the presentation guidebook are followed by discussion questions and selected resources. Scanning the discussion questions aids you in deciding which findings you would like learn more about. The presentation guidebook serves as transparency masters to share with audiences or as print resources.

A sample of topical comments will hopefully spur further discussions among practitioners as you plan, develop, implement, and evaluate programs and services for students with known and emergent talents. The topic of nontraditional assessment is of primary importance under the Jacob K. Javits Gifted and Talented Students Education Act. How would you describe your present approach to screening and identifying potentially gifted and talented students? Do you have a comprehensive, defensible approach that is sensitive to the student populations of your district? Donna Ford, University of Virginia, reminds us:

> Gifted students should be assessed more than just identified. With identification you answer one question: Is the child gifted or not? You get a yes/no answer. Assessment is more comprehensive and thorough and tells us not only whether the child is gifted, but in what ways he/she is gifted so that we can meet not only academic needs, but social, emotional, and psychological needs as well.

A multi-dimensional assessment system should be created including information from parents, teachers, students, and peers.

> The multi-dimensional assessment must be comprehensive and defensible, and it must inform instruction. Identification, teaching, and evaluation should be regarded as integral links to improving the educational opportunities for high potential, high risk learners. *(E. Jean Gubbins)*

Designing and developing a multi-dimensional assessment system requires careful review and consideration of potential instruments that reflect the goals and objectives of the programs and services. The instruments should not be restricted to pencil and paper tests implemented during a single session.

> We see a combination of new instruments and new techniques. . . which involves people looking at children over a longer period of time trying to get involved in bringing out the talent that's there, actually eliciting talent as much as identifying talent. *(Carolyn Callahan)*

> We need to take a proficiency view, take a look at the strengths within cultures, take a look at the strengths of students, and find reasons within those strengths to provide services to students. *(Scott Hunsaker)*

Looking at the strengths of students is a change in mind-set for some of us because much of our earlier training as teachers centered on looking at the deficiencies of skills among students. Now we realize that a focus on strengths allows us to enhance students' abilities and work towards eliminating deficiencies by engaging them in the curriculum.

> We need to arrange opportunities within the curriculum for young people to engage in hands-on explorations in topics of their interest so that we can see talents emerge. *(Jann Leppien)*

When the focus on talents is not the primary philosophy of the school, students' strengths may not emerge. Sally M. Reis comments:

> We investigated the experiences of college age students with learning disabilities. Most had been very bright in elementary school and had not been identified for gifted programs. . .or programs for learning disabled students. . . . Their brightness was enough so that they could do well on most of the tests for learning disabilities. . . .
>
> As the students got older, the learning disability became more pronounced. . . . They oftentimes did not gain the compensation strategies they would have needed had they been participating in a program—they started to have more problems in school.

High potential, high risk learners can sometimes be overlooked unless we incorporate multi-assessment procedures and use the curriculum to elicit the skills and abilities.

> The talents of high potential, high risk learners will be unveiled by enriching the tapestry of the curriculum. The emphasis

becomes more than just *talent recognition*—it is *talent development. (E. Jean Gubbins)*

Carol Tomlinson notes that creating challenging learning opportunities can be accomplished in many ways such as pre-assessing students' skills, amplifying learning opportunities, providing choices for students, and differentiating professional development opportunities.

> The easiest way to build in relevance and challenges in curriculum is to give young people some opportunity to select the work that they would like to pursue, ordinarily in the form of a project that leads to a product or some kind of service. *(Joseph S. Renzulli)*

Working with students' strengths and interests helps us to consider responses to questions such as:

- What is the level of challenge in our curriculum?
- What documentation exists that describes the challenge level of our curriculum?
- In what ways can we differentiate the curriculum to offer more challenging learning environments?

To make changes in screening and identification procedures and curricular options requires professional development opportunities for administrators and teachers.

> So much of our training in the past as classroom teachers has been prescription and didactic teaching strategies. We need to work with teachers to move the model of teaching to involve the children—to engage them in exploration. *(Jann Leppien)*

> We are asking teachers to think of students in terms of academic abilities, interests, and style preferences. This is a tremendous change for teachers. We need to provide teachers with time to make these changes. *(Jeanne Purcell)*

Changing instructional approaches and providing curricular options requires time:

> Time has to be built in so that people can make the changes personally before they can make the changes with respect to their instruction. *(Deborah Burns)*

Providing time and opportunities for professional development and follow-up opportunities with peer coaches results in more effective adoption and implementation of new strategies. Definite differences between the quality of teacher training and actual practice have been documented:

> Teachers who are successful in using differentiated strategies have been *shown how* to make modifications versus *told how* to make modifications. *(Karen Westberg)*

We continually try to show practitioners how to translate research findings into practices. With our multi-media approach, we reach our target audiences. Another text resource also lends itself to providing you with "everything you need to know about the NRC/GT": *Developing the Gifts and Talents of All America's Students: NRC/GT 1990-1995.* This monograph summarizes the scope of the NRC/GT and synthesizes the findings and themes across studies and commissioned papers. The findings and themes complement the topical commentaries by our researchers from the videotape described above entitled *The National Research Center on the Gifted and Talented: Reaching the Destination* by focusing on:

- characteristics and identification;
- special populations;
- program impact, options, and outcomes;
- professional development; and
- policy, program organization, and management.

Following this synthesis of the research, we provide readers with abstracts of over 50 publications and accompanying guidelines, recommendations, or conclusions. These briefing sheets offer a concise format for readers as you search for the most pertinent research-based findings to improve and enhance your programs and services for students with known and emergent talents. We will continue to provide practitioners with information about the NRC/GT through our web site, videos, and texts as we proceed with our research agenda through the year 2000.

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A. Harry Passow: Scholar and Friend

E. Jean Gubbins
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THE FIELD OF EDUCATION often reflects the ebb and flow of ideas of scholars and practitioners, which at first blush sound new or cutting edge. Then we realize the ideas can be traced back to earlier viewpoints so well constructed they stood the test of time. Studying the evolutionary ideas results in a sense of admiration and respect for the person who penned the earlier thoughts. Dr. A. Harry Passow was such a person whose ideas make us proud to have known him as a scholar and friend. Dr. Passow died March 28, 1996, and his personal and professional legacies to the world are immeasurable. We treasure our encounters with him, whether they were face-to-face meetings, telephone conversations, or reading the numerous books and articles by such an incredible wordsmith.

Harry's many gifts and talents were evidenced in initial encounters with him. Just listening to him tell a story made you realize that he was destined to write. His words and ideas flowed so gracefully. He captured your attention with his gentle demeanor, sound grasp of relevant research, and keen perspectives from experiences. Over 40 years ago, Harry talked about issues that sound so current in the field of gifted and talented education in the 1990s. He was acutely aware of the importance of developing the talents of young people, studying the scholastic underachievement among bright students, determining the effects of ability grouping, and opening opportunities for disadvantaged learners before some of us even realized the importance of these issues.

In 1979, Dr. A. Harry Passow served as the editor of *The Gifted and the Talented: Their Education and Development, The Seventy-eighth Yearbook of the National Society for the Study of Education*. He assembled a team of scholars to prepare chapters on nurturing and educating students with high abilities. In a closing chapter entitled "A Look Around and a Look Ahead," Harry delineated some generalizations and principles that could have been written in response to educational issues of the 1990s. A few statements illustrate the prophetic relevance:

- A design for a curriculum for the gifted and talented should provide for differentiation of goals, content, instructional strategies, resources, and evaluation.
- The desired balance between basic general education and specialized education in the program for gifted and talented students should determine the selection of content and instructional strategies.

- Various gifts and talents emerge, can be identified, and can be nurtured at different developmental levels.
- Gifted and talented students need access to a variety of "teachers"—instructors, mentors, counselors, and role models.
- Programs for the gifted and talented must be viewed as an integral part of an ongoing educational program of the school system and not as an appendage or a luxury. (Passow, 1979, pp. 447-451)

Harry's words and wisdom offered us guidance in designing and developing programs when they were published almost two decades ago, and they continue to hold promise for the vision of what could or should be. Fortunately, in many schools around the world, these generalizations and principles are practiced regularly because they represent the best of educational research and practice. Harry knew and understood the educational milieu of advantaged and disadvantaged students in urban, suburban, and rural environments. His first-hand knowledge of schools and his communications with educators paid off tenfold as he wove his visions for schools into his many writings.

We were honored to have Harry collaborate with The National Research Center on the Gifted and Talented on several monographs. He called us one day to talk about a policy study. He collected legislative and regulatory documents, as well as resource books, from 49 states and reviewed them for explicit and implicit policy statements regarding the education of gifted and talented children. He wanted to know if we were interested in publishing a summary of his study. We were thrilled with his request because we knew the quality of his review process and recognized how valuable such a document would be to practitioners and legislators. Harry, as the lead author,

presented us with a research study on *State Policies Regarding Education of the Gifted as Reflected in Legislation and Regulation* (1993), highlighting critical elements of program planning such as:

- philosophy or rationale;
- definitions of gifted and talented;
- identification procedures;
- differentiated curriculum and instruction;
- counseling and support services; and
- program evaluation.

Harry continued his collaborative work with the NRC/GT by co-authoring monographs that present historical, philosophical, and contemporary perspectives on two major issues in the field: identification and assessment. Dr. Mary M. Frasier and Jaime H. Garcia of the University of Georgia and Dr. A. Harry Passow produced the following monographs that will continue to influence discussions and directions in the field for decades to come:

> Frasier, M. M., & Passow, A. H. (1994). *Toward a paradigm for identifying talent potential.* Storrs, CT: University of Connecticut, The National Research Center on the Gifted and Talented.
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> Frasier, M. M., Garcia, J. H., & Passow, A. H. (1995). *A review of assessment issues in gifted education and their implications for identifying gifted minority students.* Storrs, CT: University of Connecticut, The National Research Center on the Gifted and Talented.

Harry never shied away from critical educational issues; he always approached them with the sense of an historian, the intellect of a philosopher, and the analytical skills of a researcher. In the past few years, there has been a considerable amount of discussion about grouping practices. Some people thought it was a new issue; others realized that it was cycling back into the education scene. In 1962, Harry prepared an article for *Educational Forum* (Volume 28) entitled "The Maze of the Research on Ability Grouping." He reviewed research findings and discussions dating back to the 1920s and summarized the difficulties in generalizing from the research. He noted that the problems of equating and synthesizing research findings stem from the following:

- The studies vary considerably in scope of aim and purpose.
- The studies differ in the number of students, the number of groups, and the size of the classes involved.
- The studies differ in their duration—ranging from a semester or less to a year or more.
- The studies differ in the adequacy of the selection bases and the means of matching experimental and control groups.
- The studies differ in the "treatment"—i.e., the differentiation of curricula and methods of teaching.
- The studies differ in the deployment of teachers in various groups.
- The studies differ in the instruments and techniques used in evaluating changes in students.
- The studies have generally failed to assess the effects of grouping on teachers and administrators. (Passow, 1962, pp. 285-288)

Harry's analytical approach did not involve meta-analysis, best evidence synthesis, or calculation of effect sizes. However, he certainly critiqued the research and made us realize that the issue was one of *what goes on in the group that makes the difference*—not the grouping practice. Harry recognized the importance of research and practice throughout all of his writings. As readers, we continue to come away with a sense that he really clarified the issue. What an incredible gift he has shared with all of us who keep returning to his words for future directions!

Harry's dedication to equity and excellence in schools will be witnessed for generations because of his extensive professional legacy. In an article for *Gifted Education International* (Volume 10) entitled "Families and Communities: Essential Resources for Nurturing Giftedness and Talent," he reminds us that

> The school is the catalyst for talent identification and talent development. (Passow, 1995, p. 55)

In many ways, Dr. A. Harry Passow was a catalyst for the field of gifted and talented education. With his gentle manner and incredible wisdom, he guided us for decades. His words will always be with us and our personal memories of him over the years will remain in our hearts.

A Tribute

Carolyn R. Cooper
Project HIGH HOPES
Hamden, CT

A. Harry Passow promulgated a gentler belief about the nature of giftedness. He stated in Essays on the Intellect, ASCD (1985):

> *What educators and psychologists recognize as giftedness in children is really **potential** giftedness, which denotes **promise** rather than fulfillment and **probabilities** rather than certainties about future accomplishments.*
>
> *How high these probabilities are in any given case depends on the match between a child's budding talents and the kinds of nurturance provided.*

Harry Passow believed unequivocally that what we challenge children to think about must be substance that will nurture their talent. He believed in offering children high-quality experiences to enrich their lives.

It's been said that progress comes from sticking your neck out. Standing on one or two giants' shoulders doesn't hurt, either. Harry, please let us stand on your shoulders for a while. We can think of no one who has embodied these ideals more fully. Help us experience even a fraction of the gentle humanness that was you. We will miss you, friend. Shalom!

Learning How New Teachers Relate to Academic Diversity in Mixed Ability Classrooms

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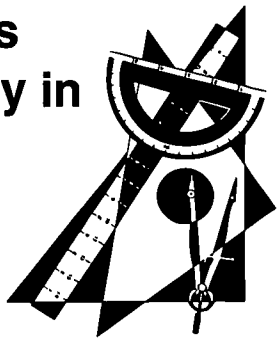

IN A BURGEONING NUMBER of classrooms around the country, heterogeneous grouping of students is the order of the day, and general classroom teachers find themselves unsure of how to adjust instruction in response to the readiness levels, interests, and learning profiles of students who differ widely in those ways. Research tells us that teach-to-the-middle instruction still prevails in our schools and that few veteran teachers are predisposed to differentiate instruction (that is, to modify what and how they teach) for students who differ significantly from the norm.

If it is the case that experienced teachers find it difficult to make changes in their practice so that they can establish classrooms with appropriately differentiated curricula, we might hypothesize that our best hope for addressing academic diversity in heterogeneous settings lies in novice teachers who may possess both state-of-the-art training and the flexibility necessary to establish classrooms with varied avenues to learning. Yet a strong body of research indicates that prospective teachers leave teacher education programs with relatively the same set of beliefs about teaching with which they entered these programs. In part, teacher education programs appear unable to reshape novice teachers' views of schooling because of the power of the images of teaching and learning that formed during the dozen or more years of schooling beginning teachers encountered prior to formal teacher education. This research calls into question the flexibility of novice teachers in breaking entrenched patterns of educational practice.

While much research exists on how novice teachers make the transition from college or university into full time teaching, little research has been done on how novices come to understand and address the needs of academically diverse learners during the earliest stages of teaching. The University of Virginia site of The National Research Center on the Gifted and Talented recently concluded a 3-year project entitled Preservice Teacher Preparation in Meeting the Needs of Diverse Learners, studying how novice teachers grow in their early attempts to think about and plan for students who are gifted, learning disabled or remedial, in the context of general classrooms.

Research Design

The Preservice Study was conducted through six university sites in four states. During the baseline phase of the study, novices received no intervention. During phase two of the study, one group of novices participated in a day-long problem solving workshop focused on helping participants think about and plan for learning needs of academically diverse learners. A second group of phase two novices took part in the same workshop and were then assigned a curriculum coach whose role was to continue to mentor their thinking about responding to academic diversity in their classrooms throughout their student-teaching placements. In the third phase of the study, a few novices from all three groups (no intervention, workshop, and workshop plus coach) were followed into their first year of full-time teaching. The study used both qualitative and quantitative design. All participants were observed at least three times during a given phase and interviewed after each observation. In addition, the novices and their cooperating teachers completed pre and post student-teaching surveys designed to assess their beliefs and practices related to academic diversity.

Key Findings From the Preservice Study

Findings from the study yielded a wide array of insights and implications for teacher educators as well as for public school leaders. Among many findings that merit consideration are the following:

- Novices in all three groups reported that they received little encouragement to differentiate instruction for academically diverse learners from their teacher education programs, university supervisors, or cooperating teachers. While the novices typically took a survey course on exceptional learners, they most often recalled the course to be an-exceptionality-a-week with little practical value in the field. Cooperating teachers often cautioned the novices to be sure to "keep all of the students together," even when the novices proposed more instructionally responsive plans.
- The novices' images of schooling were ill-suited to differentiating instruction. As they saw it, curriculum was about coverage with teachers telling and students absorbing and repeating information that is largely factual in nature. Everyone was allotted the same amount of time to complete

the same tasks. Assessment came at the end of learning to "see who got it." Grading was according to a standardized yardstick.

- Images of advanced or gifted learners and struggling or learning disabled/remedial learners were limited and limiting, and were often intertwined with compliance. Asked to describe advanced and struggling learners, the novices noted that gifted learners "do what I ask them to do" and "do it happily." Struggling learners misbehave, "can't stay on task," "don't want to work."
- The novices appeared to have a shallow well of instructional strategies from which to draw. Lecture and worksheets dominated. Even in the early grades, it was common for all learners to complete the same activities or learning centers.
- The single "alternative" instructional strategy common across many of the novices and sites was cooperative learning. The preservice teachers often spoke about cooperative learning in ways that clearly delineated the academic haves from the academic have nots, referring frequently to the students who "cannot learn" but who can at least be aided by the students "who already know it." A number of the novices discussed the benefits and relief they felt in having "junior teachers" to help them with their role as instructor.
- In the framework of overwhelming standardization in their images of schooling as well as in the realities of the classroom, the novices were frustrated by advanced and struggling learners. Gifted learners already know what is to be covered prior to instruction, "but they can't sit still, so I have to find fillers for them." Struggling learners "can't get it" in the time allotted, "but at least I expose them to it." There was a virtual absence of images of teaching in which there was more than a single "content," more than a single time allotment, or more than a single assessment, regardless of the diversity of the student population.
- Novices in the intervention groups persisted in their beliefs that learners vary in need and that an effective teacher will modify instruction based on those varying needs. Non-intervention novices, on the other hand, quickly jettisoned differentiation as a goal, often noting that it was unrealistic. Intervention novices also made more attempts to differentiate instruction than did their non intervention counterparts.

Some Implications From the Study's Findings

The role of a novice teacher is complex and demanding. In the virtual absence of either images of differentiated classrooms or persistent encouragement to develop the skills of differentiation, it was easy for the novice teachers in this study to succumb to the standardizing effects of schools. If we want to encourage novice teachers to move away from one-size-fits-all teaching, this study suggests that we will need to do a better job than we are currently doing, both at the university and public school level.

- Teacher education programs need to make differentiated instruction a key component of all pedagogical and practical experiences for all prospective teachers.
- Teacher education programs need to ensure that prospective teachers are developing the "gross motor skills" of teaching (e.g., understanding key concepts of a discipline, developing tasks that foster student meaning-making, teacher as facilitator, on-going assessment of student understanding, reflective practice) that are most likely later to lead to the "fine motor skills" of differentiation (e.g., creating tasks at varied levels of complexity, managing multiple groups in a classroom).
- Teacher education programs need to coach cooperating teachers in how to differentiate instruction (or at least the need to do so), so that the experienced teachers facilitate (or are at least open to) modifying instruction in ways responsive to academically diverse populations.
- Public schools need to establish for novices (and other staff) a core expectation that teachers appropriately address varied readiness levels, interests, and learning profiles in mixed ability classrooms.
- School leaders need to provide for novices in-school models of and coaching in creating and applying differentiated curricula, establishing and managing differentiated classrooms, flexible time use, alternative assessment, and grading patterns that support individual growth.
- Public schools need to provide novice teachers help in establishing reasonable long and short term goals for professional growth, consistent encouragement and support in achieving the goals, and recognition of growth throughout the early stages of teacher development.

The Preservice Study indicates that if the needs of academically diverse learners, including the gifted, are to be met in the regular classroom, much work needs to be done with preservice level teachers. We must establish a sense of need for teachers to be responsive to varied learner needs, perceptions and practices related to curriculum and instruction. This, of course, will require prolonged support and commitment at the university and school levels for long-term development in differentiation.

Total School Cluster Grouping: An Investigation of Achievement and Identification of Elementary School Students

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CLUSTER GROUPING OF students for instructional purposes is a programming strategy that can be used to meet the needs of high achieving and gifted students in the regular classroom. It has gained popularity in recent years due to heterogeneous grouping policies and financial cutbacks that have eliminated special programs for gifted and talented students (Purcell, 1994). Cluster grouping has been defined as the intentional placement of a group of high achieving or gifted students in an otherwise heterogeneous classroom with a teacher who has both the background and willingness to provide appropriate challenges for these students (McInerney, 1983). Research indicates three major benefits exist to cluster grouping. First, gifted students interact with their intellectual peers as recommended by Rogers (1991), as well as their age peers on a regular basis. Second, cluster grouping provides services for gifted students without additional cost to the school district. Third, recent research has demonstrated that cluster grouping facilitates ongoing programming for gifted or high achieving students in the regular classroom (Hoover, Sayler, & Feldhusen, 1993).

This study examined the effects of a cluster grouping program on the identification and achievement on students in a small, rural, mid-western school district that was purposefully selected because of its innovative use of cluster grouping. Cluster grouping in this district begins in grade 3 and continues through grade 5, with a yearly, flexible identification process beginning at the end of second grade that includes information from teachers, parents, and achievement tests. Within this program, some students are identified on the basis of their academic achievement and performance as *high achieving,* and placed together in a classroom with a teacher who modifies curriculum and instruction to meet the academic needs of these students. Other students are identified as *above average, average, low average, low,* or *special education* for placement in heterogeneous classrooms, in which students are flexibly grouped and regrouped for instructional purposes. There are five classrooms per grade level and each year one classroom has the cluster of high achieving students, with the remainder of this class comprised of average, low average, and low achieving students. The other four classrooms each have a heterogeneous mix of students who achieve at above average, average, low average, and low levels. Additionally, two of these classrooms have clusters of special needs students who receive Title 1 assistance in math and reading, or who receive assistance from a special education teacher-consultant. By arranging classes in this manner, each heterogeneous classroom has a group of above average achieving students, and the use of resource personnel is maximized.

Background of the Study

General Background

Several analyses of studies regarding ability grouping in elementary schools (Kulik, 1992; Kulik & Kulik, 1984, 1985, 1992; Rogers, 1991; Slavin, 1987) have been completed; however, only six studies could be located that examined the effects of ability grouping on gifted students in schools that used a cluster grouping model (Hoover et al., 1993; Ivey, 1965; LaRose, 1986; Long, 1957; Simpson & Martinson, 1961; Ziehl, 1962). All of these studies were concerned with the effects of cluster grouping on gifted students, and none examined the effects on students of other achievement levels. Additionally four of these studies are over 30 years old and may not apply to current educational settings. Cluster grouping is commonly suggested as a programming option for gifted students (Balzer & Siewert, 1990; Brown, Archambault, Zhang, & Westberg, 1994; Davis & Rimm, 1985; Kulik & Kulik, 1991; LaRose, 1986; McInerney, 1983; New York State Dept. of Education, 1982; Renzulli, 1994; Rogers, 1991; Winebrenner & Delvin, 1991) when, in fact, very little evidence exists regarding its impact on these students, and no existing research examines the impact of cluster grouping on all students (Hoover et al., 1993). It is surprising that since so many professionals advocate the use of cluster grouping, so little research actually exists regarding its effectiveness. A need clearly exists for empirical and qualitative evidence concerning the effects of cluster grouping, not only on high achieving students, but on other students as well.

Rationale for Cluster Grouping

The rationale for the total school cluster grouping used by the school that this study investigated is based upon the following issues discussed in the literature:

- *The program is cost effective.* Cluster grouping often exists in schools which can not afford additional personnel for a gifted and talented program. Hoover et al. (1993), LaRose (1986), Rogers (1991), Rogers and Span (1993), and Winebrenner and Delvin (1991) suggested that cluster

grouping can be a solution when other programs are not affordable.

- *Students are clustered with their intellectual peers.* Rogers (1991) concluded, in her meta-analysis, that gifted students should spend the majority of their school day with students of similar abilities. Research by Schunk (1987) has shown that students learn from those who are like themselves in ability. Kulik and Kulik (1991) concluded that it is beneficial, with respect to achievement gains, for gifted students to be grouped together.
- *Special needs students and the highest achieving students are placed with teachers who have had training and are interested in meeting these special needs.* Kulik and Kulik (1984) noted that the greatest benefit for ability grouped gifted children occurred when there was curricular differentiation. Rogers (1991) noted that without training and commitment to providing appropriately challenging curricula, achievement gains would probably be insignificant.
- *The highest achieving students are removed from other classrooms, thereby allowing new leaders and achievers to emerge.* Kennedy (1989) studied the effects of gifted pull-out programs on the students who remained in the regular classroom, and found that achievement increased in the classroom when the gifted students were pulled-out for programming. Contrary to Oakes' (1985) assertion that grouping harmed lower ability students, Kulik and Kulik (1992) and Rogers (1991) found no such evidence.
- *Heterogeneous grouping is maintained while there is a deliberate reduction in the range of achievement levels that each teacher must teach.* In this program, grouping within the classrooms was flexible as recommended by Renzulli (1994) and Slavin (1987). Students interacted with both intellectual and age peers on a continual basis, identification categories were used for placement, and teachers had a limited range of achievement levels in their classrooms.
- *More efficient use of special education and Title I personnel is achieved by creating clusters of these students in one or two rooms instead of spreading them across five rooms.* This allowed team teaching between teacher consultants, aides, and classroom teachers, while providing targeted students with more time with specialists.
- *A high achieving group of students exists in every teacher's classroom.* Kennedy (1989) found that low and average ability students flourish when gifted students are not present and leading the competition in the regular classroom and Schunk (1987) indicated average and low ability students use children of similar ability as models instead of high ability children. By placing the highest achievers in a single room and above average students in the other classrooms, all students had the opportunity to grow.
- *High expectations for all students are maintained across all classrooms.* In her meta-analysis of research related to teacher expectations, Smith (1980) found that teacher expectations were linked to student learning, attitudes, and achievement. In addition, Brophy and Good's (1970) self-fulfilling prophecy model explained that students who are expected to achieve at high levels will do so, and conversely, students who are expected to achieve at low levels will not achieve at high levels.

Research Questions

Since 1988 when a cluster grouping program was implemented in the treatment school, a trend regarding the identification of students was observed by the program coordinator, district administrators, and teachers. Specifically, during the 3 years that students spent in the school cluster grouping program, more students were identified by teachers as high achieving or above average and fewer students were identified as low or low average. This trend, together with the paucity of research on cluster grouping, lead to the following research questions:

1. Does a cluster grouping program affect teacher perceptions of student achievement as measured by teacher identification categories?
2. How do students in the cluster grouping school compare with students from a similar school who are not involved in cluster grouping with regard to achievement?

Methods and Procedures

Research Design and Sample

This study employed an ex post facto examination of quasi-experimental, non-equivalent comparison group intervention which used a purposive sample. The treatment sample included all students from the Class of 2000 (N=96) and Class of 2001 (N=104) from a small rural school district. These students were involved in the program from grades 2 through 5 that allowed for an examination of the program effects over time. A comparison school was selected on the basis of its similarity to the treatment school with regard to: geographic region, socioeconomic status, ethnicity, and school configuration and size. The

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comparison district did not have a program for gifted students, and made available for research student achievement data [Class of 2000 (N=68); Class of 2001 (N=69)].

Instrumentation

Student achievement in the treatment school was measured on a yearly basis using the *Iowa Tests of Basic Skills* (*ITBS*). The *ITBS* is a nationally recognized achievement assessment of the highest quality. For Form G, internal consistency and reliability coefficients are in the expected range of mid .80's to low .90's and stability reliabilities with a one year interval are in the .70 to .90 range (Willson, 1989).

The comparison school measured student achievement on a yearly basis using the *California Achievement Test* (*CAT*). The *CAT* is well constructed, current, and well documented with internal consistency reliabilities in the high .80's and low .90's and stability reliabilities in the .80 to .95 range (Airasian, 1989). Additionally, Airasian stated the *CAT* "compares very favorably to other achievement batteries of its genre such as. . .the *Iowa Tests of Basic Skills*" (p. 128). Thus, while the content of these two standardized tests is not identical, use of Normal Curve Equivalent (NCE) scores provided an achievement standing relative to the respective test's norm in a group.

Data Analysis

Data were analyzed using descriptive statistics (means, frequencies, and percents) and repeated measure analyses of covariance using grade 2 as the covariate to equate the groups for initial differences.

Results

To address research question one, data were collected on the yearly student identification categories (*high achieving, above average, average, low average, low,* or *special education).* During the three program years, 48% of the students from the Class of 2000 and 33% of the students from the Class of 2001 were identified as achieving at increased levels. The types of changes in identification categories are indicated in Table 1 and Table 2.

Additionally, the number of students identified as *high achieving* increased each year. For the Class of 2000, there were 10 third grade students identified as *high achieving,* but 23 students were identified as *high achieving* when they were in fifth grade. Further, for the Class of 2001, the number of students identified as *high achieving* grew from 15 to 23 between grades 3 and 5. For both of these classes of students, the number of students identified as *low* or *low average* decreased during the 3 program years.

Table 1
*Class of 2000: Changes in Identification Categories Over Three Program Years**

Identification Change	Percentage of Students
Category increased	48
Category decreased	2
No change (regular education)	31
No change (special education)	9
Other changes (high-low-high, or low-high-low)	9
Total	99

Note. N=96, total may not equal 100% due to rounding.
*Categories were: *high achieving, above average, average, low average, low,* or *special education*

Table 2
*Class of 2001: Changes in Identification Categories Over Three Program Years**

Identification Change	Percentage of Students
Category increased	33
Category decreased	9
No change (regular education)	42
No change (special education)	6
Other changes (high-low-high, or low-high-low)	11
Total	101

Note. N=104, total may not equal 100% due to rounding.
*Categories were: *high achieving, above average, average, low average, low,* or *special education*

To address research question two, the achievement scores from students who attended the treatment school were compared with achievement data from students who attended the comparison school. The NCE scores for each student on the total battery (*ITBS*: treatment; *CAT*: comparison) were used in two repeated measures analyses of covariance, one for the Class of 2000 and one for the Class of 2001. Students were statistically equated on achievement using the grade 2 scores as the covariate (significant covariate at $p<.05$). Adjusted and unadjusted means are displayed in Table 3. The results indicated that there were significant interactions between group and total battery NCE scores for the Class of 2000 ($F=(2,304)$, $p<.01$) and for the Class of 2001 ($F=(2,334)$, $p<.01$). Effect Sizes of .14 and .10, respectively, indicated that the results are practically significant (Cohen, 1985). Interaction plots of adjusted means are depicted in Figures 1 and 2.

Table 3
Unadjusted and Adjusted Means for NCE Total Scores Grades 3 through 5 for the Class of 2000 and Class of 2001

	Class of 2000				Class of 2001			
Grade	Treatment		Comparison		Treatment		Comparison	
	UnadjM	AdjM	UnadjM	AdjM	UnadjM	AdjM	UnadjM	AdjM
3	49.9	52.5	53.6	50.3	46.7	47.1	52.9	52.3
4	51.2	54.2	51.4	48.1	50.4	50.7	50.9	50.3
5	54.3	57.0	47.4	43.8	52.4	52.8	49.3	48.8

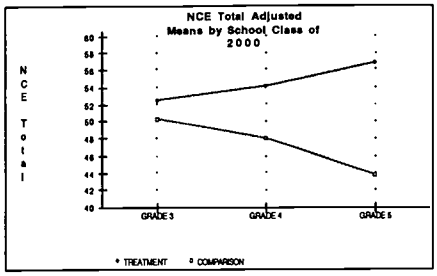

Figure 1. Interaction of NCE total scores by school for the Class of 2000.

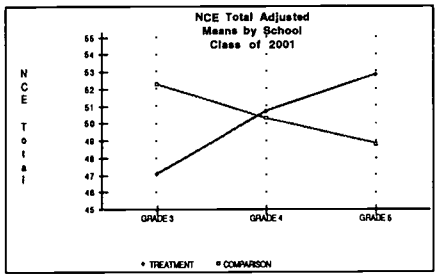

Figure 2. Interaction of NCE total scores by school for the Class of 2001.

Discussion

During the 3 years that students were involved in the cluster grouping program, their achievement increased significantly when compared to similar students from a school that did not use cluster grouping. Additionally, during each of the 3 years of the program, more students were identified by teachers as high achieving, indicating that not only were achievement scores increasing, but that teachers were identifying students who were not initially recognized as high achieving. This may be due to the fact that high achieving students were clustered in one classroom, thereby allowing students in other classrooms to be recognized as high achieving. It is encouraging that not only did the identification categories of many students increase during the 3 program years, but that this was followed by an overall increase in achievement as measured by the *Iowa Tests of Basic Skills*.

The implications are that when a cluster grouping model is implemented, there may be a positive effect on the achievement and identification of all students, not just those identified and placed in the cluster for high ability students. According to the model in the treatment school and the review of literature, this is most likely when teachers have training in tailoring curriculum and instruction to the individual needs of students and when teacher expectations are high for all students.

This study provides a basis for further, controlled research regarding the effects of cluster grouping on the achievement and identification of students. A follow-up investigation will be conducted into the classroom practices of the teachers involved in this program.

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Valuing, Identifying, Cultivating, and Rewarding Talents of Students From Special Populations

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IN OUR SOCIETY, WHICH IS far from uniform in its beliefs and values, reaching consensus regarding who is gifted is complicated, and identifying potentially gifted students can be ambiguous at best. The differences in cultural norms, languages, ethnic backgrounds, levels of education and income, and other differences, raise a number of issues with respect to what talents are valued, identified, cultivated, and rewarded.

The challenges of identifying gifted students from underrepresented or special populations is not new. For decades, issues were raised concerning the identification of gifted children from lower socioeconomic classes. Since World War II and especially since school desegregation, there has been a recognition that the traditional approaches to identifying gifted children have been inadequate and that the considerable talent potential among minority and economically disadvantaged students has gone undeveloped (Frasier, Garcia, & Passow, 1995). Gifted children with disabling conditions are also underserved and underrepresented in gifted and talented programs (Willard-Holt, 1994). Therefore, identifying and serving gifted students from racial and ethnic minority groups, economically disadvantaged students, students with limited English proficiency, and students with disabilities is a priority in the Javits Gifted and Talented Students Education Act of 1988.

This section focuses on the reasons for the underrepresentation of students from special populations in gifted and talented programs and the proposals to deal with improving this problem.

Cultural and Ethnic Groups

People who live in the inner city, in the barrio, or on the reservation need to know that their children are gifted. There's too much raw ability going through the cracks. If a child we might lose had the ability to cure cancer but ends up joining a gang or dealing dope, that's a double loss to the country. (Ryan, 1983)

Over the years, numerous writers have observed that gifted children can be found in every level of society and in every cultural and ethnic group (Clark, 1993; Ford, 1994; Renzulli, 1973; Torrance, 1977). Yet, identification of students with learning or physical disabilities and those from different cultural and ethnic groups has not been in balance with their numbers in the school population.

By far, underrepresentation of cultural and ethnic participation in programs for the gifted is most frequently attributed to biases in standardized testing (Bernal, 1980; Richert, 1987, 1991). Charges of test bias may stem from the test's content and format, performance differences among groups, and the purposes for which the test results are used. However, there is some agreement (Anastasi, 1988; Kamphaus, 1993; Reynolds & Kaiser, 1990; Thorndike & Lohman, 1990) that there is little or no substantiating evidence in the claims of bias in most well-constructed modern tests of intelligence.

Charges of bias extend beyond the test's content and format. A number of others criticize the fact that testing instruments and practices developed in Euro-American tradition are invalid measures for other minority group children (Boykin, 1986; Hilliard, 1991). In any event, discussions and disagreements about test bias will continue as long as standardized tests remain a dominant part of assessment and identification.

Another area of concern regarding assessment and identification of children from cultural and ethnic groups is in the referral process. It has long been recognized that minority students are simply not referred for programs for the gifted to the same extent as majority students. Factors contributing to the underreferral of these students are teacher attitude and the type of school these students are likely to attend (High & Udall, 1983). Research indicates that students, teachers, and school professionals continue to have low academic expectations for culturally and linguistically diverse students (Jones, 1988). With low expectations, teachers tend to overlook these students when making referrals for gifted program screening.

The traditional focus on deficiencies rather than on strengths is another reason for the low participation of students from cultural and ethnic groups in gifted programs. Since the 1950s and 1960s, with the emergence of school desegregation, civil rights activities, and the war on poverty, cultural deprivation became the driving theme for research. Identifying the knowledge, skill, and attitude deficiencies of ethnic students, and designing activities to eliminate or reduce them became the main focal points. This focus has made it difficult to recognize the strengths of these children, and has been criticized because it has diverted attention away from students who have achieved, despite the characteristics of cultural differences (Frasier, Garcia, & Passow, 1995).

Physical and Learning Disabilities

A major portion of their time is often spent in remediation or learning to circumvent the effects of the disability. This concentration on the child's disability may preclude the recognition and development of cognitive abilities. (Karnes & Johnson, 1991)

Identification of students with specific physical disabilities can be problematic. Children whose speech and language are impaired cannot respond to tests requiring verbal responses. Children with limited mobility may be unable to take nonverbal or "performance" tests requiring hand manipulation. In addition, limited life experiences due to impaired mobility may artificially lower scores. Another problem is that gifted children try to compensate for their weaknesses, and children with disabilities often hide special abilities in order to fit in. This combination may cause them to appear closer to average in both areas (Hemmings, 1985), and be overlooked for placement in gifted programs.

Problems inherent in the identification of gifted students with learning disabilities can be grouped into four categories (Whitmore & Maker, 1985). The first has to do with stereotypical expectations about gifted children. Although most of the old images of the gifted child as a weakling wearing thick glasses are gone, stereotypes remain, such as, the gifted are always mature, self-directed, and well behaved in the regular classroom. The second category includes developmental delays. Some disabling conditions can produce delays in specific developmental abilities that are often used as indicators of giftedness. While developmental delays may hinder intellectual aptitude, they are not necessarily indicators of cognitive inability.

The third obstacle to identification includes incomplete information about the child which limits the view of the child's potential. Educators are usually not provided with detailed information about the characteristics of high ability students with learning disabilities. This may cause the classroom teacher to concentrate on disruptive behaviors and learning deficits instead of the child's talents (Cramond, 1995; Reis, Neu, & McGuire, 1995).

The last category of obstacles to identification relates to existing programs for students with learning disabilities. In programs for children with learning disabilities, students are rarely provided with opportunities to display their talents. There is little information about enrichment programming for bright students with learning disabilities.

The problem of identification is further compounded by the absence of procedures to locate these students within most public schools. The identification of high ability students with learning disabilities is a rarity in school professional development programs, therefore, there is a general lack of awareness regarding the phenomenon of gifted students with learning disabilities (Boodoo, Bradley, Frontera, Pitts, & Wright, 1989).

Assessment and Identification Issues

Cultural and Ethnic Groups

The use of multiple criteria and nontraditional measures figures prominently in many of the proposals to improve the identification and consequent representation of gifted students from minority populations. (Frasier, Garcia, & Passow, 1995)

Assessment issues related to the identification of gifted children from different cultural and ethnic groups highlight the difficulties with traditional methods in recognizing the talents of students from diverse groups (Callahan & McIntire, 1994). Various researchers have offered a range of possible ways of increasing effective identification procedures. They include: developing new data matrices; renorming or redesigning standardized tests; creating more authentic evaluation procedures such as portfolios or performance assessment; using objective and subjective data from multiple sources; extending the range of persons in the referral and nomination process, which involves creating enriched learning opportunities so students can demonstrate their abilities; adjusting cutoff scores and analyzing subtest scores differently; and developing culture-specific checklists and rating scales (Frasier, Garcia, & Passow, 1995; Lidz, 1991).

There are many difficulties inherent in these proposals. There are claims that some of these nontraditional, nondiscriminatory forms of assessment may actually provide invalid information (Hilliard, 1991). Others argue that "doctoring" measurement techniques by adding points stigmatizes these children, while failing to recognize their many gifts (Bernal, 1980). Lastly, summing scores from different tests, scales, and checklists is considered statistically inappropriate (Pendarvis, Howley, & Howley, 1990).

The long-standing debates related to the identification of talent potential among this population will, no doubt, continue for some time. There is no single new assessment procedure that will fix all the problems associated with assessment and identification of these children. Among the areas that research can profitably address are in the development of a consensus on the construct of giftedness and in the exploration of the value and validity of data from multiple sources.

Clearly, new models for identification that will include populations that have not been adequately identified are needed (Frasier & Passow, 1994). The promise is that educators will better

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understand how to identify and nurture talent potential among all learners.

Students With Physical and Learning Disabilities

Intellectually gifted individuals with specific learning disabilities are the most misjudged, misunderstood, and neglected segment of the student population and the community. (Whitmore & Maker, 1995)

There are three areas educators can address which relate to recognizing talent in students with physical and learning disabilities. They include: the difficulty in expressing and recognizing talent, the impact of the classroom atmosphere, and integration into the regular classroom (Cramond, 1995; Reis, Neu, & McGuire, 1995; Willard-Holt, 1994). First, there are a variety of measures which may be used to assess the cognitive abilities of students with physical limitations. Standardized tests include the *Columbia Maturity Test*, *Detroit Test of Learning Aptitude-2*, and the *Stanford-Binet*—to name just a few. Certain adaptations and modifications may be necessary, not to make the test easier, but to make it possible for students to demonstrate their abilities.

The difficulty in recognizing indicators of giftedness may be reduced with informal measures such as observational checklists of characteristics of gifted children and those specific to gifted students with various disabilities. Recognizing and nurturing talents in children who are unable to speak is extremely difficult. These children cannot explain their thinking processes, respond to or ask questions, or display leadership abilities in conventional ways. They must rely on others or on mechanical devices to interpret for them.

The second area of focus involves the classroom. The classroom atmosphere, its structure, and the instructional activities offered greatly impact the intellectual development of gifted students with physical disabilities. A positive atmosphere, where students with physical abilities are respected, facilitates their development. Classes that are structured for individualization, advanced work, and an emphasis on achievement tend to be the best suited for these students. Hands-on activities such as science experiments and field trips are valuable in building tactile experiences not often encountered by students with physical disabilities.

The last area involves integration into the regular classroom. Gifted students with physical disabilities need a

mainstreamed setting with opportunities to interact with nondisabled peers. Spending more time with nondisabled students helps them to learn adaptive behaviors more quickly. They also should be given access to gifted programs in their schools.

In addition, there are various measures to enhance the identification of students with specific learning disabilities other than those which are physical. A substantial amount has been published about various traits or characteristics which hamper the identification of high ability students with learning disabilities. Practitioners interested in this population have also identified positive characteristics which can aid educators and parents in recognizing the talents of these students (Reis, Neu, & McGuire, 1995).

These lists of characteristics may help rid the stereotypes which still remain about the gifted child, and allow educators to look beyond disruptive behaviors and learning deficits, toward the talents the child may have. In order to do this, however, professional development programs are imperative for classroom teachers who often find it difficult to recognize giftedness in one area when the same student is having difficulties in other areas.

Finally, instructional strategies which avoid drill and practice, but provide special enrichment activities which develop creative abilities are a few of the many recommendations offered by experts interested in high ability students with learning disabilities. These recommendations are consistent with the overall recommendations offered by experts in the field of gifted and talented education (Baum, 1984). The key to addressing students with disabilities lies in getting beyond the specific disability while allowing the cognitive talents to blossom.

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The National Research Center on the Gifted and Talented welcomes the following new Collaborative School Districts:

Alaska Gateway School District
Tok, Alaska

Akron Public Schools
Akron, Ohio

Dublin City Schools
Dublin, Ohio

The *NRC/GT Newsletter* is published by The National Research Center on the Gifted and Talented, University of Connecticut. The Research Center is supported under the Educational Research and Development Centers Program, PR/Award Number R206R50001, as administered by the Office of Educational Research and Improvement (OERI), U. S. Department of Education.

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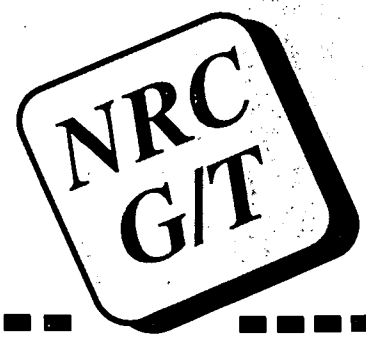
1996 Winter Newsletter



University of Connecticut
City University of New York, City College
Stanford University
University of Virginia
Yale University

What You'll Find In This Issue...

NRC/GT Through the Year 2000

E. Jean Gubbins
University of Connecticut
Storrs, CT

THE RESEARCH AGENDA for The National Research Center on the Gifted and Talented (NRC/GT) will continue through the Year 2000. In October 1995, the United States Department of Education, Office of Educational Research and Improvement (OERI), awarded a five-year cooperative agreement to the University of Connecticut. The consortium of the University of Connecticut; City University of New York, City College; Stanford University; University of Virginia; and Yale University will extend and enhance our focus on critical issues in the field of gifted and talented education. Funding for the cooperative agreement is under the Jacob K. Javits Gifted and Talented Students Education Act of 1994. The legislation focuses on identifying and serving students who have traditionally been underrepresented in programs for the gifted and talented, including individuals who are economically disadvantaged, individuals with limited English proficiency, and individuals with disabilities.

During the first five years of the NRC/GT (1990-1995), principal investigators planned the Year 1 studies. Subsequent studies initiated in Years 2-5 emerged from the results of the national research needs assessment survey (Reid, Renzulli, & Gubbins, undated). With the new award, OERI outlined several topics to be addressed through the proposed research. These topics included:

- identifying, teaching, and serving gifted and talented students;
- improving the education of gifted and talented students who may not be identified and served through traditional assessment methods and programs;
- using knowledge and experience gained in developing and implementing gifted and talented programs and methods to serve all students; and
- understanding the effects of gifted education programs on the educational achievement of students schoolwide.

The topics cited by OERI reflect several of the research priorities from the national needs assessment. Since the completion of the survey in 1991, we have revisited and updated the priorities with our advisory panel and consortium members. The major priorities that emerged from the needs assessment are addressed in our proposed research agenda for 1995-2000. The priorities include: (1) identifying, teaching, and serving gifted and talented students with known and emergent talents; (2) developing effective professional development techniques to improve the nation's ability to work with students with high abilities; (3) creating alternative approaches to recognizing and nurturing talents and abilities of students who have been underserved in the past; and (4) applying the pedagogy of gifted education to all students.

Abstracts of the research proposals for 1995-2000 follow.

Maximizing the Effects of Professional Development Practices to Extend Gifted Education Pedagogy to Regular Education Programs

Karen L. Westberg
Deborah E. Burns
E. Jean Gubbins
Sally M. Reis
University of Connecticut
Storrs, CT

Several studies conducted by The National Research Center on the Gifted

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and Talented (NRC/GT) have pointed out that classroom teachers have limited exposure to professional development practices regarding new techniques and new strategies associated with gifted education pedagogy. Given that classroom teachers often have the primary responsibility of meeting the needs of talented students in their classrooms, it is important to gather specific data on how the whole process of professional development in gifted education is addressed. In this five year study, a national survey of approximately 4,300 districts will be conducted during 1995-1996 (Year 1) to determine the purpose, scope, and content of professional development practices in gifted education.

In subsequent years, we will experiment with existing professional development modules on curriculum compacting, thinking skills, curricular options for high-end learning, and enrichment clusters to determine their effectiveness in providing administrators and teachers with theoretical and practical knowledge, skills, and model activities to meet the needs of talented students. We also will develop a new module on enrichment learning and teaching to help teachers apply gifted education pedagogy in regular classrooms.

Applying the Triarchic Theory to Ethnic Minority High School Students

Deborah L. Coates
City University of New York, City College
New York, NY

Students from Hispanic and African origin backgrounds are often underrepresented in programs for the gifted and talented and in higher education programs in mathematics and science. Reasons for such underrepresentation are complex and may include test performance, economic disadvantage, and educational practices. Sternberg (1985) developed a theory of intelligence responsive to the diversity of intellectual abilities that addresses issues of identification, instruction, and assessment. The application of Sternberg's theory will be studied. The purposes of the intervention will be: (1) to use the triarchic method of assessment and teaching to identify undiscovered gifted students among ethnic minority group students; (2) to use innovative strategies to teach high school students to use thinking skills based on the triarchic model; and (3) to develop supportive mechanisms to sustain the thinking skills.

Identifying, Teaching, and Evaluating the Talented Through Linguistic and Cultural Lenses

Shirley Brice Heath
Guadalupe Valdés
Stanford University
Stanford, CA

Oftentimes the identification of talents among young people is confined to the school environment. It is important, however, to go beyond school walls and consider and understand the recognition, nurturance, and application of talents. Students within and outside of school will be identified who exhibit talents for leadership, translation and interpretation, resilience, and teaching/demonstration.

Several populations will be the focus of using linguistic and cultural lenses to identify, teach, and evaluate talented students. The populations will include:

- Latino students in a middle-class community high school;
- Latino youth in community-to-school programs;
- White and Native American/Indian youth involved in community development and entrepreneurship in impoverished counties;
- African American youth in performing arts programs in urban centers; and
- Immigrant, local, and "sent up" youth (from juvenile detention centers) in rural comprehensive schools and county youth programs.

The Feasibility of High-End Learning in the Diverse Middle School

Carolyn M. Callahan
Carol A. Tomlinson
Tonya R. Moon
Donna Ford-Harris
Ellen Menaker Tomchin
University of Virginia
Charlottesville, VA

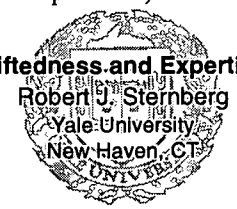
How can all learners, including gifted, minority, and limited English proficient students be appropriately served in a strong middle school environment? This study is designed to test the viability and impact of bringing together leaders and practitioners of middle school and gifted education to develop, execute, and test models of curriculum differentiation and alternative assessment strategies. One approach will focus on introducing a model of curriculum differentiation in a heterogeneous classroom, focusing on high-end learning. The second approach will investigate ways teachers use classroom performance assessments to evaluate and assess multiple levels of student achievement in heterogeneous classrooms. It also will assess the impact of using these strategies on instruction, student attitudes, and achievement.

Modern Theories of Intelligence Applied to Assessment of Abilities, Instructional Design, and Knowledge-Based Assessment

Robert J. Sternberg
Yale University
New Haven, CT

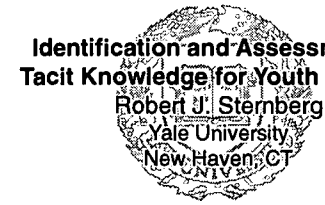
The effects of instructional strategies on gifted students based on Sternberg's (1985) triarchic theory of intelligence will be examined in grades 4, 7, and 10 in language arts, math, science, and social studies. According to the triarchic theory, intelligence has three aspects: memory-analytic, creative-

synthetic, and practical-contextual. The principal research question is whether the triarchic theory of intelligence can inform identification, instruction, and assessment. To test this question and others, three treatments are proposed: (1) standard instructional regimen, emphasizing recall learning, but also incorporating thinking skills; (2) standard instructional regimen, but also emphasizing critical (analytical) thinking; and (3) instructional regimen infused with triarchic (analytical, creative, and practical) thinking.



Potential and performance have long been sources of discussion and reflection among educators who seek to identify and serve students' emergent or recognized giftedness. The types of abilities and skills identified among young children may not be predictors of adult giftedness. This study of giftedness and expertise will compare the relative importance of reasoning ability (as measured by psychometric tests) and of deliberate practice in achieving expert levels of achievement through a computer related task requiring complex reasoning. Gifted students will serve as the expert group and nongifted students will be the novices involved in prototypical and novel tasks.

The expert task performance of established adult leaders in English, mathematics, history, and biological science also will be examined to set the stage for comparing and contrasting the expert and novice states for student and adult performers. Knowledge gained from these strategies will be used to create and validate an assessment tool that measures what is required for expert studentship and transition into expertise in a discipline.



When we think about giftedness, we often think about academic giftedness and occasionally about musical or athletic giftedness. At least as important, however, is giftedness in leadership. This aspect of practical intelligence is critical. In this collaborative effort with Shirley Brice Heath of Stanford University, we will identify the tacit knowledge (i.e., knowledge that is not openly expressed or stated) needed for success in youth leadership; and develop a separate instrument to measure tacit knowledge for youth leaders. Youth leaders will be interviewed and observed to provide preliminary information for a measure of tacit knowledge. The inventory will then be subjected to validity and reliability procedures to ensure its usefulness as a measure of identification and assessment of tacit knowledge for youth leadership.

This five-year research agenda of The National Research Center on the Gifted and Talented focuses on large scale, basic research accomplished through surveys and small to medium scale, applied research in classrooms. We will, once again, call upon our Collaborative School Districts in every state and two territories (Guam; Virgin Islands) to participate in these studies. The specific responsibilities of Collaborative School Districts are:

1. To serve as locations at which research data can be gathered;
2. To provide locations where visitations can be arranged to observe successful practices in operation, to participate in the preparation of consumer-oriented guidebooks and video training tapes, and to provide technical assistance to school districts that express an interest in replicating successful practices; and
3. To assist in the documentation of biographical information about students so that contacts can be maintained for longitudinal follow-up studies.

Districts will benefit from the opportunity to:

1. Receive announcements of materials and staff development opportunities for teachers and students;
2. Participate in experimental curriculum;
3. Network with other school districts throughout the country;
4. Access the NRC/GT's WWW site for the latest research;
5. Receive copies of the NRC/GT newsletters summarizing the latest research activities;
6. Provide guidance and direction for the establishment of state and national policies for gifted and talented education; and
7. Access copies of all products produced by the Center on a cost-recovery basis.

Since Spring 1995, two districts (Suffield Public Schools, Suffield, CT: Laurence Public Schools, Laurence, NY) have joined our network now totaling 339. We would like to extend an invitation to other districts to become a Collaborative School District. Just contact us at the NRC/GT address on the back of this newsletter and we will send you a demographic profile and other pertinent information. We are especially interested in expanding our network in several states and territories, including North Dakota, South Dakota, Idaho, Nevada, New Mexico, Arizona, Utah, Oklahoma, Hawaii, Louisiana, Tennessee, Wyoming, Alabama, Ohio, West Virginia, Alaska, Delaware, Rhode Island, Puerto Rico, and American Samoa. Although we have

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representation in all of the states, we would like access to more school districts, and we are interested in working with the territories.

We are excited about our research plans and will continue to share our progress with you through our semi-annual newsletters and other publications from the NRC/GT. Thank you for all of your support and continued interest in our work.

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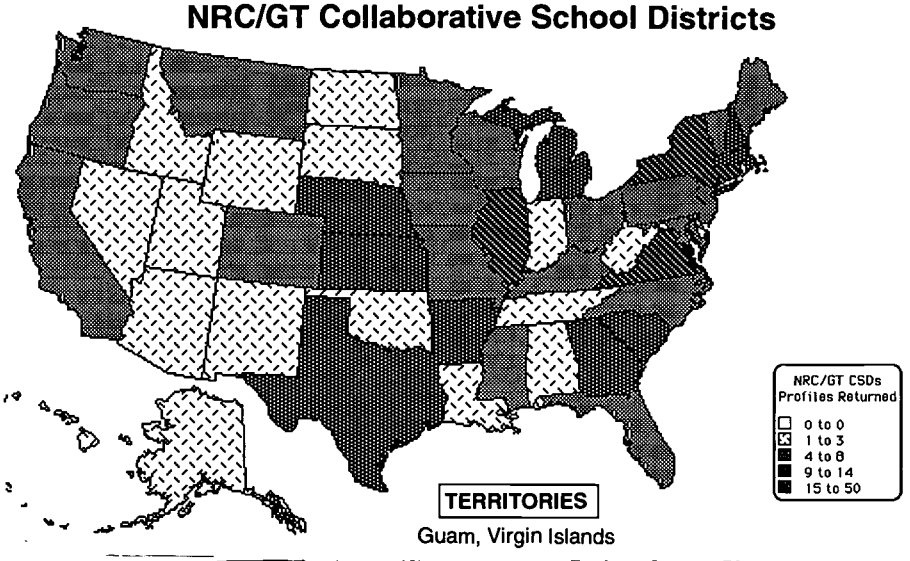
NRC/GT Collaborative School Districts



New Collaborative School Districts

Suffield Public Schools – Suffield, CT
Laurence Public Schools – Laurence, NY

NewsBRIEFS

Complete listings of NRC/GT publications and abstracts of selected publications are now available from our World Wide Web site at the University of Connecticut. Any computer user with access to the Internet can access this service. Our address is "www.ucc.uconn.edu/~wwwgt".

* * *

Legal issues in gifted education continue to be of interest to parents, teachers, school administrators, and concerned citizens. Dr. Frances Karnes is collecting information on court cases and due process hearings. If you have such information from your state, contact her at the University of Southern Mississippi, Box 8207, Hattiesburg, MS 39406-8207.

* * *

A new guide to help teachers develop more authentic instruction, assessment, and student performance is available from the Wisconsin Center for Education Research. Authors Fred M. Newmann, Walter G. Secada, and Gary G. Wehlage base their suggestion on studies of 24 restructured elementary, middle, and high schools nationwide. The $9.00 guide is available from Document Service, Wisconsin Center for Education Research, 1025 W. Johnson Street., Room 242, Madison, WI 53706, phone (608) 263-4214.

* * *

Genesis: Breathing Life into Learning through the Arts, a three-day working conference for teachers, artists, and administrators, will be held on the University of Montana campus in Missoula on June 19-21, 1996. Featured presenters include Howard Gardner, Mihaly Csikszentmihalyi, David O'Fallon, and Mary Clearman Blew. A $110 pre-registration is required and enrollment will be limited. For information contact: The Creative Pulse, UM School of Fine Arts, University of Montana, Missoula, MT 59812, phone (406) 243-4970.

* * *

A new book by Robert Abelman examines television-related issues pertinent to children in general and intellectually gifted kids in particular. *Reclaiming the Wasteland* offers parents and teachers a prescription for accentuating the positive and avoiding the negative outcomes of children's television viewing. Paperback copies of *Reclaiming the Wasteland* may be purchased for $18.95 plus $3.50 postage and handling from Hampton Press, 23 Broadway, Suite 208, Cresskill, NJ 07626, phone 800-894-8955, fax (201) 894-8732.

* * *

School reformers and curriculum designers may find their efforts to shake up schools complicated by the way in which secondary school teachers view the subjects they teach. A study published in the November 1995 issue of *Educational Researcher*, a journal of the American Educational Research Association, indicated that math and foreign language teachers rated their subjects as significantly more sequential and more defined than did teachers of science, English, and social studies. These findings suggest that teachers work in contexts defined by the subject matter they teach.

NEWSBriefs

Still Searching...

Julie D. Swanson
College of Charleston
Charleston, SC

"The journey is the reward."
Peter Senge, 1990

EARLY ON, A TEACHER OF the gifted imparts to his/her students the idea that there are many approaches to solving a problem and many right answers for most questions. As teachers of the gifted, we often emphasize the *process* of learning with our students, rather than focus on the end product. However, when we conduct research projects, we usually take an opposite tack. We focus on the end product, the final results of the research project, rather than extrapolating lessons throughout the project's life. This article relates the story of a different, more reflective view of one such research project. What follows is a description of the process of searching for answers, the journey of tackling an issue about which one cares deeply, and what is gained through the process.

Background

Funded in September 1992 by the Jacob K. Javits Gifted and Talented Students Education Act, Project SEARCH, Selection, Enrichment, and Acceleration of Rural Children, had two major goals similar to a number of other Javits projects. The first was to develop a method of identification for gifted students who were underrepresented in our pilot schools: students who were poor, rural, and African American. Once a more sensitive procedure for identifying giftedness was devised, the next goal was to develop a model which nurtured the gifts and talents of these students. Project staff hoped that through an inclusive model in the regular classroom setting gifted students would bubble up to the top—that is they would become more easily identifiable through their performance (Swanson, 1995).

The project grew out of the local school district's efforts to identify more African American children for the gifted and talented program. Data indicated that the chances of White, middle income students being identified as gifted were much greater than the chances of African American students of poverty. Further, students in suburban schools were more easily identifiable than students in urban and rural schools. The decision was made to focus the search in rural schools serving students of poverty and to experiment with several nontraditional approaches to uncovering gifts and talents.

The Plan

Three pilot schools, located in the rural South, were selected for the project before plans for the research were clearly articulated. The principals agreed to participate, without really knowing what would be required. The principals agreed because they thought the project would help their students. All of the pilot schools were Schoolwide Title I, rural, and majority African American.

Based on a review of the literature and with input from pilot teachers and SEARCH's advisory board, project staff developed a nontraditional screening procedure to use for identification. All students were screened individually in their kindergarten year with four assessments: the *Raven's Coloured Progressive Matrices* (Raven, 1976), *Thinking Creatively in Action and Movement* (Torrance, 1981), a teacher assessment checklist (Orth, 1986), and a peer nomination interview (Hensel, 1991). Three cohorts of students were identified as potentially gifted based on results of their individual assessments, and these targeted students were followed throughout the project. The percentage of each school population identified ranged from 10-15%.

Along with the identification component of Project SEARCH came the development of an ongoing, sustained program of teacher training. Summer institutes, workshops and professional meetings, ongoing coaching/consultation with a master teacher, whole group meetings, and classroom demonstrations provided teachers with the opportunity to learn new strategies, implement the new strategies in their classrooms, reflect on their practice, and engage in dialogue with others in similar contexts. Curriculum was developed and piloted in classroom demonstrations and became the basis for assisting teachers in deepening their understanding of what "gifted and talented" lessons might look like with their students.

One of the early issues that project staff and pilot teachers had to struggle with was the non-prescriptive nature of the teacher training. While the project staff came into the project with clear notions about the presence of giftedness in all segments of the population, they did not come in with a recipe or cookie cutter approach to finding and serving these under-identified students. Working through the ambiguities of multiple possibilities, and allowing for an evolution of ideas was essential but extraordinarily difficult. The pilot teachers were accustomed to being directed and told what approaches worked best. They had a difficult time shifting to the role of decision-maker and problem-solver.

The model for nurturing the gifts and talents of Project SEARCH students

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gradually evolved out of the teacher training, pilot curriculum, and identification components of the project. Developing an inclusive model was much more difficult than anticipated. Working to change classroom practices of a diverse group of teachers, each with his/her own philosophy of education, was a process that took time and sustained effort. The level of learning and change that occurred depended on the teacher's receptivity and the school environment's support for risk-taking.

The Lessons ... or Learning From Your Mistakes

If this article sounds similar to what you do with your students in your gifted class, then you're beginning to understand this journey. Undertaking a project such as this requires an understanding of the organic nature of change and a high level of patience and persistence. Mistakes are inevitable and must be used as springboards for learning. As Michael Fullan says in his discussion of change, "Problems are our friends" (1993).

The first mistake of Project SEARCH staff was belief in a magic bullet: the first Summer Institute. The proposed plan was based on the premise that the pilot school teachers would gather together during the first summer of the project and develop the model that would be the foundation of Project SEARCH. What happened? Only a handful of teachers and one of the three principals participated in the institute. Thus, lesson one was revealed: Teacher ownership is crucial.

The next mistake was underestimating the effects of a non-prescriptive approach. Project staff strongly supported the assumption that a non-prescriptive, context-responsive approach works best. However, when everyone is making his/her own path, finding his/her own way, how is progress towards project goals best assessed? How does a project end with results that are generalizable or replicable when the approach is non-prescriptive? How can teachers be convinced to shift their roles from trainees to learners? Project staff came to understand that clarity with teachers about how the teachers' classes would look and feel at the end of the project was essential. Teachers began to see what needed to be different about their teaching as their understanding of the desired project outcomes deepened. This mistake helped project staff devise a pilot curriculum that could be used across project classrooms. The pilot curriculum enhanced the nontraditional efforts used in identification and strengthened teachers' understanding of "gifted and talented strategies." The next lesson was that a nonprescriptive approach requires ongoing communication and strong support and encouragement for teachers.

From these mistakes, we created systems that successfully identify poor African American children and promote the use of gifted and talented strategies in regular classrooms. One Project SEARCH teacher commented, "Participating in this project is like getting paid to get an education." Project staff found substantive evidence that rural African American children are gifted and identifiable, but the process takes time, labor, and multiple ways of looking at children. A promising identification practice that emerged was the use of student portfolios. Student work samples were collected across project classes from tasks in the pilot curriculum. Establishing a rubric and assessing these portfolios was another way to find exceptional students.

Identification and labeling students as gifted began to lessen in importance as this project progressed. Many in gifted education are advocating for a broadened view of giftedness, but most continue to focus on methods of identification. Why not focus more on curriculum and instruction? Why not shift to a focus on building on students' strengths? (Renzulli, 1994). Why not work to improve the intellectual quality of the student's experience (Newmann, Secada, & Wehlage, 1995)? Project staff began to see the critical need to provide rich, challenging curriculum and instruction for all children, including the gifted. Challenging the student who scores in the 96th percentile on a Torrance test of creativity is just as important as challenging the student who has an IQ of 146. Providing for the student who can read and write music is as crucial as accelerating the first grader who is ready for algebra.

When it comes to changing teachers' practices, schoolwide involvement is essential. The culture of the school ultimately shapes the classroom environment. Recognition of the classroom teacher's reality means recognition of the obstacles a teacher faces when trying to change his/her practice. These realities include a lack of time for preparation and reflection and the measure of a teacher's worth by his/her "control" of his/her students (Lieberman & Miller, 1990). Teachers' fear of failure is an obstacle for experimentation with innovative instruction. Strong support must be in place if the teacher is to step into the unfamiliar territory of new and innovative teaching strategies.

Conclusion

While Project SEARCH's results were not based on a flawless research design, the changes that occurred were quite positive. The consulting teacher model developed as part of the project has continued to be used in project schools, supported by the local school district's Title I monies. The model is viable for students in the top quartile as well as the bottom quartile. The project's standardized tests scores indicate some positive achievement gains, supporting the use of this model with all students (O'Tuel, 1995). In fact, when federal

funding of Project SEARCH ended in September 1995, the local Title I director funded continuation of the consulting teacher, the teacher training, and support materials. This continued support and partnership with Title I has benefitted gifted students as well as students who are low achievers.

Another positive change has been the local district's use of the *Raven's Coloured Progressive Matrices* as another tool in the identification process. The *Raven's* has helped to identify more gifted African American students and gifted English-as-a-Second-Language students. The project has resulted in increased interest around the state in identifying underrepresented gifted students. Further, the local district has planned and implemented a summer enrichment program for potentially gifted youngsters, including those in Project SEARCH. The project staff secured outside funding for a third summer institute for project teachers and G/T teachers from around the state. Some teachers participated for the third summer in a row!

The changes in teachers' practices have been more subtle. Several of the teachers have emerged as leaders in their schools. Two teachers enrolled in Master's degree programs during the project. One teacher who had been very traditional in her instructional approach has embraced the "gifted and talented" approach of the project's consulting teacher, and they continue to work together closely. Model classrooms have been established in each of the project schools to serve as places in the school for teacher professional development through modeling and coaching.

What is gained through a project such as this? How do projects like this strengthen efforts for gifted education? Aside from the direct impact on students, the most valuable aspect of this project is the education for those involved. Over 30 teachers and principals had the opportunity to learn about how to do a better job of teaching their potentially gifted students. The partnerships formed among classroom teachers, G/T teachers and staff, and Title I teachers and staff created a more focused effort in improving the education of all students, including those who are gifted and talented.

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A Tribute to Paul F. Brandwein

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SCIENCE EDUCATION in the 20th and 21st century will continue to be influenced by Dr. Paul F. Brandwein—scientist, author, artist, master teacher, and humanitarian. Paul died in September 1994, and we miss his presence and enlightened wisdom about so many educational issues. We had the special honor of publishing Paul's last book entitled *Science Talent in the Young Expressed Within Ecologies of Achievement* for our Research-Based Decision Making Series. When we first approached Paul Brandwein about the prospect of documenting his well-tested approach to working with the young to nurture and develop their science-proneness, he did not hesitate to agree. He saw the book as an opportunity to capture his thinking about science and education for two special populations: gifted students and disadvantaged students. His interests, prior work, and continual commitment to making science a joy for students were a perfect match to the Javits legislation which supported our Center. As a teacher at Forest Hills High School in New York City, Paul translated theory into practice as he experimented with eyes-on, hands-on, brains-on, minds-on techniques in science. He continued his approach for decades, even as he moved from high school to colleges and universities around the country and to a large publishing house—Harcourt Brace Jovanovich.

Paul chronicled his theoretical and practical philosophies in several books—two of which have had a great impact on our field:

Brandwein., P. F. (1955). *The gifted student as future scientist.* New York: Harcourt Brace Jovanovich.

Brandwein, P. F., & Passow, A. H. (Eds.). (1988). *Gifted young in science: Potential through performance.* Washington, DC: National Science Teachers Association.

When you read these books and others by Paul, you become acutely aware of his forward thinking about education. He wrote what he believed, what he experienced, and what he wished for the children of the world. The scientific minds of the young could be opened in so many ways through the guidance and the talent of educators. Perhaps this belief was behind the reason for one of his large scale projects for Harcourt Brace Jovanovich. Paul was integral to creating the science series—*Concepts in Science.* To this day, the first author remembers vividly the book emblazoned with his name—Paul F. Brandwein. The series took on special meaning because it offered the novice teacher a hands-on investigative approach. This science series was more than just teachers' and students' editions for various grade levels—leaving teachers and students to navigate their way through the pages unassisted. No!—*Concepts in Science* was a premier series with all the necessary tools, materials, instructions, rocks, minerals, fossils, chemicals, beakers, plastic tubing, measuring devices, etc. to turn traditional elementary classrooms into scientific laboratories. The laboratory atmosphere that Paul knew so well was now available to all who accessed the well-designed, forward-thinking science series. The series may have been concurrent with or preceded other curriculum reform projects of the 1960s. We can't trace the original release date for the series; however, the large closet-size cabinets and small table top compartments in green and purple will never be forgotten because they held the tools and keys to experience the wonderment of science. Students would think and act like professional scientists as they hypothesized and conducted experiments. Science went beyond words on paper—it was what it should be.

For years, Paul visited classrooms around the country to witness his philosophy in action. As a researcher with a quantitative orientation, he also carried the tools of the qualitative researcher—pens and journals—as he observed classrooms and recorded copious notes. He shared some notes in *Science Talent in the Young Expressed Within Ecologies of Achievement* and they are highlighted here as illustrations of science-minded classrooms:

Observations of a Combined Fourth and Fifth Grade Class (1989)

Aim: To study the concept of weight and lead to a concept of mass.

A boy brought up a problem one Friday: "I saw a boy balancing his father on a see-saw. The father was sitting near the hinge at the center; the boy at the end of the see-saw. How does this work?"

Several hands went up, but the class was ending, and the children and teacher agreed to take up the problem on Monday. By then, a girl had "invented" a model: A thin metal ruler on a pivot; four checkers on the ruler near the pivot; two at the end.

"If you know the length of the see-saw," she explained, "you can balance the weights. So *W* (weight of the body) x *L* on the other side." She drew a sketch of the apparatus on the board. "I checked it up in a high school textbook, but I thought up the checkers as weights and made the fulcrum using the edge of a box." She then answered questions, particularly about her "formula." (Brandwein, 1995, p. 44)

Observation of a Rural District of Fourth Graders (1964)

Aim: To illustrate concept formation, based on prior experience and leading to a construct.

In the introduction to the lesson, the teacher probed what his students knew, asking what kind of farms were in the area, what the crops were, what types of plants and animals they cared for, and so forth. He elicited all this information apparently not only to prepare the children's mind-set but also to set them at ease. Then, the teacher held up four hens' eggs—two brown, two white—and asked, "If these were hatched what would come of them?" The response, almost in chorus, "Chicks." One girl asked: "Are the eggs fertilized?" The teacher cracked one open; it was hard boiled. Laughter. "Nothing but lunch will come out of this one."

Asked the teacher, "Suppose they were fertilized—then hatched. What would happen in the next weeks or so?" The boys and girls described how a chick was brought to full development into a hen or a rooster. They discussed such matters as diet, for example. But the teacher noticed that one boy was silent, appearing inactive, and the teacher passed him an egg.

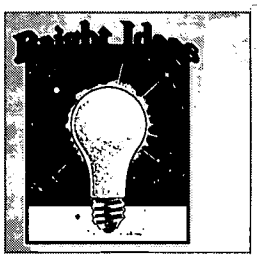
"Why not a duck, an ostrich?" the teacher queried. Softly, the boy said. "It doesn't have the DNA of these animals." With some encouragement, the boy was able to explain that DNA was in the cells of the growing chick. And, when asked—"What's DNA?"—he stood to answer, "deoxyribonucleic acid." He explained with some uneasiness that he learned about DNA first from a TV program; then, he went to an encyclopedia and to magazines; next, he consulted biology textbooks and had conversations with an older brother, then in high school. The construct developed before the end of the lesson: Living things inherit their traits from their parents. (Brandwein, 1995, pp. 41-42)

For decades, we only knew of Dr. Paul F. Brandwein as a scientist and an author. Then in 1981 he honored us with his presence at the University of Connecticut's Confratute, a summer conference/institute on gifted and talented education. Paul was a keynote speaker for an audience of hundreds of administrators and teachers from all over the world. He shared his talents and perspectives as a scientist in describing the historical, contemporary, and futuristic views of science education. He wove scientific theories and practical applications throughout the tapestry of musical compositions as he graced us with his artistic talent as a pianist. Paul combined words and music to send his message. That was the only time that the first author saw Paul Brandwein in person. The name on the cover of *Concepts in Science* took on a very special meaning.

Over a decade later, we were privileged to have several phone conversations with Paul as he prepared his manuscript for the NRC/GT. Paul talked about his work, his progress on the chapters, and his commitment to its completion. Our comments about the brilliance of his work were always greeted with "you're so kind." A man of genius, of scientific notoriety, and a master teacher was so humble. His comment gave us pause because we held him in such high regard. He was the one who was so kind in his unending commitment to science education. He truly made the science classroom a better place for children and teachers alike.

Paul's words were finalized for his NRC/GT monograph in 1994. Unfortunately, Paul never saw the published copy, since it was released in April 1995. He worked so long and hard on his manuscript, and we trust that it will influence the future of science education for decades to come. Dr. Paul F. Brandwein was truly the kind person, scientist, author, artist, master teacher, and humanitarian who has contributed so much to the scientific and educational communities.

Acknowledgments: The authors would like to acknowledge the contributions of Deborah Fort and Evelyn Morholt who dedicated so many hours to fine-tuning Paul's manuscript. Deborah Fort was thrilled when the book arrived at her door. She, too, was honored by the opportunities to collaborate with Paul on many projects. Unfortunately, Evelyn Morholt never saw the final copy due to her untimely death. We shared our gratitude with both collaborators many times, and we will always remember their contributions to this special project.



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Extending the Pedagogy of Gifted Education to All Students

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DURING THE 1994-95 school year, the University of Connecticut site of The National Research Center on the Gifted and Talented (NRC/GT) conducted a study to examine the effects of implementing an innovation called enrichment clusters with all students. Enrichment clusters are a new component of the Schoolwide Enrichment Model (Renzulli, 1994; Renzulli & Reis, 1985) that will be explained briefly later in the article. Major findings of this research are highlighted in this article and those readers interested in the complete results should refer to the technical report entitled *Extending the Pedagogy of Gifted Education to All Students* (Reis, Gentry, & Park, 1995). Additionally, for readers interested in implementing an enrichment cluster program in their school, a video training tape and manual have been produced as a result of this study. The videotape is entitled *Enrichment Clusters: Using High-End Learning to Develop Talent in all Students* (Gentry, Reis, Renzulli, Moran, & Warren, 1995) and will be available in April from the NRC/GT.

Enrichment clusters are designed to provide enrichment to all students during a specified time of the school week. The federal report *National Excellence: A Case for Developing America's Talent* (U. S. Department of Education, 1993) encouraged the use of gifted education strategies in general education and emphasized the role gifted education programs have had on general education:

> Over the past 20 years, while the regular school program focused on basic skills and minimum standards, programs for gifted and talented students served as laboratories for innovative and experimental approaches to teaching and learning. A variety of educational options were developed in programming and scheduling. Many new programs focused on complex thinking strategies and problem solving and used sophisticated teaching strategies . . . developed alternative teaching strategies and interesting curriculum approaches . . . . Now many educators believe that the knowledge and experience that gifted education has gained . . . can be used to upgrade all of education and are calling for this to be done. (p. 23)

Enrichment clusters meet these challenges as they are designed to offer all students an opportunity for challenging, self-selected, real-world learning experiences. Renzulli (1993) indicated that two reasons explain why practices that have been a mainstay of gifted programs are being absorbed into general education to upgrade the performance of all students. The first reason concerns the limited success of remedial-oriented compensatory education programs and practices, and the second reason is the success of practices developed in gifted programs and the need for these practices to be included in the regular curriculum. "All students should have the opportunities to develop higher order thinking skills and to pursue more rigorous content and first-hand investigative activities" (Renzulli, 1993, p. 2). The application of gifted program know-how into general education is supported by a wide variety of research on human abilities (Bloom, 1985; Gardner, 1983; Renzulli, 1986; Sternberg, 1984). This research provides a clear justification for much broader conceptions of talent development, and argues against the restrictive student selection practices that guided identification procedures in the past. This study was designed to add to the limited research base currently available which assesses the benefits of the extension of gifted education pedagogy to the entire school population.

The Enrichment Clusters

The enrichment clusters, one component of the Schoolwide Enrichment Model (Renzulli, 1977, 1994; Renzulli & Reis, 1985), are non-graded groups of students that share common interests and come together during specially designed time blocks during school to pursue these interests (Renzulli, 1994). "Like extra-curricular activities and programs such as 4–H and Junior Achievement, the main rationale for participation in one or more clusters is that *students and teachers want to be there*" (p. 64). Clusters involve all teachers and students as well as parents and community members. The model for learning used with enrichment clusters is based on an inductive approach to solving real-world problems through the development of authentic products and services. Unlike traditional, didactic modes of teaching, this approach, known as enrichment learning and teaching (Renzulli, 1994),

creates a learning situation that develops higher order thinking skills and authentically applies these skills to creative and productive situations. Enrichment clusters are excellent vehicles for promoting cooperativeness within the context of real-world problem solving, and they also provide superlative opportunities for promoting self-concept. "A major assumption underlying the use of enrichment clusters is that *every child is special if we create conditions in which that child can be a specialist within a specialty group*" (Renzulli, 1994, p. 70).

Clusters are offered within the school day at a time that has been decided upon by teachers and staff. In some schools, cluster time is a two hour block in the morning or afternoon one day each week. A brochure is sent home describing the clusters, and all students sign-up for clusters that are based on their interests. The title and description that appeared in a brochure about clusters, and a brief commentary about the cluster written by one of the facilitators is included below to provide further elaboration of enrichment clusters:

> Invention Convention *(Brochure Description)*
> **Facilitated by Robert Erikson, Physicist and Supervisor of Teaching Labs, University of Connecticut; Max Nam, Physics student at the University of Connecticut; and Sandra Rijs, Third Grade Teacher**
>
> Are you an inventive thinker? Would you like to be? Brainstorm a problem, try to identify many solutions, and design an invention to solve the problem, as an inventor might give birth to a real invention. Create your invention individually or with a partner under the guidance of Bob Erikson and his students, who work at the Connecticut Science Fair. You may share your final product at the Young Inventors' Fair on March 25th, a statewide day-long celebration of creativity.
>
> Robert Erikson's commentary:
>
> In the Invention Convention Cluster, we worked with young people and tried to get them to come up with an idea, express that idea verbally, then be able to put it down on paper and come up with some kind of design. Once they came up with some dimensions and materials they needed, they could begin working to put together a project. In working on a project they had the opportunity to see what might go wrong, what might go right, and they had a chance to work with tools for the first time, and do things they hadn't done before. Each student selected his/her own project. If they weren't quite sure what they were talking about, we would prod them until they had a direction . . . but it was all on their own.
>
> There were two types of products I saw from this cluster—one was the finished product, the physical product they could grab hold of and work with and use. The other was the student's understanding what it means to take an idea and go all the way to the end, and his/her realization that it takes more than one try to finish. Students understood how to ask the question, "What do I do next? What if I did this?" The most enjoyable part of working with the cluster was watching the students as they began to dig in, pull out from inside, work towards a project, and see success with that project. Clusters are a superb idea.

Enrichment clusters are not intended to be the total program for talent development in a school, or to replace existing programs for talented youth, but they are one vehicle for stimulating the interests and developing talent potentials of the entire school population. They are also vehicles for professional development as they provide teachers with an opportunity to participate in enrichment teaching, and subsequently to analyze and compare this type of teaching with traditional methods of instruction. In this regard, it is hoped that clusters will promote a spill-over effect by encouraging teachers to become better talent scouts and talent developers, and to apply enrichment techniques to regular classroom situations.

Research Design, Methodology, and Treatment

The major goal of this study was to investigate the effects of the use of enrichment program strategies on the entire population of the school, including students, teachers, staff, and parents. A quasi-experimental design was used in this study with a combination of quantitative and qualitative methodologies. Quantitative methods included descriptive and inferential statistical procedures such as frequency, factor analysis, and multivariate analysis of variance and covariance with repeated measures. Qualitative procedures included: observations, interviews, and questionnaire data gathered through the use of participant observation (Spradley, 1980). Field notes, transcriptions of the interviews, document review, and all other collected data were coded and analyzed for patterns and themes. The coding process combined techniques described by Spradley (1979; 1980) and by Strauss and Corbin (1990).

A research team was used to facilitate and conduct the study consisting of a principal investigator, an on-site research associate, a research analyst, and two on-site research liaisons who implemented and collected the data. Teachers in both treatment schools

(continued on page 12)

(continued from page 11)
received training in how to implement enrichment clusters, and each teacher and parent in the school received an invitation to organize a cluster. The enrichment clusters met for 10 weeks in one school and for 12 weeks in the other school. Clusters were facilitated by teachers, parents, students, and community volunteers during one hour sessions that were scheduled weekly.

Sample

Two urban school districts agreed to participate in this study. Both were culturally diverse and contained a high concentration of economically disadvantaged students. One district had a minority population of 42.9%, and the other district's minority population of 35% consisted primarily of Hispanic students, many of whom had limited English proficiency. Two elementary schools were designated as treatment schools that would implement the clusters, while a third elementary school that was similar to the treatment schools in terms of size and ethnicity was assigned to serve as a comparison site.

Research Questions

The research questions that guided the implementation of enrichment clusters and the collection and analysis of data for the study were as follows:

1. What are the effects of the implementation of enrichment clusters on students' interests, attitudes about school, and product development?
2. What are the effects of the implementation of enrichment clusters on parental attitudes about school satisfaction?
3. How do teachers in the groups differ with respect to their attitudes about the use of enrichment activities for students?
4. Do teachers in the experimental sites use strategies learned in organizing enrichment clusters in their regular classroom teaching?
5. In what way is advanced content used in enrichment clusters?
6. How many students complete products in the enrichment clusters and what is the achievement level of students completing products?
7. Does the quality of student products differ among students of various levels of achievement?

Results

Following is a partial summary of the results found in this research study. The data analyses were conducted on categories of *program success, student interests, student attitudes, student products, parental attitudes,* and *teacher practices.*

1. It was possible to successfully implement enrichment clusters in low socioeconomic, culturally diverse urban schools in which these clusters can be adapted and tailored to fit individual school schedules and needs.
2. Both schools that participated in the study continued the program during the next school year.
3. Cross age grouping by interest was successful in enrichment clusters.
4. Community members were actively involved on a regular basis in schools through enrichment clusters.
5. Total schoolwide enrichment could be provided and gifted education pedagogy was successfully extended to students of all achievement levels using enrichment clusters.
6. Attendance was higher on enrichment cluster days than on non enrichment cluster days.
7. Approximately 90% of the students completed projects in clusters, and there were no differences in the number of projects produced when examined by achievement, gender, special program placement, or ethnicity.
8. The quality of products was examined and no differences were found among various achievement levels of students. This suggests that it is not the academic achievement level of the student that is important in product development, but rather the level of interest and commitment toward the self-selected project in the enrichment cluster. When students of common interest work together toward development of a product, achievement does not appear to predict the level of the process of product development or the overall quality of the resulting products.
9. In both treatment schools, parents' perceptions about enrichment and their satisfaction with enrichment improved after the implementation of the enrichment clusters.
10. Teachers who facilitated or assisted with clusters began to use strategies from enrichment clusters in their regular classrooms. These strategies included using both content and methods. Content included such areas as the development of centers related to cluster content, the integration of cluster content into the classroom curriculum and lessons, and the use of ideas and community resources gained from the clusters within the classroom.
11. Teaching methods were another area that was influenced by the enrichment clusters. Teachers reported several categories of methodological influences including: considering student interests, using hands-on activities, allowing for student direction and choices, using interest groups within the classroom, encouraging student products and independent work, and concentrating on thinking skills.
12. Approximately 60% of the teachers said that clusters influenced what they now do in their classrooms.
13. Teachers used advanced content and methodologies in the enrichment clusters and provided challenges and choices to the students. The types of advanced content and the frequency of use are depicted in Table 1.
14. Over 50% of the teachers that facilitated clusters in their schools indicated that they transferred the strategies that they had learned and used in their enrichment clusters into their classrooms, although this had not been requested of these teachers as a part of their participation in the study.

Implications

This research study indicated that one type of pedagogy often used in gifted education programs can be extended to students who are not usually included in special programs for talented students. The students who benefited

from this research study were from urban areas. Many were poor, had limited English proficiency, and had been repeatedly involved in remedial education programs. In one school, over 80 students were involved in special education programs and were bussed to this school because of its physical accommodations for students with disabilities. During the cluster program in this specially designated time in school, everything changed. Students left their classrooms and in a minute or two sped joyfully down the hallways to another room and another adult. Their evaluations of the program were extremely positive and indicated that enrichment clusters fostered excitement about learning and demonstrated the benefits of schoolwide enrichment for all students.

Most teachers genuinely seemed to enjoy facilitating the clusters and they did not regard it as just another preparation. Interviews indicated that the teachers looked forward to having an opportunity to share their interests with students who have similar interests and learning styles. Additionally, the implementation of the cluster program also resulted in the recruitment of many parents and community members into the school in roles that many of them had not previously pursued. This role allowed parents to share talents, areas of expertise, hobbies, and special abilities, and many of them were delighted to be able to be more involved in the school and have their children's teachers know them in a different way. The same was true for many community members who facilitated clusters. The implementation of enrichment clusters may then provide a triple opportunity: enrichment learning opportunities for all children, professional growth opportunities for teachers in differentiation strategies and in enrichment learning and teaching, and opportunities for parents and community members for more involvement in the school.

Table 1
Advanced Content and Methodologies by Frequency and Percentage of Use

Strategy	School A	School B	Total
1. Introduction of New Concepts and Advanced Content	52 (91)	62 (98)	114 (95)
2. Development of Product or Service	49 (85)	48 (76)	97 (81)
3. Teaching Specific, Authentic Methodologies	40 (70)	48 (76)	88 (81)
4. Use of Advanced Vocabulary	39 (68)	39 (62)	78 (65)
5. Use of Authentic "Tools" Related to the Topic	27 (47)	40 (63)	67 (56)
6. Use of Advanced Resources and Reference Materials	25 (44)	38 (60)	63 (53)
7. Use of Advanced Thinking and Problem Solving Strategies	26 (46)	27 (43)	53 (44)
8. Integration of Creative Thinking	24 (42)	27 (43)	51 (43)
9. Integration of Historical Perspectives	14 (24)	15 (24)	29 (24)
10. Development of Presentations or Performances	9 (16)	7 (11)	16 (13)
11. No Advanced Content Used	5 (9)	1 (2)	6 (5)

Note: Numbers in parentheses are percentages

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Stimulating Student Creativity: A Review of *Creativity in the Classroom*

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AS THE TITLE OF THE book suggests, *Creativity in the Classroom*, by Alane Jordan Starko, provides practical suggestions for teachers interested in how best to incorporate creativity training into the curriculum. The book is divided into two main parts, the first of which deals with theory and research as it pertains to an understanding of this ambiguous construct. What is particularly interesting about the first section is that it is "teacher friendly." It explicates a variety of theories in such a way that the teacher comes away with how such theories provide a foundation for classroom practice. The author points out the concrete implications of what may at first appear to be abstract conclusions. In the second section, a distinct shift is made from theory to practice. Emphasis is placed on stimulating student creativity in content areas, and a description of creative thinking strategies that cut across a variety of domains. The purpose of this review is to highlight what I consider to be the important and interesting aspects of each section to provide "food for thought" for those interested in pursuing the book in more detail.

Starko begins her book by examining the question that researchers often wish to avoid, namely, "What is creativity?" After reviewing a variety of definitions, mainly concerned with describing adult creativity, the author arrives at the conclusion that most definitions revolve around two main concepts: novelty and appropriateness. For the adult, an idea or a product is considered novel if it adds something new to a particular domain. One cannot simply reiterate what is already known and hope to be considered creative. Appropriateness, on the other hand, is determined by "the fit" between a creative work and the cultural expectations of a particular society. The appropriateness of a creative endeavor can vary from one society to another, and in the same society during different historical eras. As long as the creative outcome "meets some goal or criterion," (p. 6) it is usually considered appropriate. Although novelty and appropriateness are two concepts intimately linked to understanding creativity, the author questions how these terms can be effectively applied to children. Do their works have to add something new to a domain? Are they appropriate only if they mesh with societal expectations? The obvious answer to both of these questions is no. Starko describes novelty and appropriateness as they apply to children's creative products and ideas as follows,

> We will consider children's efforts appropriate if they are meaningful, purposeful, or communicative in some way. If students successfully communicate an idea or endeavor to solve a problem, their efforts can be considered appropriate. If they do so in a way that is original, at least to them, we can consider the efforts creative. (p. 7)

This practical definition forms the basis of the concrete suggestions the author provides for enhancing student creativity in the classroom.

As with most books that attempt to provide a comprehensive overview of creativity, *Creativity in the Classroom* describes the latest research and theoretical advances. The "investment theory of creativity" put forth by Sternberg and Lubart (1991, 1993) is discussed, as well as Gardner's (1993) findings pertaining to the biographical factors related to creative productivity in eminent adults. It should be noted, however, that the author does not overlook important findings from the past. A significant part of Chapter 2 is devoted to summarizing a host of theories ranging from Freud's psychoanalytic doctrines to Maslow's distinction between "special talent" and "self-actualizing creativeness."

Before embarking on practical considerations, Starko devotes an entire chapter to what she labels "talent development" and the ideas that underlie this concept. Her humanistic approach to creativity is firmly based on research conducted by Bloom and his colleagues (1985) who recognized that the development of talent can be separated into three relatively distinct phases: 1) the early years, characterized by playful exploration within the domain of choice, 2) the middle years which focus on the technical mastery of principles and techniques within the domain, and 3) the later years, with an emphasis on the individual as a creative producer. This third and final phase represents a radical shift for the student, from a solver of predetermined problems, to one who must find problems in need of solution. While the practical implications of this research may not be readily apparent, Starko does emphasize the need for content and process immersion, before one can hope to solve problems effectively.

More research dealing with the nature of problem finding must be done. Starko provides suggestions for helping students locate interesting problems. She points out that most of the problems students deal with in school have one pre-determined answer, and one pre-determined method for arriving at that answer. A shift needs to occur so that students are allowed to postulate their own problems related to a topic, and then go on to conceive of ways to

solve the problem in an efficient manner. Enabling students to select problems encourages divergent thinking in terms of the problems under consideration, and the solutions that are appropriate.

Amabile's (1989) emphasis on the relationship between creativity and intrinsic motivation is the final element considered by Starko as related to talent development. Simply stated, if a student does not find a problem interesting at a personal level, he or she will not put forth the time and energy needed to develop a meaningful solution. Amabile's research tends to point out that even positive, external motivation tends to suppress creative productivity. Of all the chapters in the book, teachers will most likely find Chapter 5, "Creativity in the Content Areas" to be the most useful. I say this because it provides numerous suggestions for incorporating creativity training into language arts, social studies, science, and math. As an organizing framework, the author points out several key considerations that apply to almost any content area. She emphasizes that creativity revolves around finding, focusing, and solving problems, as well as expressing ideas in unique ways. The student must assume the role of a creative person in a particular field, utilizing both content and methodology, to develop products that address specific problems.

What I liked most about the specific suggestions related to the content areas is that most seemed easy to implement. In fact, without realizing it, many teachers might already be fostering creativity in their classrooms. For example, in language arts Starko recommends the extensive use of writing to stimulate student creativity. It must be writing of a certain type, however, that emphasizes student selected topics and the writing process. With regard to social studies, teachers need to realize that it is not simply a collection of facts to be memorized. One must consider what the historian, geographer, etc. do to develop new theories and products. The big ideas involved in human history, as well as the methodologies used by practicing professionals must be employed.

In addition to specifics related to each content area, general strategies that apply to any domain are provided. Attention is given to the use of inductive teaching (in which students are presented with specific examples that they use to determine underlying principles and concepts), the use of simulation and role playing activities, and the importance of divergent questioning by the teacher. Popular techniques such as brainstorming, synectics, and creative problem solving are also described.

It should be readily apparent that fostering creativity in the curriculum will require creative forms of assessment as well. Traditional testing is simply not an adequate means of evaluating creative ideas and products. Starko calls for the use of ". . . authentic or performance assessment [which] means that students are evaluated on their performance of realistic, exemplary tasks" (p. 282). Such tasks, and the resulting assessment, focus on complex thinking and problem solving skills, are relevant and interesting to the students, and call for the development of an original product or a performance. The use of scoring rubrics is also deemed essential, as well as student self-evaluation.

Not only must assessment be reexamined, but the entire classroom organization as well. The teacher must first develop a sense of "psychological safety" by allowing students to take risks and experiment with new ideas. Students must be allowed to work independently for a part of each day, focusing on topics that make them want to learn. The development of interest centers can be helpful in this respect.

Starko also addresses the volatile topic of ability grouping. She is of the opinion that grouping which focuses on specific talent areas should be utilized to provide for the needs of high ability students. As she states,

> The most reasonable approach to grouping in schools is to avoid debating whether we should group and to decide what grouping arrangements best meet the needs of a given group of students for a particular activity. The effectiveness of rigid, long-term grouping based on ability can be questioned, but flexible, within- or between-class groupings based on particular academic needs is associated with increased achievement. (p. 277)

It is important to note that Starko does not rule out the use of cooperative learning with high ability students, but she does emphasize the need for individual accountability if it is to be effective.

There are numerous issues addressed by *Creativity in the Classroom* that I have not mentioned. Such topics include creativity traits, the use and abuse of creativity tests, and commercial creativity competitions. All are addressed by the author. To reiterate a point mentioned earlier, the greatest strength of this book is its emphasis on practical recommendations and specific techniques for fostering creativity in the classroom. Any teacher desiring to implement creativity into the curriculum will find this book invaluable.

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The *NRC/GT Newsletter* is published by The National Research Center on the Gifted and Talented, University of Connecticut. The Research Center is supported under the Educational Research and Development Centers Program, PR/Award Number R206R50001, as administered by the Office of Educational Research and Improvement (OERI), U. S. Department of Education.

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