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ABSTRACT

This compilation of ERIC Digests describes issues, highlights exemplary programs and promising practices, and explains research results that can assist educators in achieving the far-reaching national education goals adopted by the President and the governors in 1990. The two lead digests are "An Overview of the Six National Education Goals" and "The National Education Goals: Questions and Answers" (Beverly B. Swanson). The remaining digests are divided into sections that address each goal; each section contains a digest that provides an overview of that goal, followed by additional digests that discuss related issues. Goal 1: Readiness for School is addressed by "Readiness: Children and Schools" (Lilian G. Katz) and "Preparing Children with Disabilities for School" (Dianna Pinkerton). Goal 2: High School Completion is addressed by "Meeting the Goals of School Completion" (Joseph C. Grannis); "School Completion 2000: Dropout Rates and Their Implications for Meeting the National Goal" (Craig Howley and Gary Huang); "Promising Strategies for At-Risk Youth" (Alan Baas); and "Middle School Education--The Critical Link in Dropout Prevention" (Amy Stuart Wells). Goal 3: Student Achievement and Citizenship is addressed by "Student Achievement in Core Subjects of the School Curriculum" (John J. Patrick); "Encouraging Writing Achievement Across the Curriculum" (Sharon Sorenson); "Achievement of Knowledge by High School Students in Core Subjects of the Social Studies" (John J. Patrick); "Fostering Academic Creativity in Gifted Students" (E. Paul Torrance and Kathy Goff); "The Academic Achievement of Limited English Proficient Students" (Vickie W. Lewelling); and "Assessing Civics Education" (Lawrence M. Rudner). Goal 4: Science and Mathematics is addressed by "Meeting National Goals for 2000 and Beyond in Science Education" (Robert E. Yager and Patricia E. Blosser); "Meeting National Goals for 2000 and Beyond in Mathematics Education" (James Hassell and Joan Armistead); "Computer Uses in Secondary Science Education" (Ronald H. Morse); "Selected Procedures for Improving the Science Curriculum" (Patricia E. Blosser and Stanley L. Helgeson); "Students at Risk in Mathematics: Implications for Elementary Schools" (Margaret Kasten

and Robert W. Howe); and "Curriculum and Evaluation Standards for Mathematics Education" (Marilyn N. Suydam). Goal 5: Adult Literacy and Lifelong Learning is addressed by "School to Work Transition: Its Role in Achieving Universal Literacy" (Susan Imel); "The Community College Role in Achieving Adult Literacy" (Dana Nicole Williams and Anita Y. Colby); "The Role of Libraries in Literacy Education" (Linda Schamber); "Adult Literacy Programs in Rural Areas" (Susan Ferrell); and "Recruiting and Retaining Language Minority Students in Adult Literacy Programs" (Shirley Brod). Goal 6: Safe, Disciplined, and Drug-Free Schools is addressed by "Are School-Based Drug Prevention Programs Working?" (Caroline E. Mohai); "Alcohol and Drug Use among Adolescents" (Laurie LaChance); "Drug and Alcohol Prevention Education" (Liane M. Summerfield); "College Alcohol and Drug Abuse Prevention Programs: An Update" (Margot Sanders Eddy); and "School Security" (Joan Gaustad). (MLF)

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October 1991

Striving for Excellence:

The National Education Goals

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INTRODUCTION

This compilation of *ERIC Digests* describes issues, highlights exemplary programs and promising practices, and explains research results that can assist educators in achieving the far-reaching **National Education Goals** adopted by the President and the governors in 1990.

Each of the 16 Clearinghouses that form the Educational Resources Information Center (**ERIC**) regularly synthesizes research and compiles information into short *ERIC Digests*. The *Digests* contained in this collection describe a range of possible responses to the **National Education Goals**; however, they are not meant to be comprehensive. This collection is just a beginning step in organizing and disseminating practitioner-oriented materials that, first, explain the **Goals** and why they are important, and, second, suggest ways in which teachers, administrators, and parents can take action likely to result in improved educational opportunity and achievement.

The two lead *Digests* provide an overview of the six **Goals**, discuss their potential impact on the expectations of American education, and address commonly asked questions about the **Goals**. The remaining *Digests* are divided into sections that address each **Goal**; each section contains a *Digest* that provides an overview of that **Goal**, followed by additional *Digests* which discuss related issues.

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CONTENTS

An Overview of the Six National Education Goals 1
The National Education Goals: Questions and Answers 3

Goal 1: Readiness for School 5
Readiness: Children and Schools 7
Preparing Children With Disabilities for School 9

Goal 2: High School Completion 11
Meeting the Goals of School Completion 13
School Completion 2000: Dropout Rates and Their Implications for Meeting the National Goal 15
Promising Strategies for At-Risk Youth 17
Middle School Education—The Critical Link in Dropout Prevention 19

Goal 3: Student Achievement and Citizenship 21
Student Achievement in Core Subjects of the School Curriculum 23
Encouraging Writing Achievement Across the Curriculum 25
Achievement of Knowledge by High School Students in Core Subjects of the Social Studies 27
Fostering Academic Creativity in Gifted Students 29
The Academic Achievement of Limited English Proficient Students 31
Assessing Civics Education 33

Goal 4: Science and Mathematics 35
Meeting National Goals for 2000 and Beyond in Science Education 37
Meeting National Goals for 2000 and Beyond in Mathematics Education 39
Computer Uses in Secondary Science Education 41
Selected Procedures for Improving the Science Curriculum 43
Students at Risk in Mathematics: Implications for Elementary Schools 45
Curriculum and Evaluation Standards for Mathematics Education 47

Goal 5: Adult Literacy and Lifelong Learning 49
School to Work Transition: Its Role in Achieving Universal Literacy 51
The Community College Role in Achieving Adult Literacy 53
The Role of Libraries in Literacy Education 55
Adult Literacy Programs in Rural Areas 57
Recruiting and Retaining Language Minority Students in Adult Literacy Programs 59

Goal 6: Safe, Disciplined, and Drug-Free Schools 61
Are School-Based Drug Prevention Programs Working? 63
Alcohol and Drug Use Among Adolescents 65
Drug and Alcohol Prevention Education 67
College Alcohol and Drug Abuse Prevention Programs: An Update 69
School Security 71

Most of the references cited in this publication—those identified with an ED or EJ number—have been abstracted and are in the ERIC database. Journal articles (EJ) should be available at most research libraries; documents (ED) are available in ERIC microfiche collections at more than 900 locations. Documents can also be ordered through the ERIC Document Reproduction Services at 1-800-443-ERIC.

An Overview of the Six National Education Goals

by Beverly B. Swanson

To improve the quality of education in the United States, the nation's leaders have established six national goals, based on the premise that every child can learn, and that education is a lifelong process (Executive Office of the President, 1990). Achieving these goals will require the sustained effort of all sectors of society, including business and industry, social agencies, federal, state, and local governments, parents, educators, and the public. This Digest highlights practices for educators to consider in order to achieve the national education goals.

Goal 1 -- Readiness for School: By the year 2000, all children in America will start school ready to learn.

The first goal is the most popular with educators. Respondents to the 22nd Annual Gallup Poll (Elam, 1990) cited the goal as one of their top priorities and accorded it the highest likelihood of attainment. To help achieve Goal 1, schools with preschool programs can...

- **provide developmentally appropriate programs.** All preschoolers, but particularly "at-risk" children, need a curriculum and learning environment appropriate to their experiences and capabilities (NAEYC, 1990).
- **use more comprehensive readiness assessment practices.** Readiness remains a poorly defined concept, yet it is used to determine school entry, retention, transition classes, and type of program [structured vs. unstructured]. A growing number of educators advocate the use of checklists and anecdotal records to assess readiness (Meisels, 1989).
- **coordinate preschool programs with social service agencies.** To achieve the health, education, and welfare of families, pre- to postnatal programs, family health and nutrition programs such as WIC, and jobs and training programs for parents should be coordinated with preschool programs (Kagan, 1990).

Goal 2 -- High School Completion: By the year 2000, the high school graduation rate will increase to at least 90 percent.

Achieving Goal 2 will entail the joint efforts of schools, communities, and students. Schools must nurture the social, physical, emotional, and intellectual growth of their students. To help achieve Goal 2, schools can...

- **examine exemplary dropout prevention programs.** Hamilton (1986) identified 17 well-documented programs that improve dropout rates, test scores, and absentee rates by providing a supportive alternative learning environment, providing resources such as counseling, tutoring, health care, and employment, and using the four C's--cash, care, computers, and coalitions (Mann, 1986).
- **reexamine curriculum and guidance programs.** When schools are seen as too rigid and demanding, students are likely to drop out. Schools that offer students challenging but flexible instructional options build on their abilities to achieve in different areas (Gardner & Hatch, 1989).
- **solicit parental support.** Parental support and input are key to keeping students in school. Some districts hire a parent educator to work with parents of at-risk children or offer support groups in which parents define the discussion topics (Hart, 1988).

Goal 3 -- Student Achievement and Citizenship: By the year 2000, American students will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy.

Goal 3 encompasses academic achievement, thinking skills, and citizenship; its intent is to prepare students to be productive citizens. To help achieve Goal 3, schools can...

- **join the school restructuring movement.** Restructuring trends include a shift toward school-based management and decentralized decision-making (Harvey & Crandall, 1988).
- **use a challenging curriculum.** Goodlad (1984) suggests cooperative goal setting by students, in which some curriculum is planned by the students themselves. An environment that engages students also alleviates class disruptions, tardiness and absenteeism.

- **use appropriate measures of achievement.** New measures of achievement must be developed to test the knowledge, achievement, and competencies of students beyond the level of memorization.

Goal 4 -- Science and Mathematics: By the year 2000, U.S. students will be first in the world in science and mathematics achievement.

Educators agree that achieving a competitive role in science and math will require a change in the ways that science and math are currently taught, better-trained math and science teachers, and reliable means of assessing students' math and science skills. To help achieve Goal 4, schools can...

- **identify and adopt exemplary science programs,** which begin in the early grades. Elementary schools can appoint a committee to examine science programs with hands-on discovery activities (Sivertsen, 1990). Exemplary programs also exhibit high levels of teacher knowledge, large blocks of time for science instruction, good science materials, and administrative support.
- **identify and remove barriers** to students' understanding of math and science concepts, e.g., math anxiety, gender and ethnic stereotypes (Wigfield & Meece, 1988).

Goal 5 -- Adult Literacy and Lifelong Learning: By the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

Goal 5 calls for the improvement of education practices on all fronts, beginning with increased literacy activities in the homes of preschoolers and extending to post-secondary levels. To help achieve Goal 5, schools can...

- **work with communities to establish family literacy programs** that offer services to families without literacy skills and resources to foster reading and writing activities in the home (Nickse, 1989).
- **collaborate with local businesses to determine the workforce skills** needed by students who live and work in that community. Critical skills such as listening and speaking may be fostered by the school curriculum (Natriello, 1989).

Goal 6 -- Safe, Disciplined, and Drug-Free Schools: By the year 2000, every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning.

Schools, families, and communities must work together to counteract negative social influences and create safe and orderly schools. To help achieve Goal 6, schools can...

- **use preventive discipline** by structuring school and classroom environments for maximum learning and emphasizing community and self-responsibility among students (Grossnickle & Sesko, 1990; Moles, 1989).
- **define discipline policies and consequences clearly** and build in positive reinforcements for good behavior (Gottfredson, 1989).
- **begin a drug prevention program as early as preschool level** that incorporates self-esteem along with responsibility and good health habits (Steele, 1988). Programs should continue throughout the school years and address risk factors such as peer pressure (Hawley, 1990).
- **establish a firm antidrug policy** supported by appropriate action. Schools, communities, businesses, and social services should send a clear no-drug message to students and collaborate in prevention efforts (Hawley, 1990).

All Americans must participate in achieving the six national education goals if our nation is to maintain a vigorous economy and responsible democracy.

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The National Education Goals: Questions and Answers

by Beverly B. Swanson

American citizens agree that the time has come to improve our schools and support the nation's leaders in their call for sweeping education reforms. Goals have been stated, objectives written, and a plan developed (AMERICA 2000) for fundamental changes in the American educational system. The public, however, raises legitimate questions concerning the purpose and attainment of these goals.

This Digest addresses questions the general public may have about the six national goals and the President's plan for educational reform.

Question 1: What are the six national goals for education?

Briefly stated, the education goals are: (1) that by the year 2000, all children will start school ready to learn; (2) that 90 per cent of high school students will graduate; (3) that students will be competent in basic subjects and exhibit responsible citizenship; (4) that U.S. students will lead the world in mathematics and science; (5) that every American adult will be literate; and (6) that schools will be drug-free and safe (Executive Office of the President, 1990).

Question 2: Are the goals attainable?

The most recent Gallup Poll of 1,594 adults (Elam, 1990) shows widespread support for the goals. The goals with the highest approval (88%) were the call for children to be ready to start school and for children leaving grades 4, 8, and 12 to demonstrate competency in basic subject areas. Poll respondents indicated that the school readiness goal may be the most attainable.

Question 3: Which goal is the most important for the general public to implement?

Although not directly stated as a national goal, more parental or adult intervention in children's lives is needed to improve American education. For years, education research has demonstrated the importance of parental involvement, but most contacts of parents with schools have been superficial (Henderson, 1987; Peterson, 1989). Effective schools involve parents in their children's learning and in their school life. Adults need to talk to children about school, stress the importance of school by providing a supportive learning environment in the home and helping students develop good study habits, and work with communities and schools in creative ways to involve parents in their children's education.

Question 4: How does school choice fit in with the national goals to improve American education?

The national goals are part of a comprehensive education reform strategy known as AMERICA 2000. State and local choices for parents and students are seen as critical to improving schools and will be promoted as part of AMERICA 2000. The central incentive for change is competition. If families have choices in selecting schools for their children, some schools will improve to stay in the business of educating children. School choice could also benefit children who could not otherwise attend a private or parochial school, but additional resources would have to be made available for this to occur. For example, businesses have donated money so that children from low-income families may attend private schools; the "voucher system," in which state funds follow the student, would allow some students to attend private schools.

Question 5: Will the federal government put more money into education to fund the six national goals?

Although the federal price tag for the first year of the education plan (1992) will be relatively small, resources will be redirected, and new sources will be sought through the business community. Most of the money will go to establish 535 or more model or exemplary schools to demonstrate for other schools innovative educational techniques. Some funds will be allocated for locally devised programs to allow parents to choose schools for their children, and a smaller amount will be used to identify and reward outstanding students and teachers.

Question 6: Does the plan for education improvement involve national testing?

The education strategy outlined recently by President Bush has called for national testing, but on a volunteer basis. The test results may be used for college admissions

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and also by some employers for hiring workers. To measure whether progress toward the national goals has been made at the specified grades (4, 8, and 12), reliable means of measurement will need to be developed, tested, and applied across the nation's schools. Whether or not these tests will eventually be mandated is not presently known.

Question 7: Does the new education plan address the quality of teachers?

A key part in the new education initiative is to increase salaries for those teachers that teach challenging subject matter—and teach it well—in such areas as math, science, English, geography, and history. Alternative certification systems will be developed to allow new college graduates with degrees in disciplines other than education to become teachers. Furthermore, teacher training institutions have been reviewing their teacher preparation programs over the last 5 years. As a result, many institutions now require elementary teachers to demonstrate indepth knowledge through a second degree or concentration in an academic area, e.g., math, science, or history. This requirement does not suggest that teaching skills and methods are being removed from the preparation of teachers. Rather, the stress on having a content area specialty, along with teaching skills and methods, will increase the quality of teaching in schools.

Question 8: What role will communities take in the proposed education reforms?

Education partnerships, volunteer work, and community service in the schools are being advocated by our nation's leaders. Strong and constant community involvement is needed to meet the goals of safe, drug-free schools, nationwide literacy for all, and high graduation rates. Communities may want to develop their own plans for improvement by establishing model programs and public-private partnerships to fund particular local incentives, e.g., student and teacher achievement. Each community should examine the six national goals in light of the needs of its children and families. The community as a whole must send the same message to all children and their parents: "School is important and your community values education."

Question 9: How can America be number one in math and science by the year 2000?

It is alarming that Americans' scientific literacy has decreased as our world has become more scientific and technological. In the last decade, improvement initiatives have been developed, but the country needs to go much further in these efforts. One initiative has been developed by the American Association for the Advancement of Science (AAAS) to help reform science, mathematics, and technology education in the United States by addressing such questions as: What is the nature of scientific knowledge and skills? How can scientific literacy be achieved across the nation? Knowledge about science and math concepts should begin early and continue throughout each individual's lifespan in order for Americans to be both knowledgeable and competitive in the technological arena.

Question 10: How can communities stress citizenship?

According to a recent survey, the youth of America are apathetic about civic values and responsibilities (National Assessment of Education Progress, 1990). Families and schools must influence youth to take an active part in their communities by stressing civic values and activities. The best way to teach the young is through serving as role models: adults need to gather information and discuss issues, to vote, to volunteer to help others, and to encourage their children to do the same.

The six national goals and the education strategies springing from these goals will have a great impact on schools and schooling in the next decade.

The solvable problems in education are those deemed important by the general public. Thus, all able and concerned Americans should examine the six national goals and exert influence and energy in areas in which they can effect change. It is only through such a collaborative effort that excellence in education can be achieved.

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Goal 1: Readiness for School

By the year 2000, all children in America will start school ready to learn.

Objectives

- All disadvantaged and disabled children will have access to high quality and developmentally appropriate preschool programs that help prepare children for school.

- Every parent in America will be a child's first teacher and devote time each day helping his or her preschool child learn; parents will have access to the training and support they need.

- Children will receive the nutrition and health care needed to arrive at school with healthy minds and bodies, and the number of low birthweight babies will be significantly reduced through enhanced prenatal health systems.

Readiness: Children and Schools

by Lilian G. Katz

Concern for the readiness of America's children to profit from school experience was expressed by the President and the nation's governors at a summit meeting in 1990. The first of six educational goals outlined at the meeting was that "all children will start school ready to learn" by the year 2000. Three objectives emerged from discussion of ways to achieve this goal. Communities and schools must:

- Provide disadvantaged and disabled children with access to high quality and developmentally appropriate preschool programs designed to help prepare them for school.
- Recognize that parents are children's first teachers and encourage them to spend time daily to help their preschool children learn; provide parents with training and support.
- Enhance prenatal health systems to reduce the number of low birthweight babies; ensure that children receive the nutrition and health care they need to arrive at school with healthy minds and bodies.

The Concept of Readiness

Consideration of the readiness goal and the more precise objectives raises questions about the concept of readiness and its meaning to policymakers and educators. This concept has been debated for more than a century (Kagan, 1990). The main issue debated is the extent to which development and learning are determined by the biological processes involved in growth versus the experiences children have with parents, peers, and their environments. Those who emphasize internal developmental processes believe that the passage of time during which growth occurs renders the child more or less able to benefit from formal instruction. Those who emphasize experience take the position that virtually all human beings are born with a powerful built-in disposition to learn and that inherent growth processes and experience both contribute to children's learning.

The quantity and rate of learning in the first few years of life are nothing short of spectacular. The fact that by 3 or 4 years of age most children can understand and use the language of those around them is just one example of learning that takes place long before children begin school.

However, what children learn, how they learn, and how much they learn depends on many factors. Among the most important factors are the child's physical well-being and his emotional and cognitive relationships with those who care for him. The school readiness goal reflects two concerns about the education of young children. The first is that many young children live in poverty, come from single-parent households, have limited proficiency in English, are affected by the drug abuse of their parents, have poor nutrition, and receive inadequate health care.

The second area of concern involves issues related to placement to determine children's readiness to enter schools (e.g., the high rates of retention in kindergarten and the primary grades, delayed school entry, segregated transition classes, and the increasing use of standardized tests, which are inappropriate for children under 6). These issues are due largely to the fact that an academic curriculum and direct instruction teaching practices that are appropriate for the upper grades have gradually been moved down into the kindergarten and first grade.

These two areas of concern suggest that reaching the school readiness goal will require a twofold strategy: one part focused on supporting families in their efforts to help their children get ready for school, and the second on helping the schools to be responsive to the wide range of developmental levels, backgrounds, experiences, and needs children bring to school with them.

Getting Children Ready for School

The term *readiness* is commonly used to mean *readiness to learn to read*. However, children's general social development and intellectual backgrounds should also be

taken into account when considering ways to help them prepare for school.

- **Social readiness.** Children are more likely to cope successfully with their first school experience if they have had positive experience in being in a group away from their home and familiar adults. Young children can approach new relationships with confidence if they have already had some positive experience in accepting authority from adults outside of their family. They are also more likely to adjust easily to school life if they have experienced satisfying interaction with a group of peers and have thereby acquired such social skills as taking turns, making compromises, and approaching unfamiliar children. Parents and preschool teachers can contribute to social readiness by offering children positive experiences in group settings outside of the home, and by helping children strengthen their social skills and understanding (Katz & McClellan, 1991).

- **Intellectual readiness.** Children are more likely to feel competent in school if they can understand and use the language of the peers and the adults they meet in school. They are also more likely to have confidence in their own ability to cope with school if they can relate to the ideas and topics introduced by the teacher and other children in class discussion and activities.

Parents and preschool teachers can strengthen intellectual preparedness by providing children ample opportunity for conversation, discussion, and cooperative work and play with peers who are likely to start school with them. Parents of children not enrolled in a preschool program can help by talking to the staff at the child's future school about the kinds of stories, songs, and special activities and field trips usually offered at the school, and by introducing related topics to their children.

Getting the School Ready for the Children

The most important strategy for educators to address the readiness goal is to prepare the school to be responsive to the wide range of experiences, backgrounds, and needs of the children who are starting school.

- **Appropriate curriculum.** A position statement on school readiness issued by the National Association for the Education of Young Children (1990) points out that, given the nature of children's development, "the curriculum in the early grades must provide meaningful contexts for children's learning rather than focusing primarily on isolated skill acquisitions" (p. 22). The curriculum should emphasize informal work and play, a wide range of activities related to the children's direct, firsthand experience, ample opportunity to apply skills being learned in meaningful contexts, and a wide variety of teaching methods.

- **Appropriate staffing.** Teachers are more likely to be able to accommodate the diversity of experiences, backgrounds, languages, and interests of their pupils if their classes are small, or if they have the services of a qualified full-time aide. Having two adults in each class makes it easier to staff classes with speakers of more than one language. Low child/staff ratios provide teachers with the opportunity to spend unhurried time with every child, to address each child's unique needs, and to develop good relationships with parents.

- **Age considerations.** The National Association for the Education of Young Children's Position Statement on School Readiness points out that contrary to what is commonly assumed, there are no tests by which to determine reliably whether a child is "ready" to begin school. "Therefore, the only legally and ethically defensible criterion for determining school entry is whether the child has reached the legal chronological age of school entry" (p.22). Some schools and districts are experimenting with mixed-age grouping as a way of reducing grade retention rates, and encouraging children to help each other in all areas of learning (Katz & others, 1990).

Realizing the goal of having all our children ready for school and all our schools ready for the children by the year 2000 will require the best efforts of all involved: parents, teachers, administrators and everyone in the community who has a stake in the welfare of its children.

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Preparing Children With Disabilities for School

by Dianna Pinkerton

"All disadvantaged and disabled children will have access to high quality and developmentally appropriate preschool programs that help prepare children for school." (National Goals for Education: from Goal 1)

How Does the Federal Government Support Readiness for Children With Disabilities?

P.L. 99-457, the 1986 Amendments to the Education of the Handicapped Act (EHA), address the needs of young children with disabilities through two programs: the Handicapped Infants and Toddlers Program for children birth through age 2, and the Preschool Grants Program for 3- to 5-year-olds. Together these programs represent an important effort to expand the scope of services available to the nations's youngest children with disabilities and their families. The Handicapped Infants and Toddlers Program, Part H of the EHA, supports the planning, development, and implementation of an interagency system of early intervention services for infants and toddlers who have disabilities. The Preschool Grants Program, Section 619 of Part B, of the EHA, is designed to insure the availability of a free, appropriate, public education for all children ages 3 to 5 with disabilities. Both programs provide federal support for meeting Goal 1 of the National Goals, "By the year 2000, all children in America will start school ready to learn." During the 1988-89 school year, it was estimated that approximately 451,600 children were served through these programs (Twelfth Annual Report to Congress, 1990).

What Special Problems Do Children With Disabilities Face as They Make the Transition From Preschool to the General School Setting?

The transition from preschool to school can be difficult for a child with disabilities. The preschool environment characterized by small groups and individual attention is replaced by classrooms with more children, fewer adults per child, and greater demand for adapting to general classroom procedures and for working independently (Carta, Atwater, Schwartz, & Miller, 1990). Parents and teachers from both receiving and sending programs need to be involved in placement as well as in scheduling and facilitating the move (Fowler, Schwartz & Atwater, in press). P.L. 99-457 recognizes the importance of preparing children and their families by requiring that specific steps be addressed in each child's Individualized Family Service Plan (IFSP) for children from birth through 2 years or Individualized Education Program (IEP) for preschool children.

What Role Do Families Play?

Family members play a key role in providing information about the child's abilities, strengths and weaknesses, and interests. Parental insights complement information obtained from preschool sources and provide a broader picture of the child's capabilities and needs. Identifying specific ways for parents to be involved in the process is essential to a good transition (Bernheimer, et al, 1990).

Parents may act as teachers, partners, decisionmakers and/or advocates (Shearer & Shearer, 1977). They are teachers when they reinforce the skills acquired in preschool, partners when they communicate needs with school personnel and decisionmakers when they participate in the IEP process. Parents can help prepare the child for the transition to public school by maintaining and generalizing skills necessary for the transition. They also serve as a bridge between the two programs, visiting the new program with their child, helping the child to become familiar with the new setting and discussing concerns and fears connected with the upcoming change. They can also help bridge the gap by arranging visits with former preschool friends and teachers as well as with new classmates. Parents can help their child develop skills in following directions, playing independently, attending to task, and self-care. These skills will help prepare the child for the new setting. (Hains, Fowler, & Chandler, 1988).

What Role Do Teachers Play?

Sending and receiving teachers each play important roles in the transition process. Teacher attitudes, instructional priorities, and communication with parents and other members of the transition team will determine the quality of the child's transition (Hains, et al, 1988). Sending and receiving teachers may have different goals and priorities,

but they play complementary roles in preparing the child for the move from preschool to the general school setting.

The sending teacher should find out what skills the child will need in order to function adequately in the new setting, and implement a program for preparing the child to develop those skills. Familiarity with the receiving program is essential in order to design an appropriate transition curriculum. The sending teacher can gain a better understanding of prerequisite skills by visiting the receiving classroom. For children placed in an integrated setting, behavioral requirements for successful functioning have been assessed and are referred to as "survival skills." These survival skills include being able to function independently during group instruction, following classroom routines, completing tasks within an allotted time period, and working in the absence of teacher direction. Teaching survival skills as part of the preschool curriculum helps prepare the child for the demands of the general school setting (Carta, Atwater & Schwartz, 1991).

The success of the transition preparation is ultimately determined by the child's adaptation to the new environment. The receiving teacher's attitude toward and experience with children with disabilities may be factors in the success of the child's placement. Some flexibility will probably be required on the teacher's part in order to adjust expectations and adapt to the child's special needs. The sending and receiving teachers will have the continuing role of acting as liaisons between programs and with parents. Good communication and clearly defined goals will facilitate the preparation for the child's move from preschool to the general school setting.

What Are the Elements of a Successful Transition Process?

The Capstone Transition Process (Johnson, Cook, & Yongue, 1990) is one model that provides clear guidelines for the transition process. The first activity initiates long-range planning by establishing a "Transition Timeline." This timeline serves as a guide for accomplishing transition activities and can be set up in chart form to track activities. The Capstone Transition Process addresses specific activities beginning 12 months before the move to a new program. The process includes preparation, implementation, and evaluation activities. The initial steps of the process are designed to prepare the participants for their role in the transition. Steps include notifying and preparing parents and teachers from both the sending and the receiving programs. Data regarding the child's needs are collected or updated. A profile of communication procedures, available services, prerequisite skills, and teacher expectations is developed from existing information. The preparation phase of the process culminates with the development by the transition team of an Individualized Education Program (IEP) for use as the basis of educational programming in the new setting. Following the IEP meeting, the timeline provides reminders for the transfer of information and records to the receiving program. The final step calls for the evaluation of the process' effectiveness.

Capstone Transition Timeline

- Develop transition timeline.
- Notify appropriate administrators of students approaching transition.
- Inform parent(s)/primary caregiver(s) that the child will be transitioning and collect information on family transition needs.
- Determine communication policy of potential receiving program(s) and obtain description of program(s).
- Obtain information from teacher(s) in potential receiving program(s) regarding program/classroom overview, skills perceived as important for transition into classroom.
- Verify the receipt of transition information and/or follow-up request for transition information or additional information.
- Reevaluate, verify assessment and eligibility.
- Prepare parents for transition planning meeting.
- Hold transition planning meeting.
- Hold IEP meeting. Obtain permission from parents to release information.
- Provide information to all transition team participants.
- Link parent/primary caregiver of child transitioning with a parent/primary giver of a child already attending new program.
- Send receiving program all pertinent records and verify the receipt of the records.
- Provide receiving program with information about the child's current program.
- Evaluate the process' effectiveness after completion.

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Goal 2: High School Completion

By the year 2000, the high school graduation rate will increase to at least 90 percent.

Objectives

- The nation must dramatically reduce its dropout rate, and 75 percent of those students who do drop out will successfully complete a high school degree or its equivalent.

- The gap in high school graduation rates between American students from minority backgrounds and their nonminority counterparts will be eliminated.

Meeting the Goals of School Completion

by Joseph C. Grannis

The President's National Education Goals call for increasing the high school graduation rate to at least 90 percent by the year 2000. Seventy-five percent of the students who do drop out will be expected to return later to complete a high school degree or its equivalent, and the gap in high school graduation rates between American students from minority backgrounds and their nonminority counterparts will be eliminated.

By 1985, more than 90 percent of the new jobs in the economy were in the highly skilled service area. Because a high school diploma or certificate is increasingly necessary for obtaining employment that can support a family, provide health care, and advance education and personal growth, the school completion goal is critical.

Youth Demographics

Between 1968 and 1989, the proportion of persons aged 16 to 24 in the United States who were not currently enrolled in school and had a high school diploma or an equivalency certificate increased from 84 to 87 percent. The rate for whites changed from 85 to 88 percent, with virtually all of the gain accounted for by females. A major improvement was made by African Americans: from 73 to 86 percent. However, the rate for Hispanic Americans fluctuated around 70 percent, with no long-term trend toward improvement.

While African Americans are still completing high school at a lower rate than whites, when adjusted for differences in family background (e.g., family income and structure, religiousness), their completion rate is at least equal to that of whites. Lower graduation rates for Hispanic students reflect both lower income and language difficulty. Native Americans complete school at the lowest rate. The proportion of noncompleters of all races is very much higher in central cities (Frase, 1989).

Essential Characteristics of School Completion Programs

In the hundreds of dropout prevention and recovery programs now in place, students' engagement in their education and school has emerged as the bottom line. Four categories of program characteristics, identified by Natriello, Pallas, McDill, McPartland, and Royster (1988), can be seen as essential to promoting this engagement.

Relevance of school invokes the connection between education and employment that is the most cited reason for concern about school completion rates. Part-time and summer jobs that provide needed income, *if* linked with academic and other social supports, can contribute to staying in school, especially for students in central cities. The education-work connection has been fostered in a number of high schools, alternative schools within high schools, and even middle schools. Participation of local business partners in these programs, as sponsors, tutors, or mentors, has been vital both to provide a valid knowledge and materials base and to involve adults from the work sector in the schools.

Academic success is essential to school completion, but it is also the area in which there is the most disagreement about how the schools should proceed. Classes must be relevant to students' interests, but they should promote higher-order thinking, and they should provide good preparation for further study and employment, not least through science and mathematics, for females as well as for males. The best dropout prevention is success in the early grades, but the high schools have to accommodate the students they receive. Retention in grade greatly increases the likelihood of later dropping out, yet promotion on social grounds alone also puts students at risk. Limited-English-proficient (LEP) must use their native language to learn, yet they must strengthen their use of English.

Impressive student gains from a number of comprehensive, high-intensity programs in preschool and the elementary grades support increasing early educational investment. At the same time, the transitions into middle school and high school must be carefully articulated between the sending and the receiving schools. Hands-on activities, cooperative learning, multi-media environments, especially utilizing computers, and independent learning contracts have been found to be more engaging than conventional workbooks and recitation.

Students' positive experience of the school environment affects their commitment to school at least as much as the academic curriculum does. Because positive relationships with teachers and with pro-school peers are more difficult

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to establish in a "large" school (i.e., one with 600 students or more), mini-schools or schools-within-a-school have become increasingly common. Administrators with positive regard for staff, students, and parents are essential to a safe and responsive environment, as are teachers whose interactions are sensitive to students' and parents' characteristics.

Schools with more co-curricular or extra-curricular activities tend to have lower dropout rates. Peer tutoring, and perhaps even more, older students' tutoring and mentoring younger students or pupils in the elementary grades, have increased school persistence and achievement of the tutors as much as the tutees. Also, student training for and participation in peer-mediated conflict resolution teams have reduced student suspensions for fighting.

School accommodation to outside factors that can cause students to drop out is essential. Counselors can help students marshal their own and outside resources. Home outreach can mobilize parents' support for their children's attendance and achievement, as well as throw light on the students' behavior in school. Outreach by school staff, especially teachers and counselors, may demonstrate to alienated parents the school's commitment to their children and promote the parents' valuing of education.

Flexible scheduling and programs outside the regular school hours and months have made it possible for students to combine work and family responsibilities with persisting in school. Increasingly, it is being recognized that students may need more than 4 years to complete high school, whether at school or through a General Equivalency Diploma (GED) program. Since girls frequently drop out because they become pregnant, an effective program provides education and support both for them and their infants. Finally, coordination between the school and other social agencies is needed to support the welfare of students, particularly where students are homeless.

Goals and Accountability

The four characteristics of successful programs need to be coordinated for a school program to substantially reduce dropping out. Effective programs also require versatile student record systems to keep track of individual students, to profile how different groups of students are faring, and to transfer records from one school and school system to another. Since dropping out is strongly predicted by certain student variables, such as overage or retention in a previous grade, low attendance, and failing grades, targeting students for dropout prevention may be useful. However, targeting has also been strongly associated with labeling and tracking students. A program mix of homogeneous and heterogeneous classes, a comprehensive advisory system, and regular staff conferences may allow an appropriately differentiated approach to students' needs.

School districts, like schools, must hold themselves accountable for dropout rates, but since there is a great variation between schools *within* programs or districts, programs must be adapted to individual schools. Teachers and school-level administrators must be included in the designing of a program in order to fit it to local needs and be committed to its outcome. Districts can provide significant resources and create accountability frameworks for the individual schools.

While it is relatively easy to show short-term student retention, long-term persistence and academic improvement at a rate that can lead to a diploma in a reasonable span of time are objectives that would challenge many schools and districts. And while schools alone might narrow the gap, and are once again being asked to take the lead, only by attacking social problems such as poor health and housing, unemployment, and job discrimination on all fronts can the goal of school completion be substantially achieved.

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School Completion 2000: Dropout Rates and Their Implications for Meeting the National Goal

by Craig Howley and Gary Huang

The second goal adopted at the 1990 Education Summit aims to increase the high school graduation rate to 90 percent by the year 2000. To interpret this goal and to work toward it, educators and policymakers need current data on school completion and early school leaving. What is a "dropout"? What is the extent of early school leaving? How does the dropout rate vary among different groups and regions? Finally, what do available data imply about possible strategies for meeting the goal? This digest draws on recent studies to answer these questions.

Definitions and Data: Understanding School Completion

Much confusion about early school leaving stems from the variety of definitions attached to the phenomenon. Without consistent definitions and consistent efforts to collect comparable data, attempts to monitor progress toward meeting the national goal will founder. Systematic research into the phenomenon of early school leaving will also be more difficult. To respond to such concerns, Congress directed the National Center for Education Statistics (NCES) to provide an annual report on dropout and completion rates (Public Law 100-297). Thus far, NCES has issued two such reports (Frase, 1989; Kaufman & Frase, 1990). These reports discuss three types of dropout rates, each revealing different, but related, aspects of the phenomenon (cf. Frase, 1989, p. x).

- **Event rates** report--within a single year--the *percentage of students* who left high school without receiving a diploma. These rates reflect the actual "event" of dropping out.
- **Status rates** report--at a given point in time--the *percentage of the population* of a given age range who have not finished high school and are not enrolled. These rates reflect the current "status" of a given group in the population at large (not just students).
- **Cohort rates** report--over a given period of time--what happens to *a single group of students* (for example, all those who were in grade 8 in 1988). These rates can reflect changes that affect a given group over time.

Status and cohort rates provide a view of completion, since they can reflect what happens to students *after* they leave school. Event rates concern only the actual act of dropping out in a given year. The two NCES reports provide comparable data only for event and status rates. In the sections that follow, data on status rates are the primary focus of discussion.

Historical Trends in Dropout and School Completion Rates

The national status dropout rate, measured for the group aged 16 to 24, has generally *declined* in the last 20 years. In this age group, the status rate went from 16 percent in 1968 to less than 13 percent in 1989. Event rates for the nation as a whole showed a similar decline (from about 6 percent in the late 1970s to 4.5 percent in 1988). In 1989, about 4 million persons in the United States aged 16 to 24 were high school dropouts (Kaufman & Frase, 1990).

High school completion rates (the focus of the national goal) reflect the proportion of an age group who have either graduated or received a high school equivalency certificate. These rates, too, have changed in recent decades, with improvement among older age groups.

- Among those aged 18 to 19, the completion rate has *declined*, from 73.3 percent in 1970 to 71.6 percent in 1989 (in 1986 it had reached a high of 74.6 percent).
- Among those aged 20 to 21, the completion rate has been rather *stable*, hovering near 82 or 83 percent from 1970 to 1989.
- Among those aged 22 to 24, the completion rate has *increased*, from 81.9 percent in 1970 to 86.0 percent in 1989.
- Among those aged 30 to 34, there is a *pronounced increase*: from 73.0 percent in 1970 to 86.6 percent in 1989.

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Part of this trend can be attributed to the effect of high school equivalency programs, in which older persons participate more than younger persons.

Variability Among Central City, Suburban, and Rural Areas

Differences in dropout rates exist among youth in central cities, suburban, and rural areas. The 1987-1989 average *status dropout rate* for 16- to 24-year-olds was 15.4 percent in central cities, 12.6 percent in nonmetro areas, and 10.7 percent in suburban areas. The 1987-1989 average *event dropout rate* also was highest in central cities (6.2 percent), followed by nonmetro areas (4.0 percent), and was lowest in suburban areas (3.7 percent) (Kaufman & Frase 1990).

The variability in dropout rates associated with place of residence, however, also is related to variability among ethnic groups. For example, the event dropout rate among African-American youth in *central cities* is about 8.5 percent--significantly higher than the 5.3 percent rate among central-city white youth. Curiously, the *suburban* setting seems to be associated with slightly higher dropout rates among Hispanic youth, whose event dropout rates were 7.8 percent, 8.3 percent, and 7.0 percent, respectively, for central city, suburban, and rural areas.

Variability Among Ethnic Groups

Measured by either event or status rates, Hispanic youth have the highest national dropout rate, African Americans the second highest, and whites the lowest (these relative positions, however, vary widely by geographic region or metropolitan status; see Kaufman & Frase, 1990). During the period 1987-1989, about 8 percent of Hispanic students dropped out of school each year, an event rate almost twice as high as that for whites (about 4 percent). Close to 7 percent of black students dropped out of school each year in the same period.

Computed as status rates, data on dropouts give a somewhat different picture. In October 1989, among the population aged 16 to 24, 33 percent of Hispanics had not completed high school, while only about 14 percent of African Americans and 12 percent of whites were in this category (Kaufman & Frase, 1990).

Meeting the School Completion Goal

Four general implications can be drawn from the available baseline data developed by NCES.

First, if high school completion is a minimum level of attainment (Bishop, 1991; Mincer, 1989), then, generally, the earlier a student masters a high school curriculum, the better. Those who complete high school in their late 20s or 30s (or later) miss opportunities that would otherwise be open to them. This is a situation captured by status dropout rates, but not by event rates.

Second, putting the national goal into measurable form requires development of indicators pegged to progress among particular age groups and reflected in particular statistics. Early in 1991, the National Educational Goals Panel (NEGP)--charged with monitoring progress toward the goals--recommended use of five national indicators and three state-by-state indicators. These indicators, including event, status, and cohort rates, may be used for the first progress report, due in September 1991 (NEGP, 1991).

Third, despite the apparent need for improvement among all ethnic and regional groups, it is clear that meeting the national goal is an issue of educational equity. Since the numbers of Hispanics and African Americans in the general population are increasing, if substantial improvement in Hispanic and African American dropout rates does not take shape, the goal will probably not be met.

Fourth, policies that respond to the situation of particular regions and ethnic groups--within an overall concern for general improvement--may well be warranted.

Summing It Up

At present, 86 percent of persons aged 22 to 24 complete a high school diploma (either by graduating or completing an alternative certificate). By contrast, only 68 percent of persons aged 18 to 19 graduate "on schedule" from high school with a regular diploma. Some in this latter group, however, complete equivalency diplomas.

The national data mask the different rates of early school leaving among different regions and ethnic groups. Measuring progress toward the national goal will require the development of an indicator or array of indicators. In addition, policies will need to respond to the regional and ethnic diversity that characterizes the phenomenon of early school leaving.

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Promising Strategies for At-Risk Youth

by Alan Baas

When President Bush, in concert with the nation's governors, named a 90 percent high school graduation rate by the year 2000 as one of six national education goals, he gave official recognition to a groundswell of school–community efforts over the last decade that have sought to deter "at-risk" youth from dropping out of school. Those at risk tend to be among the "disadvantaged": from families at or below the poverty level and members of minority groups. Thus a solution to the dropout problem is inseparably tied to waging a war against poverty. The stakes are clearly high, and the solutions involved may stimulate far-reaching, systemic educational change.

Common Characteristics

Both the American Association of School Administrators (Brodinsky and Keough, 1989) and the National School Boards Association (McCormick, 1989) have published reliable overviews of the problem. Many other authors have scrutinized exemplary programs to distill the elements applicable to other schools and cities. Findings include:

- Begin prevention early—in kindergarten or first grade. Dollars spent on early intervention can yield up to a six-fold savings in potential "dropout" costs.
- Aggressive leadership by school boards, superintendents, principals, and teachers is needed to make things happen.
- Parents are crucial. Incorporate them any way you can.
- Specific solutions must be school-based, rather than delivered from above, and should be woven into a comprehensive K–12 program (Hamby, 1989).
- Remedial programs are out. Rather, stress high ethical and intellectual standards matched to realistic, attainable goals. Offer an "alternative strategy *for* learning, not an alternative *to* learning" (Conrath, 1989).
- Teachers and principals need training, encouragement, and "empowerment" to become active decisionmakers and to act to adapt strategies to meet each student's specific needs (Levin, 1987).
- Teaching should focus on continuous progress in language skills and emphasize problem-solving and teamwork. Teachers need to be tough, compassionate, and professional. They also need to know how to relate to their students' cultures (McCormick, 1989).
- Classes and, when possible, schools, need be smaller to increase one-on-one contact with students.
- Districts and state departments of education should serve as resources and encourage local-level decision-making. Principals should be freed from bureaucratic tasks to work with teachers and students (Levin, 1987).
- Students should never be allowed to disappear into anonymity. The school environment should be a place in which students are esteemed for their unique abilities and strengths (Hamby, 1989).
- Educators and communities should integrate their services and goals with those of the basic social and health services (Wehlage et al., 1989).
- School leaders need to mobilize the entire community—service groups, businesses, and senior citizens may provide extra funding, resources, and volunteers to work with students (Slavin et al., 1989).

The following sections describe three representative successful programs.

Accelerated Schools

The Accelerated Schools Program (ASP) developed at Stanford University by Henry Levin and his associates (1991, 1990, 1987) has been replicated in more than fifty schools, most notably in a network of Illinois schools (Illinois Network of Accelerated Schools, 1988). ASP accelerates learning so that students are able "to close the achievement gap and perform at grade level by the time they leave sixth grade" (Levin and Hopfenberg, 1991).

Bringing children into the educational mainstream means "more than bringing them up to grade level in basic skills measured by standardized tests," Levin adds. It also includes "capabilities in problem solving and communication as well as their educational aspirations and self-concept as learners." A key ASP concept is the "unity of purpose" that encourages local school staff and parents to "take responsibility for the educational outcomes of at-risk students by providing the resources, expectations, and empowerment to make educational decisions on behalf of such students" (Levin, 1987).

Operational decisions rely heavily on small group task

forces and a schoolwide steering committee with extensive parental training and involvement skills. Parents must affirm their children's educational goals; watch their health, sleep, and study patterns; talk with them regularly about their schoolwork; and be truly interested. When necessary, services for parents should include adult basic education. Instructionally, ASP is "constructed on the strengths and culture of the children with a heavy reliance on interesting applications, problem solving, active and 'hands-on' learning approaches, and an emphasis on thematic learning that integrates a variety of subjects into a common set of themes" (Levin and Hopfenberg, 1991).

New Futures

The Annie E. Casey Foundation's New Futures Initiative addresses "the failure of community institutions to do what they can do to equip youngsters with the expectations, opportunities, supports, and incentives they need to become aspiring, responsible and successful adults" (Annie E. Casey Foundation, 1989). The foundation currently provides between 1 and 2.5 million dollars annually to five cities plus smaller grants to two additional cities to fund New Futures Programs to restructure community institutions so that they can better meet the needs of at-risk youth.

Each program begins by establishing a community partnership (Wehlage et al., 1989) to increase school achievement, reduce dropout and pregnancy rates, and increase young adult employment. Success depends on the governing board's ability to identify problems, evaluate current efforts, develop plans, reallocate existing resources, raise money, and settle "turf" issues over service delivery.

Ultimately, Wehlage explains, it is "intended to trigger and sustain a political process which is powerful enough not only to modify the services that institutions provide, but actually redefine institutional objectives as well as how those institutions are held accountable and how they interrelate." Basic features include early intervention, positive incentives for institutions and students, integrated services, increased autonomy, individualized instruction, teacher training and retraining, an enhanced management information system, and case management to ensure that each at-risk youth receives regular, significant contact with a skilled adult.

Success For All

The Success for All (Madden et al., 1989) approach at an inner-city Baltimore elementary school, where 80 percent of the student population is "disadvantaged," reflects the research findings of Robert Slavin and his associates. Built on a commitment to "prevention and immediate, intensive intervention," it strives to provide students with extra help "early, when their problems are small, to allow them to catch up with their classmates."

In the school Madden describes, six tutors are provided for grades K–3. Each tutor works one-on-one with about eleven students per day. The school's half-day preschool and full-day kindergarten focus on developing students' language skills. Continuity between the classroom and the students' outside lives is attended to by a Family Support Team consisting of two social workers and a parent liaison. This team makes home visits and referrals to outside agencies and involves parents in school activities. A program facilitator works with the principal, district resource people, and community volunteers. Detailed teacher manuals coupled with inservice training reinforce the steady, consistent "commitment to success for all."

It's a Solvable Problem

The literature supports this key to dropout prevention: think positively and act accordingly with vigor. Identify your population's characteristics. Examine your district's management information system and use its resources to gather solutions for your particular problems. Pick solutions that you can commit yourself to.

Get the commitment rippling outward. Make the challenge and your goals public and never stop reminding the community of its stake in what you are doing. Solutions will cost more money than is typically available to schools. Help your community understand this and identify ways in which it can help. There are as many ways to face this challenge as there are creative, committed individuals who care about our nation's children.

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Middle School Education— The Critical Link in Dropout Prevention

by Amy Stuart Wells

A student's decision to drop out of high school is often the end result of a long series of negative school experiences--academic failure, grade retention, or frequent suspensions--that begin before the ninth grade. Dropout prevention strategies, therefore, must be targeted at the middle school grades, when the stresses of schooling related to a more complex curriculum, a less personal environment, and the growing need for peer acceptance pose grave danger to already disadvantaged students (Massachusetts Advocacy Center, 1988).

Even though research demonstrates the importance of middle schools in retaining at-risk students, the organization and curriculum of most do not meet the needs of young adolescents, who are going through a tumultuous period of rapid physical development and emotional turmoil.

Creating Smaller Schools Within Middle Schools

Part of the problem in trying to restructure middle-grade education is that intermediate schools come in a variety of different sizes and shapes. As many as 30 different middle-school grade configurations have been identified (Center for Research on Elementary and Middle Schools, CREMS, 1987; 1988). The two most popular are the grade 6-8 middle schools, now found in about one-third of all districts, and the grade 7-9 junior high schools.

Much of the research on improving middle and junior high schools is aimed at making them look less like large, impersonal high schools, and more like caring, nurturing elementary schools, while still offering students a challenging, subject-specific curriculum.

CREMS studies (1988) have shown that while the grade 6-8 middle schools tend to be smaller and less departmentalized than the 7-9 junior highs, close to 50 percent of all seventh graders change classrooms at least four times a day. Thus, at the point in their lives when young adolescents are feeling most vulnerable, many are forced to leave their self-contained elementary school classrooms, where they spent most of their day with one teacher and a small group of peers, for large, often impersonal middle schools or junior highs, where daily they attend as many as seven different classes taught by seven different teachers and attended by seven different sets of students (Massachusetts Advocacy Center, 1988).

Increasing Personal Attention

While a more fragmented middle-school structure allows teachers to specialize and be more expert in the subjects they teach, it also leads to weaker teacher-student relationships. As teachers try to deal with 30 different students every hour of the day, they have little time to address students' individual needs. They also have little time to contact parents or discuss student cases with their colleagues. Yet, while less-departmentalized schools allow teachers to form closer relationships with their students, one study found that sixth graders in these situations were achieving at a significantly lower level (CREMS, 1987).

Thus, middle schools, especially those with at-risk students, must address both issues--positive student-teacher relationships and high achievement. Schools can do so by developing intermediate staffing practices, including semi-departmentalized and team teaching arrangements. For instance, one teacher may offer instruction in science and mathematics and share a fixed class of students with other teachers. Schools can also assign staff members to serve as "advocates and mentors" to individual students (CREMS, 1987).

This more personalized setting allows teachers to keep closer tabs on frequently absent students and to work with them and their parents to prevent truancy. The team teaching approach allows teachers to specialize and develop expertise while still being able to network with other teachers to help students with difficulties.

Reforming Grade Retention Policy

Being retained one grade increases a student's chances of dropping out by 40-50 percent; those retained two grades have a 90 percent greater chance of dropping out (Massachusetts Advocacy Center, 1988).

While many students are held back in the early years of elementary school, retention is also quite common in the middle grades when teachers are looking for more specialized knowledge and academic achievement from

their students. Research has shown, however, that retaining middle school students does not improve academic achievement and may in fact signal that schools are not helping students compensate for academic deficiencies that began in elementary school (Massachusetts Advocacy Center, 1986). Meanwhile, young adolescents are more likely to feel embarrassed and stigmatized than elementary students when they are held back.

Eliminating Tracking

Although the practice of grouping students according to ability usually begins in elementary school, it becomes formalized in the middle school grades as the various academic levels become more fixed and obvious. Too often those students with the characteristics associated with potential dropouts--minority status, low-income or single-parent families, limited English proficiency, or behavioral problems--end up in the lowest tracks. Young adolescents placed in lower tracks become locked into dull, repetitive instructional programs leading at best to minimum competencies. Moreover, students who have difficulty in just one subject area often end up in the lower track for all of their classes, keeping them from becoming high achievers in areas in which they excelled in elementary school.

Tracking young adolescents also restricts social interaction between students with different interests and abilities at a time when they are formulating long-lasting perceptions of themselves and their peers. Because minority students are consistently placed in lower level classes, tracking segregates students, reinforcing prejudices and fostering a feeling among young minority students that only whites can be high achievers.

Promoting Cooperative Learning

One possible alternative to tracking in the middle grades is cooperative learning where students of all ability levels work together in groups and receive group rewards as well as individual grades. Cooperative learning is especially appealing for middle grade students because it allows them to develop their interpersonal communication skills at a time when they are particularly focused on social interactions.

In some situations students learn thinking strategies more efficiently from each other than they do from the teacher (Strahan & Strahan, 1988). They respond to each others' ideas, and groups often solve problems more efficiently than students working alone.

Revitalizing the Curriculum

Health education should be an essential component of any middle school curriculum. Health courses need to include everything from instruction on proper nutrition to the effects of alcohol on the body. Also, given that teenage pregnancy is one of the most frequently cited reasons why girls drop out of school, and that the age at which boys and girls become sexually active continues to decline, exposing middle grade students to a complete sex education curriculum could prove to be highly beneficial.

Natriello et al. (1988) stress that providing adolescents with career education increases the salience of the school curriculum by showing students how the skills they are learning today can benefit them in 10 or 20 years.

Improving the Student Teacher Relationship

Much of the research on why students drop out points to negative teacher-student interactions. Likewise, students who stay in school often cite a "good teacher" as one of the most positive elements of their school experience. While adolescents tend to pull away from adults in their attempt to become independent, they paradoxically also have a strong need to bond with them.

Bhaerman and Kopp (1986) found that students are less likely to leave school when they work with teachers who are flexible, positive, creative, and person-centered rather than rule-oriented. Effective teachers should also maintain high expectations for all of their students and show they care about their students' success.

Many middle grade teachers, however, lack adequate training on early adolescence (Carnegie Council on Adolescent Development, 1989). Most are prepared to teach either elementary or high school students, and view their job in the middle schools as a "way station" before going on to assignments that they prefer.

Middle grade teaching is a legitimate, specialized profession. These teachers should be specially trained in adolescent development as well as in a subject area. As they counsel and mentor their students through their middle school years, teachers will be providing a climate that supports and nurtures at-risk students, thus removing much of the school-based impetus for dropping out.

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Goal 3: Student Achievement and Citizenship

By the year 2000, American students will leave grades 4, 8, and 12 having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy.

Objectives

- The academic performance of elementary and secondary students will increase significantly in every quartile, and the distribution of minority students in each level will more closely reflect the student population as a whole.

- The percentage of students who demonstrate the ability to reason, solve problems, apply knowledge, and write and communicate effectively will increase substantially.

- All students will be involved in activities that promote and demonstrate good citizenship, community service, and personal responsibility.

- The percentage of students who are competent in more than one language will substantially increase.

- All students will be knowledgeable about the diverse cultural heritage of this nation and about the world community.

Student Achievement in Core Subjects of the School Curriculum

by John J. Patrick

The six National Education Goals reflect widely held concerns that most Americans have not been receiving the kind of education they need to meet the challenges of 21st century life. This Digest addresses Goal 3: "By the year 2000, American students will leave grades 4, 8, and 12 having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so that they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy."

Deficiencies in Student Achievement

During the 1970s and 1980s, the National Assessment of Educational Progress (NAEP) issued several reports revealing that a majority of students are not developing intellectual capacities necessary for democratic citizenship, lifelong learning, and productive employment in the economic system (Mullis, Owen, & Phillips, 1990). Most students seem to develop basic skills, which involve low-level cognition. However, only 5 to 8 percent of our 17-year-olds demonstrate the ability to solve multiple-step problems, synthesize data, read analytically, and think critically. Furthermore, performance on tasks requiring high-level cognition has declined since the early 1970s.

In a summary of findings from 20 years of NAEP, Mullis, Owen, and Phillips (1990, p. 9) report that "only small proportions of students appear to develop specialized knowledge needed to address science-based problems, and the pattern of falling behind begins in elementary school." A similar pattern of deficiency in knowledge achievement is revealed by the NAEP studies of mathematics, history, literature, geography, and civics. Fewer than 10 percent of 17-year-old students seem to have developed the ability to apply key ideas to tasks that require high-level cognition (Mullis, Owen, and Phillips, 1990). An especially disturbing finding is that high school students did "significantly less well" in civics in the 1988 assessment than their 1982 counterparts (NAEP, 1990, p. 13). Large numbers of students appear to lack knowledge and skills usually associated with responsible citizenship.

The United States ranks near the bottom among economically developed countries on international assessments of students' knowledge of mathematics and science. The gap in achievement between American students and their counterparts in other countries increases as students move through the grades. Fifth-grade students in the United States score near the median among their counterparts in the international assessments; 8th-graders fall markedly below the median; and seniors rank near the bottom in comparison to students from the other countries (Darling-Hammond, 1990).

American respondents also ranked near the bottom in a recent international assessment of geographical knowledge (Salter, 1990). These results are consistent with various other reports of geographic illiteracy among large numbers of American students (Stoltman, 1990).

Factors Associated With Higher Levels of Student Achievement

If Goal 3 is to be achieved by the year 2000, then major improvements in teaching and learning are necessary. The various NAEP surveys of achievement in the 1980s included information on background variables related to education. When related to student performances on the NAEP instruments, these data reveal factors that are associated with higher levels of student achievement. Better performances in the NAEP surveys of achievement have been associated with high educational attainment of parents, a home environment where reading and discussions of ideas are valued, limited television viewing, significant amounts of time spent on homework assignments, and a stable family structure.

The NAEP reports also suggest relationships between systematic, substantial, and stimulating exposure to core subjects and higher scores on tests of achievement in these academic disciplines. Students who reported more opportunities to study key topics and ideas in core subjects made higher scores on the NAEP tests of achievement. Furthermore, students who reported an early start in studying core subjects, through substantial exposure to these content areas in elementary school, tended to perform better in the NAEP surveys.

Another factor associated with higher achievement was active learning. Students who said that their teachers required them to interpret and apply knowledge tended to score much higher than did respondents who reported that their lessons were limited mostly to passive reception of knowledge through lectures and textbooks. For example, students in civics classes who reported participation in mock trials or simulated congressional hearings tended to perform at a higher level on the civics assessment than did students who were not involved in active learning experiences (NAEP, 1990).

A final factor associated with higher achievement in the NAEP surveys was use of electronic technology in teaching and learning the core subjects. Students with access to computers for problem solving, for example, tended to achieve a higher proficiency in mathematics than those who did not use computers.

How To Improve Student Achievement in Core Subjects

Several widely accepted ideas on how to improve student achievement are presented below.

- Increase the quantity and quality of challenging subject matter that all students are required to study in elementary and secondary schools, and encourage more students to pursue advanced coursework.
- Increase the amount of time in which students are systematically engaged in studying the core subjects.
- Provide regular opportunities for in-depth investigations of key topics and problems as an alternative to superficial surveys of subject matter.
- Emphasize active learning, thinking, and doing in response to challenging assignments, rather than passive learning through lectures and textbooks.
- Develop cognitive skills and processes, such as writing, by frequent and systematic practice that involves teaching and learning of underlying processes, such as the dynamics of written composition.
- Use multiple resources and media, including electronic technology, primary documents, classic works of literature, and science laboratories.
- Establish high expectations for student performance based on the assumption that virtually all students can learn at high levels.
- Create a school climate that is conducive to student achievement through strong instructional leadership and a safe, stable educational environment.
- Involve parents in the education process as monitors of homework assignments, encouragers of academic achievement, and reinforcers of school rules.
- Develop assessment instruments that require high-level cognitive skills and processes--applying knowledge to complex problems and issues--instead of testing that emphasizes recall of discrete information.

The Consequences of Improved Student Achievement

Attainment of Goal 3 is associated with the intertwined consequences of preparing students for (1) responsible citizenship, (2) lifelong learning, and (3) productive employment in the "high-tech" global economy of the 21st century.

More than 200 years ago, the founders of the United States recognized the relationship of education to responsible citizenship in a free democratic government. This critical connection between liberty and learning will be even more important in the future, because the complexities of civic affairs and public issues in the 21st century will greatly exceed those of earlier eras.

Preparation for a complex and dynamic future will require citizens with the will and the capacity to learn new ideas and techniques to cope with unforeseen problems. Those who have developed high-order cognitive capacities in their youth will be best equipped to meet new challenges.

Finally, enjoyment of democratic citizenship has always been linked to economic well being. Most jobs in the worldwide economy of the future will require high-level cognitive capacities to operate "high-tech" equipment in the acquisition, organization, and application of information to solve complex problems. Therefore, if Americans are to be successful in the global economic competition of the next century, we must greatly improve the quality of education in our schools.

The United States cannot maintain its constitutional democracy or its economic well being unless all students greatly improve their levels of achievement in the core subjects and development of intellectual capacities.

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Encouraging Writing Achievement Across the Curriculum

by Sharon Sorenson

Proponents of writing across the curriculum are quick to clarify that writing to learn is not the same as learning to write; but as flip sides of a single coin, the two support one another. Anne Walker (1988) calls the two parts the "virtuous circle." When content area teachers incorporate writing in all areas of the curriculum—social studies, math, science, vocational education, business, foreign language, music, art, physical education, and language arts—students benefit in three ways: they have a resource for better understanding content; they practice a technique that aids retention; and they begin to write better (Walker, 1988; Kurfiss, 1985).

How Does Writing Across the Curriculum Help Students?

Across-the-curriculum writing finds its merit in removing students from their passivity. Active learners are active thinkers, and one cannot write without thinking (Steffens, 1988; Walker, 1988). Thus, incorporating writing-across-the-curriculum techniques tends to change the complexion of the classroom. Teacher-centered classrooms become student centered. Rather than the teacher being the Great Dispenser of Knowledge, the teacher becomes a facilitator, aiding students' understanding (Self, 1989; Hamilton-Wieler, 1989). Assuming that students gain new knowledge by making associations with prior knowledge, the writing activities commonly used across the curriculum give students the opportunity to make those connections (Walker, 1988; Self, 1989; Barr and Healy, 1988; Kurfiss, 1985; Steffens, 1988). With the hectic pace of back-to-back 50-minute classes all day, students need the chance to assimilate information, make connections, and face whatever may still confuse them. Hamilton-Wieler (1988) calls this kind of writing "a way into or means of learning, a way into understanding through articulating."

What Kinds of Writing Make Sense Across the Curriculum?

Many writing-across-the-curriculum assignments tend to differ from typical English-class writing assignments (unless the English teacher also incorporates writing-to-learn techniques). Generally, cross-curricular writing activities fall into two groups:

- Expressive writing appears in learning logs, journals, exit summaries, problem analyses, or peer dialogues, and allows the student to write in his/her own vocabulary without fear of being "corrected."
- Product writing appears in more formal products—essays, test question responses, library papers, and lab reports— most like what students have been taught to create in English class.

Given the difficulty of product writing and given the usual initial discomfort of content area teachers in giving and evaluating product writing assignments, models prove useful. Models that illustrate how to tailor a topic to a specific curricular area help students learn how to address purpose in terms of audience. Models that illustrate discipline-specific language help students learn how to prepare a more focused, deeper response (Sorenson, 1989; Winchester, 1987; Hamilton-Wieler, 1988).

How Can Teachers Find Time for Writing?

The biggest stumbling block for teachers is their concern for precious class time and how they can cover the book or meet curriculum requirements if they add yet another component to classroom instruction. Generally, proponents agree that when teachers incorporate writing in their content areas, the need for review and the need for reteaching after testing is sufficiently reduced to more than make up the difference. And since expressive writing should never be graded—especially not for grammar or mechanics—teachers do not suffer from increased paper load (Worsley & Mayer, 1989; Hightshue, 1988; Self, 1989).

Does Writing Across the Curriculum Improve Student Performance?

While hard statistical evidence is scarce, a few studies show positive results. In one study, low-achieving math students using writing-to-learn techniques improved their state competency test results to a greater percentage than did average math students in a traditional classroom (Gladstone, 1987). A physics teacher saw a steady 3-year improvement in overall grades when writing-to-learn

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techniques were incorporated (Self, 1989). Other studies, admitting a lack of hard evidence, nevertheless found attitudinal shifts among students (Winchester, 1987). Most students experienced less apprehension about writing and felt they were better writers—writing more varied, more complex, and more mature pieces—after only a year in a schoolwide writing-across-the-curriculum project.

Most importantly, however, research supports that writing to learn improves higher-order reasoning skills (Gere, 1985). As Barr and Healy (1988) summarize the research, a "study of writing achievement across the curriculum attests to the fact that writing improves higher-order reasoning abilities. WAC programs are ideally suited [to achieve these ends,] for they provide the theoretical base for teachers and the instructional strategies that enable students to reformulate ideas from text."

What Kind of Staff Development Has Been Successful?

Some school administrators say they have a writing-across-the-curriculum program "housed in the writing lab." Others say the program is evident in their school newspaper or literary magazine. Still others suggest that writing across the curriculum happens when the English teacher asks students to write a paper about art or the art teachers refer to literature. These examples lack the ingredients of writing across the curriculum (Walker, 1988; Self, 1989).

When teachers from all content areas incorporate writing activities on a nearly daily basis in all classes, then writing-across-the-curriculum techniques are in place. In order for that to happen, however, teachers need a great deal of preparation. Most teachers outside the university feel uncomfortable as writers, even writing about their own curricular areas. They feel even less comfortable 'evaluating' writing. And some resentment almost always arises over "doing the English teacher's job" (Walker, 1988).

To overcome these problems and address the issues—in short, to make teachers comfortable—most school districts have found a year-long plan for inservice and group dialogue necessary for a successful program. In many cases, participation has been voluntary (Winchester, 1987; Self, 1989), but the rewards have come when participants, observing the enthusiasm and classroom success, have asked for information. In other cases, participation has been mandatory (Self, 1989), but there is some question about a teacher's success if he or she is an unwilling participant.

Barr and Healy (1988) argue that "Schools succeed when the emphasis, by both teachers and students, is on writing and thinking about relevant and significant ideas within the subject areas." Writing across the curriculum accepts writing, the need to develop it, and its role in learning as a human function essential to thinking and communicating.

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Achievement of Knowledge by High School Students in Core Subjects of the Social Studies

by John J. Patrick

During 1990, the National Assessment of Education Progress (NAEP) reported findings about elementary and secondary school students' knowledge of U.S. history, geography, and civics. In 1988, the Joint Council on Economic Education reported findings about its national study of high school students' knowledge of economics. These assessments propose to measure knowledge students should have learned through involvement with the social studies curriculum in elementary and secondary school. The synthesis of findings in this Digest, however, is restricted to 11th and 12th graders--to students who have completed most, if not all, of the school's social studies curriculum. What do they know about core subjects of the social studies--U.S. history, geography, economics, and civics--after completion of most of their coursework?

High School Students' Knowledge of U.S. History

Most upper-level high school students reveal serious gaps in their knowledge of major events and themes in U.S. history. In a 1986 assessment, eleventh-grade students responded to 141 multiple-choice items in sixteen categories (e.g., the Constitution, civil rights, women in history, labor and industry, geography, and international relations). The average score was 54.5 percent.

The second national assessment of knowledge of history (reported in 1990) confirmed the findings of the first survey. The overall results of a trend study indicated essentially "no change from 1986 to 1988 in the high school juniors' factual knowledge of U.S. history" (NAEP 1990d). A national sample of twelfth-grade students, who also participated in the second history assessment, performed generally at the same low level as did the eleventh-grade respondents. About half of them lacked understanding of key historical terms, fundamental primary documents, and significant relationships among facts and ideas in U.S. history. More than half of these respondents, for example, were ignorant of main ideas in the Declaration of Independence, the Constitution, and the Bill of Rights, and of their applications to issues in American history.

High School Students' Knowledge of Geography

A similar pattern of generally poor performance occurred in the national assessment of geographic knowledge (NAEP, 1990c). The 76-item test measured knowledge of four topics: knowing locations, using geography skills and tools, understanding cultural geography, and understanding physical geography. Overall, the national sample of twelfth-grade students answered only 57 percent of these items correctly. Average scores for the four topics ranged from 53 percent correct on geographic skills and tools to 60 percent correct in the cultural geography category.

Very few of the respondents had taken a high school course in geography. Most of them, however, had been exposed to some geography content in their history and science courses. Students whose American history courses included substantial treatment of geography performed better than the others on this assessment.

High School Students' Knowledge of Economics

High school students performed about as poorly in a Joint Council on Economic Education survey as similar respondents did in the NAEP tests of knowledge of history and geography. An assessment of 8,205 eleventh- and twelfth-grade students in private and public schools in 33 states revealed vast ignorance of key economic concepts, such as gross national product, inflation, monetary policy, and opportunity costs (Walstad & Soper, 1988).

Respondents who had completed a high school course in economics had a mean score of only 52 percent correct on the Test of Economic Literacy. Students in social studies courses that included economics content had an average score of 48 percent. Students in social studies courses without economics content averaged 37 percent correct. The greatest deficiency among all groups was lack of knowledge of macroeconomics concepts.

High School Students' Knowledge of Civics

By contrast to the assessments in other core subjects, a mixed picture of student achievement was revealed by the

measurement of knowledge in civics (NAEP, 1990b). The 144 items in this test were grouped into four categories: (1) democratic principles and the purpose of government, (2) structures and functions of political institutions, (3) political processes, and (4) rights, responsibilities, and the law. The highest mean score in any of the four categories was 78.9 percent correct on rights, responsibilities, and the law. Students tended to be well-informed about constitutional rights of persons accused of a crime and about the legal exercise and limits of free expression. The were markedly less informed about the sources of their civil liberties and rights in events and documents of the founding period of American history.

Mean percentages in three other categories of this test were rather low: category 1--61.4, category 2--63.6, and category 3--64.5. In particular, only about half of the twelfth-grade students demonstrated an adequate understanding of specific principles of constitutional democracy in the United States, such as federalism, separation of powers, and checks and balances, and of their applications in institutions and processes of government. A disturbing finding was that upper-level high school students did "significantly less well" in civics in the 1988 assessment than their 1982 counterparts (NAEP 1990b, 13).

Factors Associated with Higher Achievement

Better performances in the NAEP studies about civics, geography, and history were associated with educational attainment of parents, a home environment where reading and information are valued, a stable family structure, limited television viewing, and regular performance of school assignments at home. The NAEP studies also suggested relationships between classroom lessons involving utilization of knowledge and higher level performances on tests of knowledge in civics, geography, and history. For example, students who said their teachers required them to interpret and apply knowledge to the completion of tasks tended to score much higher on these assessments of knowledge than did respondents who reported that their lessons were limited mostly to reading and recalling the contents of textbook chapters. Students in government and civics courses who reported participation in mock trails or mock congressional hearings tended to perform at a higher level on the civics assessment than did students who were not involved in these kinds of activities.

Factors associated with higher scores on the Test of Economic Literacy were the teacher's knowledge of economics and the teacher's access to curriculum resources and ongoing programs of in-service education in economics. Students with higher scores on the Test of Economic Literacy tended to have teachers with more completed coursework in economics. This relationship prevailed not only for teachers of separate courses in economics, but also for teachers of other subjects, such as history or government, who infused economics into their courses. Further, there was a positive relationship between teachers in school districts with strong in-service education in economics and students with higher scores on the Test of Economic Literacy.

In general, systematic and stimulating exposure to fundamental knowledge in the core social studies subjects--history, geography, civics, and economics--is associated with higher scores on tests of knowledge in these academic disciplines. Students who reported more challenging contacts with key topics and ideas made higher scores on the tests of knowledge. One might also hypothesize that students' general lack of knowledge, as exhibited by the recent national assessments, diminishes their ability to develop and use skills in deliberation, discourse, critical thinking and decision making--all of which are basic attributes of exemplary citizenship in a constitutional democracy. It would seem, for example, that students with little knowledge of the origins and development of the U.S. Constitution would be unlikely to achieve proficiency in analysis and appraisal of issues about constitutional rights. Moreover, it would seem that students who lack knowledge about civic participation would not be likely to have either strong orientations to or skills in this fundamental facet of democratic citizenship.

Conclusion

The overall achievement of upper-level high school students in the core subjects of the social studies is dismal. Less than half of these students graduate with in-depth knowledge and understanding of history, geography, civics, and economics. Fewer than ten percent appear to have the ability to use social studies knowledge to complete higher order intellectual tasks. A review of findings from twenty years of NAEP concludes: "The current levels of student achievement are unacceptably low for our country's needs and aspirations and for the personal goals of its citizens" (NAEP 1990a, 29). There is obviously a continuing need for substantial improvement in the teaching and learning of core social studies subjects.

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Fostering Academic Creativity in Gifted Students

by E. Paul Torrance and Kathy Goff

What Is Meant by Academic Creativity?

Academic creativity is a way of thinking about, learning, and producing information in school subjects such as science, mathematics, and history. Few experts agree on a precise definition, but when we say the word, everyone senses a similar feeling. When we are creative, we are aware of its special excitement.

Creative thinking and learning involve such abilities as evaluation (especially the ability to sense problems, inconsistencies, and missing elements); divergent production (e.g., fluency, flexibility, originality,and elaboration); and redefinition. Creative learning is a natural, healthy human process that occurs when people become curious and excited. In contrast, learning by authority requires students to use thinking skills such as recognition, memory, and logical reasoning--the abilities most frequently assessed by traditional tests of intelligence and scholastic aptitude. Children prefer to learn in creative ways rather than just memorizing information provided by a teacher or parents. They also learn better and sometimes faster.

Three questions illustrate the difference between learning information provided by an adult or textbook and creative learning:

1. In what year did Columbus discover America? (The answer, 1492, requires recognizing and memorizing information.)

2. How are Columbus and an astronaut similar and different? (The answer requires more than memorization and understanding; it requires students to think about what they know.)

3. Suppose Columbus had landed in California. How would our lives and history have been different? (The answer requires many creative thinking skills including imagining, experimenting, discovering, elaborating, testing solutions, and communicating discoveries.)

Creative Behavior of Young Children

Young children are naturally curious. They wonder about people and the world. By the time they enter preschool, they already have a variety of learning skills acquired through questioning, inquiring, searching, manipulating, experimenting, and playing. They are content to watch from a distance at first; however, this does not satisfy their curiosity. Children need opportunities for a closer look; they need to touch; they need time for the creative encounter.

We place many restrictions on children's desire to explore the world. We discourage them by saying "Curiosity killed the cat." If we were honest, we would admit that curiosity makes a *good* cat and that cats are extremely skilled in testing the limits and determining what is safe and what is dangerous. Apparently children, as well as cats, have an irresistible tendency to explore objects, and this very tendency seems to be the basis for the curiosity and inventiveness of adults. Even in testing situations, children who do the most manipulating of objects produce the most ideas and the largest number of original ideas.

Creative Behavior of School-Age Children

Until children reach school age, it is generally assumed that they are highly creative, with vivid imaginations, and that they learn by exploring, risking, manipulating, testing, and modifying ideas. Although teachers and administrators sometimes believe that it is more economical to learn by authority, research suggests that many things (although not all) can be learned more effectively and economically in creative ways rather than by authority (Torrance, 1977).

What Can Teachers Do?

Wise teachers can offer a curriculum with plenty of opportunities for creative behaviors. They can make assignments that call for original work, independent learning, self-initiated projects, and experimentation. Using curriculum materials that provide progressive warm-up experiences, procedures that permit one thing to lead to another, and activities that make creative thinking both legitimate and rewarding makes it easier for teachers to provide opportunities for creative learning.

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The following are some things caring adults can do to foster and nurture creativity:

- We can teach children to appreciate and be pleased with their own creative efforts.
- We can be respectful of the unusual questions children ask.
- We can be respectful of children's unusual ideas and solutions, for children will see many relationships that their parents and teachers miss.
- We can show children that their ideas have value by listening to their ideas and considering them. We can encourage children to test their ideas by using them and communicating them to others. We must give them credit for their ideas.
- We can provide opportunities and give credit for self-initiated learning. Overly detailed supervision, too much reliance on prescribed curricula, failure to appraise learning resulting from a child's own initiative, and attempts to cover too much material with no opportunity for reflection interfere seriously with such efforts.
- We can provide chances for children to learn, think, and discover without threats of immediate evaluation. Constant evaluation, especially during practice and initial learning, makes children afraid to use creative ways to learn. We must accept their honest errors as part of the creative process.
- We can establish creative relationships with children--encouraging creativity in the classroom while providing adequate guidance for the students.

What Can Parents Do?

It is natural for young children to learn creatively by dancing, singing, storytelling, playing make-believe, and so forth. One of the first challenges to creativity may be formal schooling. By this time parents, as well as teachers, appreciate conforming behaviors such as being courteous and obedient, following rules, and being like others. While these are desirable traits to some extent, they may also destroy a child's creative potential.

The following are some positive ways parents can foster and nurture the growth of creativity:

- Encourage curiosity, exploration, experimentation, fantasy, questioning, testing, and the development of creative talents.
- Provide opportunities for creative expression, creative problem-solving, and constructive response to change and stress.
- Prepare children for new experiences, and help develop creative ways of coping with them.
- Find ways of changing destructive behavior into constructive, productive behavior rather than relying on punitive methods of control.
- Find creative ways of resolving conflicts between individual family members' needs and the needs of the other family members.
- Make sure that every member of the family receives individual attention and respect and is given opportunities to make significant, creative contributions to the welfare of the family as a whole.
- Use what the school provides imaginatively, and supplement the school's efforts.
- Give the family purpose, commitment, and courage. (Torrance, 1969, p. 59)

How Adults "Kill" Creativity:

- Insisting that children do things the "right way." Teaching a child to think that there is just one right way to do things kills the urge to try new ways.
- Pressuring children to be realistic, to stop imagining. When we label a child's flights of fantasy as "silly," we bring the child down to earth with a thud, causing the inventive urge to curl up and die.
- Making comparisons with other children. This is a subtle pressure on a child to conform; yet the essence of creativity is freedom to conform or not to conform.
- Discouraging children's curiosity. One of the surest indicators of creativity is curiosity; yet we often brush questions aside because we are too busy for "silly" questions. Children's questions deserve respect.

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Resources for Parents and Teachers

There are numerous textbooks, workshops, instructional materials, videotapes, seminars, and other resources. for use in creative teaching. There are publishers, magazines, and journals that focus on creativity and creative thinking. Some of them include the following:

Publishers

Creative Learning Press, P.O. Box 320, Mansfield Center, CT 96250

D.O.K. Publishers, P.O. Box 605, East Aurora, NY 14052

Foxtail Press, P.O. Box 2996, La Habra, CA 90632-2996

Good Apple, P.O. Box 299, Carthage, IL 62321-0299

Opportunities for Learning, 2041 Nordhoff Street, Chatsworth, CA 91311

Scholastic Testing Service, Inc., 480 Meyer Road, P.O. Box 1056, Bensenville, IL 60106-8056

Teachers and Writers Collaborative, 5 Union Square West, New York, NY 10003

Trillium Press. P.O. Box 209, Monroe, NY 10950

Zephyr Press, P.O. Box 13448, Tucson, AZ 85732-3448

Journals

The Creative Child and Adult Quarterly, 8080 Springvalley Drive, Cincinnati, OH 45236

The Journal of Creative Behavior, 1050 Union Road, Buffalo, NY 14224 (Source: Torrance & Goff, 1989)

The Academic Achievement of Limited English Proficient Students

by Vickie W. Lewelling

The academic achievement of limited-English-proficient (LEP) students has long been a major national educational concern. Much debate centers around how to help students gain English proficiency while ensuring that they also make advances in their academic subjects.

LEP students often become proficient in communication skills within a short time after their arrival in the United States. As a result of their communicative competence, they are sometimes mainstreamed too quickly into the regular classroom. They then encounter difficulties understanding and completing schoolwork in the more cognitively demanding language needed for successful performance in academic subjects.

Chamot and O'Malley (1987) suggest that before LEP students are confronted with achieving in the regular classroom, they should be able to use English as a tool for learning subject matter. Basic proficiency is not adequate, since language-minority students lack exposure to, or understanding of, the vocabulary and context-specific language needed to perform the more demanding tasks required in academic courses (Short & Spanos, 1989).

Factors that Promote or Inhibit Achievement in a Second Language

Research has shown that the following factors affect achievement in a second language:

Cognitive development and first language proficiency.

The level of proficiency in the first language has a direct influence on the development of proficiency in the second language (Saville-Troike, 1984; Hakuta, 1990). The lack of continuing first language development has been found, in some cases, to inhibit the levels of second language proficiency and cognitive academic growth.

Age. Snow and Hoefnagel-Hohle (1977) suggest older students are better second language learners because they have achieved a higher level of cognitive maturity in their first language. In contrast, Long (1990) concludes that there are maturational constraints on language learning, and that rate and level of attainment are contingent upon the age at which learning begins. He suggests that a sensitive period occurs in language learning. Learning that takes place during this period is successful, and learning taking place later is limited. Collier (1989) maintains that for academic achievement, it does not matter when second language learning begins, as long as cognitive development continues at least through age 12.

Uninterrupted academic development. It is important not to limit the academic development of LEP students while they are learning English. Instruction focusing only on communication skills for 2 to 3 years will leave LEP students 2 to 3 years behind their English-speaking peers in school subjects (Collier & Thomas, 1989).

Attitude and individual differences. Oxford (1989) maintains that "language learning styles and strategies appear to be among the most important variables influencing performance in a second language." Saville-Troike (1984) found that students who had active and competitive coping styles and positive attitudes toward learning English achieved better in school.

Length of Time Needed To Achieve at Comparable Levels With Native-English-Speaking Peers

Age of arrival appears to have a great effect on the length of time it takes LEP students to begin achieving at the level of native speakers. Studying children who had received instruction exclusively in English since their arrival, Collier (1987) and Collier and Thomas (1988) found that those who were under 12 when they arrived, and who had had at least 2 years of schooling in their native country, reached the 50th percentile on standardized achievement tests in reading, language arts, science, and social studies 5 to 7 years after arrival. Students who arrived between ages 4 and 6 had received little or no schooling in their native language, had not reached the 50th percentile after 6 years, and were not expected to reach it after 7 to 10 years. Adolescent arrivals needed 7 to 10 years to achieve on par with native peers, and, if they were unable to study academic subjects while learning English, would not have enough time left in school to make up lost years of academic instruction.

Program Models That Promote Academic Achievement in a Second Language

A number of studies comparing the achievement of students schooled in English only with those who had been in bilingual education programs found that after 4 to 5 years of instruction, bilingual program students made dramatic achievement gains, while the English-only group dropped significantly below their grade level (Collier, 1989). Successful program models for promoting the academic achievement of LEP students enable these students to develop, or continue developing, academic skills while learning English.

In areas in which a significant proportion of the LEP population speaks the same native language, bilingual education programs are especially recommended (Santiago, 1989). In schools in which too few students share the same native language, a recommended option is teaching English as a second language (ESL), using "content area instruction," a technique that focuses on using a second language as the medium for instruction for mathematics, social studies, and other academic subjects (Crandall, 1987).

Several studies have documented the success of "bilingual immersion programs" (also called two-way language development, dual language, and developmental bilingual education). Bilingual immersion programs are full-time programs, for both LEP and English-speaking students, that use two languages--English and the native language of the LEP group--for instruction. In some programs, the languages are used for instruction on alternating days, or one language may be used in the morning and the other in the afternoon. Other programs divide the use of the two languages by content, with some subjects taught in English and others taught in the language of the LEP students. Because native English-speaking students and LEP students learn through both languages, they can attain proficiency in a second language while continuing to develop skills in their native language. In an evaluation of an exemplary immersion program in California, Lindholm & Fairchild (1988) found that in math, reading, and language proficiency achievement, bilingual-immersion students significantly outperformed students enrolled in nonbilingual immersion programs.

Assessment of Academic Achievement

The academic achievement of LEP students can be measured by teacher-made tests, grade point average, student performance on tests designed by a school district to measure the attainment of local school curriculum objectives, or national standardized tests (Collier, 1989). Duran (1988) and Saville-Troike (1988) point out some limitations in the testing of LEP students. Navarrete, et al. (1990) suggest using a combination of formal and informal measures to assess the academic ability of LEP students. Informal data can be used to support formal test findings or to provide documentation of student progress in instructional areas not covered by formal measures.

Conclusion

LEP students have been identified as a group at risk of academic failure. For these students to achieve their full potential, a strong commitment must be made to their educational needs and futures. As the Council of Chief State School Officers (1990) has noted, "Language minority students are a national resource to be nurtured and encouraged to attain their maximum level of achievement, just like any other children in our educational system."

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Assessing Civics Education

by Lawrence M. Rudner

Civics education provides a common cultural heritage that prepares students for their lives as American citizens (Callahan & Banaszak, 1990). Assessment can play a vital role in ensuring the success of citizenship education.

Assessing students should be an ongoing process that informs you about the progress and development of your students. Before you begin teaching, having accurate information about your students' existing citizenship knowledge, attitudes, and skills will help you design instructional activities. By giving you feedback during instruction, assessment can help your students focus their efforts. And, unit tests, which summarize how much students have learned, can help you plan subsequent lessons.

This Digest gives you guidelines for designing and planning assessment activities and describes several formats for assessment. It is designed to help you, as a classroom teacher, guide your instruction and provide accurate feedback to your students on their progress.

Basic Guidelines for Assessment

In designing assessments, you should:

1. Identify your instructional goals and communicate them to your students. Once you have identified goals and your students understand them, you can design assessments to monitor progress toward or mastery of those goals. For example, a question about how editorials are examples of a constitutional right can assess basic understanding of the Bill of Rights.

2. Integrate assessment with instruction. Assessment is simply gathering information about your students. Systematic data-gathering and recordkeeping can result in better classroom grouping, better decisions about individual students, and better pacing of instruction (Rudman, 1989).

3. Assess often using a variety of techniques. Multiple assessment approaches will help you tap the diverse knowledge, attitudes, and skills that characterize your students.

Assessment Techniques

While multiple-choice and true and false tests are commonly used in commercial testing programs, you can use a variety of other techniques to gather more meaningful and more accurate data. You may wish to consider some of the following techniques:

- **Group projects**—The California State Department of Education has reported success in using group projects To use this technique in your classroom, make students work in groups. Give each group a complex problem that requires planning, research, internal discussion, and group presentation. Be sure to develop scoring keys that define acceptable, good, and exceptional responses. This technique is particularly attractive because it facilitates cooperation and reinforces this valued outcome.

- **Interviews**—The 1969 and 1976 National Assessments of Educational Progress Citizenship Assessments used many interview questions. Interviews can assure that students understand the intent of a question. Interviews with younger students are more likely to elicit informative responses than an open-ended written questions. To prepare for interviews, identify both your questions and lists of acceptable and unacceptable responses.

- **Essay questions**—Essays are often used to assess students' ability to state and justify a position, outline viewpoints, incorporate information, and demonstrate an understanding of premises underlying our political system. A student's approach toward answering an essay question can be as revealing as the answer itself.

Writing good essay questions requires careful planning. They should be broad enough to allow students to demonstrate their knowledge. Yet, they should address an explicit set of skills and not depend strictly on students' writing ability. As with other forms of assessment, establish scoring criteria before you administer an essay test.

- **Informal Observations**—Many teachers keep records of student activities that demonstrate citizenship concepts. At the end of each day, record positive behaviors, such as reinforcing others, probing for understanding, completing

work neatly, and recognizing individual rights. These cumulative records can help you plan for parent conferences, counsel students, and make comments on report cards.

▪ **Formal Observation**—If you define behavior objectives that are action-oriented, you can use a more formal observation system to record observed behaviors and compare them with desired objectives. For example, you may specify consideration, evaluation, and respect for differing viewpoints as objectives. You can intentionally reinforce those behaviors by recording whether and how often you observe them and by providing accurate feedback to students about whether they are meeting your objectives.

▪ **Projects**—Projects are a good way to help students realize the link between classroom instruction and the real world. Our democracy provides innumerable opportunities for meaningful projects. An upcoming ballot, for example, can give you a framework for assessing whether students understand the referendum process, conduct research efficiently, formulate educated opinions, and acknowledge and understand competing viewpoints. Remember to give your students guidelines about the purpose of the project, the areas that you will assess, and the criteria for evaluation.

Summary

You can draw from a wide variety of assessment techniques to evaluate citizenship education. These techniques can help you plan instruction and can help your students and their parents evaluate their growth. To ensure that they enhance your instruction, be sure that your assessment activities are carefully planned and reflect clearly defined objectives. As with all assessment activities, be sure that you identify scoring criteria before you implement any assessment.

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Goal 4: Science and Mathematics

By the year 2000, U.S. students will be first in the world in science and mathematics achievement.

Objectives

- Mathematics and science education will be strengthened throughout the system, especially in the early grades.
- The number of teachers with a substantive background in mathematics and science will increase by 50 percent.
- The number of U.S. undergraduate and graduate students, especially women and minorities, who complete degrees in mathematics, science, and engineering will increase significantly.

ERIC Clearinghouse for Science, Mathematics, and Environmental Education

Meeting National Goals for 2000 and Beyond in Science Education

by Robert E. Yager and Patricia E. Blosser

President Bush has established a new national goal for improving science and mathematics education by the year 2000. The nation's governors first proposed such a goal, noting the poor showing by U.S. students on international comparisons (Lapointe, Mead & Phillips, 1989). The President and the governors have proposed three objectives for meeting the broad goal:

- Strengthening science and mathematics throughout the system, with special emphasis on the early grades.
- Increasing the number of teachers with substantive backgrounds in mathematics and science.
- Increasing the number of college/university graduates in science, mathematics, and engineering, especially women and minorities.

The goal and objectives provide needed support and direction for educational reform in science education.

Strengthening Science Programs

The National Science Foundation (NSF) has been involved in supporting science curriculum development, funding a variety of projects through its Division of Materials Development, Research, and Informal Science Education Section. Current projects involve scientists and science educators, schools, and publishers. Projects have been developed for elementary and for middle school science which reflect advances in technology and involve the use of interactive videodiscs, computers, and national computer networks. These projects also reflect an increased understanding of how students learn by building or constructing their own knowledge based on observations and experiences.

Two of the largest reform efforts for K-12 programs are Project 2061 (AAAS, 1988) and the National Science Teachers Association (NSTA) Scope, Sequence, and Coordination Project (SS&C), which currently involves grades 6-12 only (Aldridge, 1989). Project 2061 reflects the philosophy that science is for ALL Americans, not just for those who may choose science or science-related careers. NSTA's Scope, Sequence, and Coordination Project also has as its goal making science accessible to all students. The SS&C Project proposes to abandon the conventional sequence of separate courses, a different science each year, in favor of spreading these subjects over four or six years of a student's secondary education, with each of the sciences being taught each year in some appropriate fashion for the student's level of cognitive development.

Strengthening Teachers' Knowledge

The reform of teacher education, while necessary, is a complex task. Teacher education programs are influenced by guidelines of state departments of education, accrediting agencies, and professional associations and societies, as well as by an institution's view of what constitutes general education for its students. The Holmes Group calls for teacher education leading to certification to occur at the graduate level. Holmes Group publications also call for a reform in general education courses and instruction within colleges and universities, as well as for the creation of professional development schools in which field experiences would take place (1986, 1990). Project 30 (1989) involves alternative activities for teacher education reform. The National Board for Professional Teaching Standards (1989) has been created and is working toward national certification for teachers.

Inservice teacher education has not been forgotten either. The National Science Foundation supports a wide variety of teacher enhancement projects, many of which are headed by science faculty members of universities. The United States Department of Education sponsors the Eisenhower State Mathematics and Science Education Program. Now five years old, the Eisenhower Program provides state leadership activities, flow-through funds to districts, and higher education grants. It is promoting a kind of "vertical integration" of various elements of the educational system, so that they are aiming at common goals. Each component of the program primarily supports professional development activities for teachers.

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Working With Underrepresented Populations

A critical problem in science education is the student drop-out rate from science all the way through the K-16 program (Shakhashiri, 1990). Another critical, and related, problem is the downward trend in enrollment of females and minorities in mathematics and physical science, accompanied by decreases in achievement and interest, as science courses become optional in secondary schools.

While there is much we do not understand about the low participation rates of women, minorities, and disabled persons in science-related careers, what we do know suggests that there are alterable features of schools that appear to constrain participation. Three factors appear to govern attainment in scientific fields: (1) opportunity to learn science (and mathematics); (2) achievement in science (and mathematics); and (3) students' decisions to pursue science- (or mathematics-) related careers. Unfortunately, there is little theoretical research on how these factors work together or the relative contribution of each factor to participation (Oakes, 1990a).

Researchers have found that while women and minorities drop out of the science pipeline at various stages, women tend to leave primarily during senior high school and college, while blacks and Hispanics leave much earlier. Women leave because they CHOOSE not to pursue scientific careers, while blacks and Hispanics leave primarily due to low achievement in mathematics during precollege years. If this situation is to be changed, educators must intervene at those points in the pipeline where students drop out, and interventions must be appropriate to each group. Available research suggests that altering the way science (and mathematics) is taught can increase females' achievement and their likelihood of choosing to study these subjects. Minority achievement can also be increased by providing additional, positive science (and mathematics) experiences both in and out of school, as well as providing altered instruction, career information, and contact with role models (Oakes, 1990a).

Meeting the National Goal for Science Education

To achieve the national goal for science and mathematics by the year 2000, many practices need to change. Research data provide evidence that low-income, minority, and inner-city students have fewer opportunities to learn science and mathematics. They have considerably less access to science and mathematics knowledge at school, fewer material resources, less-engaging learning activities in classrooms, and less-qualified teachers. Such findings likely reflect general patterns of educational inequality that are not likely to be self-correcting or easily changed. Reform measures might therefore involve a multiple-strategies approach of calling attention to the problem, generating additional resources, distributing resources and opportunity more equitably, and holding states, districts, and schools accountable for equalizing opportunity (Oakes, 1990b).

Findings of the National Center for Improving Science Education (Loucks-Horsley et al., 1990) support a thirteen- point pathway for meeting the national goals for science education: (1) make science basic; (2) build curricula that nurture conceptual understanding; (3) connect science to technology; (4) include scientific attitudes and skills as important goals; (5) view science learning from a constructivist perspective; (6) use a constructivist-oriented instructional model to guide learning; (7) assess what is valued; (8) connect curriculum, instruction, and assessment; (9) use a variety of assessment strategies; (10) assess programs as well as students; (11) view teacher development as a continuous process; (12) choose effective approaches to staff development; and (13) provide teachers with adequate support to implement good science programs.

Recognizing our dilemma, President Bush has provided this nation with direction by establishing a national goal related to science preparedness. His priority is to "make American students first in the world in math and science achievement by the year 2000." There is much to suggest that we are underway. However, we have no time to waste as we learn from the many projects designed to strengthen programs, improve teachers, and increase the numbers in the pipeline, especially those in underrepresented groups.

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Meeting National Goals for 2000 and Beyond in Mathematics Education

by James Hassell and Joan Armistead

The reform of American elementary and secondary school mathematics education, launched in the 1980s, has received renewed attention because of the Mathematical Sciences Board's (MSEB) *Everybody Counts* (1989) and the Education Summit sponsored by the nation's governors and President Bush. The Summit's fourth national goal for education states, "By the year 2000, U.S. students will be first in the world in mathematics and science achievement." To meet this goal, three specific objectives have been announced:

- Math and science education will be strengthened throughout the system, including special emphasis in the early grades.
- The number of teachers with a substantive background in mathematics and science will increase by 50 percent.
- The number of U.S. graduate and undergraduate students, especially women and minorities, who complete degrees in mathematics, science, and engineering will increase.

If the nation is to achieve this fourth goal, Linda Darling-Hammond (1990) identifies three areas needing change:

- Curriculum and testing
- Teachers and teaching
- School restructuring

Some local, state, and national initiatives are focusing on these three areas through the development of guidelines, models, and processes for the needed reforms.

Curriculum and Testing

The National Council of Teachers of Mathematics (NCTM) has provided a framework for the needed curricular changes with its widely accepted document, *Curriculum and Evaluation Standards for School Mathematics* (1989). Many recent local and state curriculum revisions are being patterned after this set of standards. Examples are the Ohio Department of Education's Model Competency-Based Mathematics Program (1990) and the California State Board of Education's Field Review Draft of the California Mathematics Framework (1990), both of which rely heavily on the National Council of Teachers of Mathematics document for their direction.

Parallel changes in the testing industry are supporting some of the curricular restructuring. The *College Board News* (1990:1) reports that the Scholastic Aptitude Test (SAT) is moving to a format to "include more data interpretation and applied mathematics questions, geared to problem solving."

Teachers and Teaching

John Goodlad's book, *Teachers for Our Nation's Schools* (1990); The Holmes Group's *Tomorrow's Schools: Principles for the Design of Professional Development Schools* (1990); and the Mathematical Association of America's (MAA) *Call for Change: Recommendations for the Mathematical Preparation of Teachers of Mathematics* (1991) all outline strong programs for needed changes in teacher preparation.

Not all the emphasis is on preservice teachers. The establishment of a mathematics working group within the National Board for Professional Teaching Standards and the release of NCTM's "Professional Standards for Mathematics Teachers" (1991) together focus national attention on, and give direction to, upgrading the nation's mathematics teacher corps. A large percentage of the funds available to state agencies for mathematics and science development are available from one of the ongoing U.S. Department of Education programs, the Eisenhower program, to support inservice programs and other professional development activities for strengthening K-12 mathematics teaching in every state and district.

School Restructuring

Organizational school restructuring is being supported on many fronts. Some of the most comprehensive programs are being developed by Theodore Sizer's Coalition of Essential Schools; the University of Wisconsin's National Center for Research in Mathematical Sciences Education;

and Michigan State University's Center for the Learning and Teaching of Elementary Subjects. These efforts will be advanced by the National Science Foundation's (NSF) $31 million Statewide Systemic Initiatives (Committee on Education and Human Resources, 1991).

The business community is also helping to drive the restructuring movement by forming educational partnerships. For example, Exxon's Education Foundation is supporting multisite professional development models for K-3 mathematics specialists. This project specifically focuses on the Summit's objective to improve mathematics instruction in the early grades.

Minorities—Tracking

Two closely related concerns permeate all three of the areas that Darling- Hammond has identified as needing change. The first is the role that tracking plays in limiting the number of minorities involved in mathematics, and the second is how to increase their number (Oakes et al., 1990). Numerous multilevel efforts have been initiated to address these problems; these include:

- MAA's Strengthening Underrepresented Minority Mathematics Achievement (SUMMA) project to attract minorities to teaching.
- MSEB's *Making Mathematics Work for Minorities Framework for a National Action Plan*: 1990-2000.
- Council of the Great City Schools' National Urban Education Goals.
- NCTM'S Algebra for Everyone project.
- NSF's Alliances for Minority Participation (AMP) program.
- University of Pittsburgh and Ford Foundation's cooperative endeavor, Quantitative Understanding: Amplifying Student Achievement and Reasoning (QUASAR).

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Computer Uses in Secondary Science Education

by Ronald H. Morse

Computer use by teachers is a function of their computer experience and expertise, hardware and software availability, and perceived need. An excellent science course may be taught without a computer. However, the careful incorporation of computers into a science course can add an important level of enhancement. Although not conclusive, studies do indicate that computer use in science education can improve learning and positively influence students' attitudes and self-esteem.

Computer use also adds another dimension to the teacher's repertoire of strategies, which may improve overall learning. In addition, most (if not all) students, especially those planning a career in science, will be required to be computer literate.

What Research Finds

The following studies found positive effects associated with microcomputer use in science education applications:

- Higher achievement and more positive attitudes were observed in a high school biology course that was "computer-loaded" (Hounshell & Hill, 1989).
- Scientific reasoning skills were enhanced in students using a microcomputer-based curriculum (Friedler, Nachmias, & Songer, 1989).
- Specialized computer programs developed inquiry skills while increasing scientific knowledge, even when strong "misconceptions" were present (Shute & Bonar, 1986).

More than one study found that computer use by students enhanced self-esteem (Robertson, Ladewig, Strickland, & Boschung, 1987). This may also account for the increased interest in science by lower achieving students who have computers incorporated into their curriculum.

Some studies, however, find computer-assisted instruction (CAI) to be of limited value in science applications, especially when the control group is given equivalent non-computer support. For example, a study by Wainwright (1989) showed that a control group using worksheets scored significantly higher than did an experimental group using CAI. Wainwright suggests paper-and-pencil worksheets allowed the students to experiment more easily with trial and error in balancing chemical equations.

A major problem in evaluating the results of studies designed to measure the value of CAI is the quality of the software used in the study. Not only should the software be well-designed, there must be a match among the objectives of the software (or courseware), the understanding of the teacher as to how to apply it, and the needs or interests of the students.

How Science Teachers Are Using Computers

Most teachers are willing to incorporate computers into their curricula when the obstacles are not overwhelming. The desired uses include more than CAI. In fact, only a relatively small number of science teachers are able to use computers for CAI and lab applications because there isn't enough hardware and because lab applications require specialized hardware and software. A study of secondary science teacher needs (Baird & Rowsey, 1989) revealed, of the nearly 800 respondents, 70 percent wished to know more about using computers for science instruction, 64 percent to manage instruction, and 60 percent to use a test item data bank.

The most widely used application appears to be word processing. Test and worksheet production takes the lead in this area, and customized laboratory activities are produced as well. Many science teachers employ spreadsheet or customized or commercial grade book programs to record, calculate, and post student grades. Using test item banks to sort and select questions is becoming more popular as software and banks become more available. Finally, a small number of teachers are using computers to produce items such as crossword puzzles, word searches, posters, signs, and diagrams to support instructional activities.

A small but increasing number of science teachers are using computers as a component in selected laboratory activities. Microcomputer-based laboratories (MBLs) employ computers interfaced with commercial or "home-built" transducers. With the appropriate software, the computers measure, record, graph, and analyze a variety of physical quantities, including: temperature, light, pH, pressure, and electrical and magnetic parameters. Some

teachers create their own programs, in a computer language such as BASIC, that allow both students and teachers to evaluate the accuracy of laboratory data and/or calculations.

On the cutting edge of classroom computer applications, interactive videodiscs are appearing in many science classrooms. To date, the most popular subject areas have been biology and earth science, and programs with related courseware have recently been produced for physics and chemistry. A Texas physical science curriculum project purports to have had significant success with such a program and states even though the effects of using this curriculum varied by teacher and other factors, the overall results were positive, with the greatest achievement gains being for "low-ability" students (Savenye & Strand, 1989).

Finally, students are increasingly introduced to computer database searching at school. Many high schools subscribe to databases on CD-ROM (compact disc, read-only memory). In addition, modems are used to access university and government databases at remote locations. Such databases range from libraries' online catalogs to scientific data gathered from spacecraft and satellites.

Constraints to Classroom Computer Use

By far the major factor inhibiting computer use in the classroom is the insufficient amount of computer hardware and software available due to budgetary constraints. It often takes a science department 3 to 6 years to obtain the minimum number of computers necessary for one teacher to effectively incorporate CAI and MBLs into the curriculum. Although just one or two computers can be incorporated into classroom activities, this number will support a very limited number of strategies. Moving computers in and out of a classroom is time consuming and significantly inhibits their use. Moving students to a "computer lab" also has several constraints, because the typical computer lab is too small and that teachers must compete for limited lab time.

The Ideal Computer Environment

An ideal computer learning environment, might be an arrangement in which each student has access to a "friendly" computer station consisting of high-quality computer-managed instruction (CMI), touch screen color displays, and interactive video. Students could proceed at their own rate. Motivated students of the highest ability might learn at three to four times the average classroom rate, completing two or three high school science courses a year. Students who seem to learn more slowly could be given extra months to complete a course without failure.

An important feature of CMI would be a learner's ability to choose whether to proceed or to review when attempting to master course objectives. Research has shown that learning increases when the learner has some control over the CAI program (Kinzie, Sullivan & Berdel, 1988). In addition, students would be encouraged to repeat for themselves demonstrations observed on the interactive videodisc. And, regardless of the degree of computer involvement, there would also be a substantial hands-on laboratory component integrated into each science course.

Students in the ideal computer environment would also be encouraged (or required) to participate in cooperative activities, perhaps in the form of problem-solving activities that would not require that all students in a group be at the same level of instruction. Indeed, it might be very beneficial to create cooperative problem-solving groups composed of students currently studying topics in different areas (i.e., earth science, biology, chemistry, and physics), or at differing levels of an integrated science curriculum.

The role of the teacher in a room of 24 such individual stations would be to discuss questions and concerns brought to him or her by the students, as well as to coordinate and oversee laboratory activities. The teacher's job might become even more rewarding as ideal learning conditions replace the disadvantages of group instruction and more time becomes available for meaningful student contact (Robertson, Ladewig, Strickland, & Boschung, 1987).

Conclusion

Computer use in the classroom is still in its infancy. Its overall effectiveness needs to be enhanced by better hardware and software as well as greatly increased availability of each. More research is needed to discover the most effective strategies for their use. The rate at which computers will be used to enhance education, in science and in other fields, depends mainly upon state and national monetary commitment, followed by the willingness of individual schools to provide good inservice programs.

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Selected Procedures for Improving the Science Curriculum

by Patricia E. Blosser and Stanley L. Helgeson

This Digest has been prepared to provide some information about activities aimed at improving the science curriculum, a task that is neither easy nor simple.

What Are Some Current Science Curriculum Emphases? Currently there are several identifiable emphases within science curriculum materials. Inquiry teaching, advocated as part of the science curriculum reform movement after Sputnik, is still in use. The rationale for this emphasis is that students will develop better understandings of the nature of science and will be more interested in science if they actively "do" it. Student investigations are the backbone of the inquiry curriculum, and the focus is on developing science inquiry and process skills. Science content and science thinking skills are both important, interrelated parts of science, with content knowledge acquisition secondary to the development of thinking skills. The assumption is that conceptual understanding is a product of scientific thinking processes.

A second emphasis is that of science, technology, and society. In this emphasis, the purpose of school science is not to create future scientists, but to create citizens who understand science in ways that will enable them to participate intelligently in critical thinking, problem solving, and decision making about how science and technology are used to change society. The curriculum focuses on humans and society and is problem-centered and responsive to local issues. Problems to be investigated are selected for their relevance to students' lives and are multidisciplinary. Because the focus is on skill development in problem solving and decision making, process goals are emphasized over content goals. The role of the science teacher is a complex one—helping students see how science and technology can both cause problems and help solve them.

A third emphasis is that of conceptual change. The rationale for this emphasis is that scientific knowledge is meaningful to learners only when it is useful in making sense of the world. The primary goal is to help students develop meaningful conceptual understandings of science and its ways of describing, predicting, explaining, and controlling natural phenomena. All students are expected to develop scientific literacy. The science curriculum is focused on investigations and activities designed to help students change their intuitive, everyday ways of explaining the world around them—to incorporate scientific concepts and ways of thinking into their personal frameworks. The science processes are used within a conceptual framework, and the focus is on the power of conceptual understanding. Content is important as it contributes to conceptual understanding. However, the emphasis is on the acquisition of understanding, not on rote memorization or terminology. The conceptual change emphasis has its basis in knowledge resulting from research on how children learn (Roth, 1989).

A fourth emphasis that is still developing is thematic science teaching. The concepts that compose the science curriculum are built upon a structure of major ideas that connect the science disciplines. This is illustrated in *Project 2061: Science for All Americans* sponsored by the American Association for the Advancement of Science (AAAS, 1989). Project 2061 is aimed at identifying, developing curriculum models for, and implementing the understandings and habits of mind essential for all citizens in a scientifically literate society. (This project is discussed in more detail in Science Education Digest #3, 1990.) Six themes pervade science, mathematics, and technology and unify the various disciplines: systems, models, stability, patterns of change, evolution, and scale.

This thematic approach may be used to provide the unifying strands for the science curriculum to be taught as part of the National Science Teachers Association's (NSTA) project on Scope, Sequence, and Coordination of the Science Curriculum. (See Science Digest #3, 1990.) The NSTA project proposes a major change in the structure of the science curriculum. As with Project 2061, the aim of the NSTA project is to educate all students, not just the science-prone. The Scope, Sequence, and Coordination project advocates eliminating the current single-year courses in secondary school science and having students study all sciences, taught in some developmentally appropriate fashion, every year in grades 7-12 or 9-12. The Scope, Sequence, and Coordination project of

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NSTA (Aldridge, 1989) is considered as a fifth emphasis.

A sixth emphasis is that of interactive science learning. Rather than using competition in the science classroom, students are encouraged to converse and collaborate about an idea or event. The use of cooperative learning is particularly evident in several of the elementary school science projects discussed in Science Digest #3, 1990. In some projects, such as the National Geographic Society's Kids Network, grade 4-6 students are involved nationwide in collecting, analyzing, and sharing scientific data through extensive use of telecommunications.

However, the science curriculum does not exist in isolation. It is implemented by teachers who are influenced by the students with whom they work as well as by the materials and facilities with which they work.

How Do Other Related Factors Influence the Science Curriculum?

Teacher Preparation. It does not matter how well-designed a science curriculum is if the teacher assigned to teach it is not prepared for the job. A widely held assumption is that teachers with a lot of subject matter background will do a more effective job than those with less. However, research has not yet documented a strong relationship between teachers' course-taking in science and student achievement (Weiss, 1988). Certification requirements vary among the states: 42 states offer a broad-field science certification, with requirements ranging from 18 to 60 credit hours of science. Many science teacher education programs prepare teachers to teach a particular science. However, many schools do not have sufficient enrollment to enable a science teacher to teach only one discipline. Data from a study conducted by NSTA revealed that most science teachers are assigned to teach courses in at least two, and often three or more, sciences (Weiss, 1988).

When teachers teach a subject not listed on their certificate, they are teaching out of field. In physics, for example, 25 of 27 states surveyed have more high schools than teachers assigned to physics, and 12 states have fewer than two-thirds of the high schools with a teacher assigned to physics (Blank, 1990). Such data certainly have implications for improving the science curriculum.

Teacher supply and demand are also related to teacher preparation. Although some science education reports predict a severe shortage of science teachers, data from a national survey by Weiss (1988) do not support this. According to the survey, the average age of science teachers is about 40, with about 17 percent age 30 and younger and 15 percent age 50 and older. However, Weiss (1987) also found that sizable proportions of science teachers had not taken a course for college credit in their subject in the last 10 years. Blank (1990) reports that the majority of new hires in teaching come from a reserve pool composed of teachers who left teaching and then decided to return as openings increased. It would appear that in-service is needed to help science teachers keep up-to-date with developments in the sciences.

Textbooks. Teachers often rely on revised editions of science textbooks to identify changes in the content they are teaching. Data from the 1985-86 National Survey of Science and Mathematics Education (Weiss, 1987) show that for grades 4 and up, roughly 90 percent of the science classes at each grade level use published textbooks/programs. Two publishers—Merrill and Holt and Rinehart and Winston—account for more than half the textbooks used in secondary science. A sizable proportion of science teachers use textbooks that are six years old.

Textbooks have been criticized by many science educators as being too encyclopedic, of perpetuating misconceptions, and of not reflecting current knowledge both about science and about how children learn. The one middle school and seven elementary school "triad" partnerships made up of publishers, scientists and science educators (Science Digest #3, 1990), reflect current knowledge about how children learn and construct their own knowledge, about the benefits of using science activities that foster cooperative learning, as well as integrating science with other subjects.

What Remains to be Done?

To improve the science curriculum, we need to change some of our traditional practices. We need to become more focused on helping students think scientifically rather than memorize facts. We need to take into account the way different ethnic and minority groups learn science. We need to become more sensitive to gender issues so that females are encouraged to continue to study science. We need interventions to encourage women and minorities to choose the proper math courses so they are able to continue to study science in high school and college, and succeed. We need to make different curricular and instructional decisions so that we can have a science curriculum that is for all students.

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Students at Risk in Mathematics: Implications for Elementary Schools

by Margaret Kasten and Robert W. Howe

Two groups of students are learning substantially less mathematics than they should. They are entering the workforce unable to use mathematics effectively, and probably account for a significant amount of the reason national assessment scores in mathematics do not show much improvement.

The first group consists of the "typical" or "usual" potential school dropout and underachiever. The second group, termed "nominal mathematics students," stays in high school and may even go on to college, but their mathematics education is not adequate to allow them maximum educational and life choices. Both the potential dropout and the nominal mathematics student are at risk of not developing adequate mathematical knowledge and skills and contributing less than what they might to their own lives and to society.

What can the elementary school staff do to address the problems of these at-risk students?

Who Are the Potential Dropouts?

Data have been accumulated and analyzed on the numbers and characteristics of potential dropouts. Recent data indicate over 20 percent of the students who enroll in American schools become part of this group. In many urban and rural areas the percentage of students who drop out is much higher. It is estimated that two-thirds of these students are from families at the poverty level. They frequently differ from their more successful peers in development of self- esteem, task performance, school achievement, and career and cultural aspirations. They often develop behavior patterns that create problems in school.

Analyses of National Assessment of Educational Progress (NAEP) data and achievement test scores from states indicate that from 20 to 25 percent of the school population completing high school do not perform at a satisfactory level on many basic test questions. Correlations from research studies indicate most of these students complete only the basic required mathematics courses. They usually have taken no mathematics elective courses.

Unlike the potential dropout, "nominal mathematics students" seldom cause mathematics teachers major difficulties in school. They do not manifest behavior problems and they are not viewed as potential problems for society. These students are at risk because their level of understanding and competence in mathematics is substantially below desired levels. These students are not likely to continue in mathematics beyond basic requirements in high school or consider a career that uses mathematics. Many of these students also will not be able to use mathematics when needed in their daily lives.

What Are Some of the Causes of At-Risk Students in Mathematics?

There are several variables that tend to cause students to fall into the at-risk groups in mathematics. Several of these causes can be prevented, reduced, or modified to help make students more successful in school and in mathematics in particular.

Some students, especially minority students, are not able to see themselves and their backgrounds reflected in the curricula. The curriculum in many cases does not provide for cultural differences.

Females have tended to be especially at risk in many mathematics courses or classrooms because mathematics has frequently been viewed as a male domain. Instructional materials, family and peer behaviors and expectations, and teacher behaviors and expectations have frequently reinforced this attitude.

Some students develop anxieties that interfere with studying, learning, and using mathematics. These anxieties can interfere with learning and performance and cause the student to underperform and/or to elect to avoid mathematics courses and experiences.

Some students have not succeeded in mathematics classes due to learning and behavior problems, sensory handicaps, and physical and health impairments. These conditions do not need to limit the mathematical learning of these students. In many cases, mathematically related careers can provide these students with excellent employment opportunities.

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Some students less likely to complete school mathematics programs successfully and acquire the skills necessary for higher education and employment because they are enrolled in classes where the curriculum and instruction are not appropriate to foster desired attitudes, aspirations, skills, and understandings related to mathematics. For many students the curriculum is neither interesting nor relevant; its very structure serves to "turn off" students. The mathematics curriculum often lacks real-world problems and applications, is repetitious, and focuses too much on product and not on process.

Mathematics instruction also frequently suffers from other problems. The usual classroom routine is not effective for developing new concepts, for example, and the pace is wrong for many students. Drill and practice can be ineffective; diagnosis and treatment of error are often superficial; and instruction does not provide sufficient hands-on experiences.

What Can An Elementary School Staff Do To Help Reduce the Number of Mathematically At-Risk Pupils?

Data indicate a strong relationship exists between early mathematics achievement and later mathematics achievement. Mathematics competency appears to be learned. Mathematics programs that are planned and operated to attempt to ensure success tend to have fewer remedial pupils and fewer nominal mathematics pupils. Prevention is far more successful than remediation; early remediation is more successful than late remediation.

While more research is needed to develop better models, combinations of the following variables are associated with school programs that tend to have a lower percentage of dropouts and a lower percentage of nominal mathematics students.

The successful elementary school mathematics program:

- stresses goals and objectives;
- stresses building knowledge and developing and using skills in a coordinated curriculum;
- provides mathematics instruction early (kindergarten and grade 1) and continues;
- provides time for mathematics instruction on a regular basis;
- stresses real-life use of mathematics;
- uses activity-based learning;
- uses a variety of instructional approaches to accommodate learning styles, preferences, and needs;
- provides enrichment and adequate resources for all classes;
- provides for transition from grade to grade;
- emphasizes a continuous progress approach and/or cooperative learning techniques;
- stresses effective use of homework;
- has a program for involving parents;
- uses a diagnostic and prescriptive approach in instruction to help identify pupil errors and to keep them from falling behind grade level expectations;
- has an early identification and intervention program for pupils with learning problems;
- uses frequent monitoring to identify pupils with possible problems;
- maintains careful records of pupil progress;
- frequently uses a special program (in class or pull-out) and special assistance (tutoring)to help pupils who have had difficulty in mathematics; and
- provides intensive individual attention to individuals with sustained problems for a period of time.

Research and development on programs for elementary school mathematics continues. There are, however, several programs available through the National Diffusion Network (NDN) and also listed in the ERIC database.

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Curriculum and Evaluation Standards for Mathematics Education

by Marilyn N. Suydam

In 1989, the National Council of Teachers of Mathematics (NCTM) released a document of major importance for improving the quality of mathematics education in grades K–12. This document, *Curriculum and Evaluation Standards for School Mathematics*, contains a set of standards for judging mathematics curricula and for evaluating the quality of the curriculum and student achievement. It represents the consensus of NCTM's members about the fundamental content that should be included in the school mathematics curriculum, establishing a framework to guide reform in school mathematics. Inherent in the *Standards* is the belief that all students need to learn more, and often different, mathematics.

What is the Rationale for the *Standards*?

Technology is changing the workplace, the home, and daily life. Moreover, the mathematics a person needs to know has shifted, and new mathematics is being created as technological applications emerge. Yet the teaching of mathematics has remained relatively unchanged. As it has for centuries, mathematics often relies on rote memorization.

The objectives of mathematics education must be transformed to meet the critical needs of our society: an informed electorate, mathematically literate workers, opportunity for all students, and problem-solving skills that serve lifelong learning. Both the content that is being taught and the way it is taught need to be reconsidered and, in many cases, transformed. To ensure quality, to indicate goals, and to promote change are the three reasons why NCTM issued the *Standards*.

What are the Underlying Assumptions of the *Standards*?

Several assumptions shape the vision of mathematics set forth in the *Standards*: (1) Mathematical power can and must be at the command of all students in a technological society. (2) Mathematics is something one does—solve problems, communicate, reason; it is not a spectator sport. (3) The learning of mathematics is an active process, with students constructing knowledge derived from meaningful experiences and real problems. (4) A curriculum for all includes a broad range of content, a variety of contexts, and deliberate connections. (5) Evaluation is a way to improve instruction and the whole mathematics program.

What Goals Are Established for Students?

All students should have opportunities to learn a broad spectrum of mathematics. Toward that end, the *Standards* state five goals for students: to learn to value mathematics, to learn to reason mathematically, to learn to communicate mathematically, to become confident of their mathematical abilities, and to become mathematical problem solvers.

What is the Framework for School Mathematics?

The *Standards* offer a framework for curriculum development—a logical network of relationships among identified topics of study. Although they specify the key elements of a high-quality school mathematics program, they neither list topics for particular grades nor show a "scope and sequence" chart. Instead, the 40 curriculum standards discuss content at three grade-level groups: K–4, 5–8, and 9–12. The 14 evaluation standards offer strategies to assess the curriculum, instruction, and program.

The first three curriculum standards for each grade level and three of the evaluation standards deal with problem solving, communication, and reasoning. A fourth curriculum standard, Mathematical Connections, is predicated on the belief that mathematics must be approached as a unified whole. Consequently, curricula should deliberately include instructional activities to reveal the connections among ideas and procedures in mathematics and applications in other subject matter areas.

For each grade-level group, nine or ten content standards supplement the first four curriculum standards. While the titles are sometimes similar, the concepts and processes vary by level. In a lengthy presentation for each standard, the mathematical outcomes for students, the focus of the standard, discussion of what the standard means, and examples of how the content might be taught are provided.

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What Standards Are Included for Each Grade Cluster?

The 13 standards for K–4 are: Mathematics as Problem Solving, as Communication, and as Reasoning, and Mathematical Connections; Estimation; Number Sense and Numeration; Concepts of Whole Number Operations; Whole Number Computation; Geometry and Spatial Sense; Measurement; Statistics and Probability; Fractions and Decimals; and Patterns and Relationships.

There are 13 standards for grades 5–8: Mathematics as Problem Solving, as Communication, and as Reasoning, and Mathematical Connections; Number and Number Relationships: Number Systems and Number Theory: Computation and Estimation; Patterns and Functions; Algebra; Statistics; Probability; Geometry; and Measurement.

Fourteen standards pertain to grades 9–12: Mathematics as Problem Solving, as Communication, and as Reasoning, and Mathematical Connections; Algebra; Functions; Geometry from a Synthetic Perspective; Geometry from an Algebraic Perspective; Trigonometry; Statistics; Probability; Discrete Mathematics; Conceptual Underpinnings of Calculus; and Mathematical Structure.

What Standards Are Included For Evaluation?

Three standards pertain to general assessment: Alignment, Multiple Sources of Information, and Appropriate Assessment Methods and Uses. Seven standards concern student assessment: Mathematical Power, Problem Solving, Communication, Reasoning, Mathematical Concepts, Mathematical Procedures, and Mathematical Disposition. Finally, four standards are on program evaluation: Indicators for Program Evaluation, Curriculum and Instructional Resources, Instruction, and Evaluation Team.

What Are Some Suggested Changes That Should Be Included in Mathematic Instruction?

Some aspects of doing mathematics have changed in the last decade, in large part because of technology. Changes in technology and the broadening of the areas in which mathematics is applied have resulted in growth and changes in mathematics itself. Technology makes it imperative that: (1) appropriate calculators should be available to all students at all times; (2) a computer should be available in every classroom for demonstration purposes; (3) every student should have access to a computer for individual and group work; and (4) all students should learn to use the computer as a tool for processing information and performing calculations to investigate and solve problems.

The availability of calculators does not eliminate the need for students to learn algorithms; some proficiency with paper-and-pencil computational algorithms is important. Contrary to the fears of many, there is no evidence to suggest that the availability of calculators makes students dependent on them for simple calculations. Students should be able to decide when they need to calculate and whether they require an exact or approximate answer. They should be able to select and use the most appropriate tool.

A constructive, active view of the learning process must be reflected in the way much of mathematics is taught. Thus, instruction should vary and include opportunities for: appropriate project work; both group and individual assignments; discussion between teacher and students and among students; practice on mathematical methods; and exposition by the teacher.

The *Standards* were developed with consideration to the content appropriate for all students. This does not suggest that all students are alike; it does suggest that all students should have an opportunity to learn the important ideas of mathematics.

What Are Some Next Steps for Teachers and Administrators?

The NCTM challenges all to work toward the goal of improving the school mathematics program as identified by the *Standards*. Teachers and administrators may obtain the materials listed in the reference section to learn more about the *Standards*. The school staff should review the current program and instruction to identify desirable changes and begin to modify the experiences provided for pupils.

Several states and many school districts have started to modify programs. Materials describing these activities will be published in journals of the NCTM (*The Arithmetic Teacher and The Mathematics Teacher*) on a regular basis. Schools desiring more information or assistance should contact their state department of education mathematics education coordinator/specialist, and periodically check *Resources in Education* and the *Current Index to Journals in Education* for information and materials.

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Goal 5: Adult Literacy and Lifelong Learning

By the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

Objectives

- Every major American business will be involved in strengthening the connection between education and work.

- All workers will have the opportunity to acquire the knowledge and skills, from basic to highly technical, needed to adapt to emerging new technologies, work methods, and markets through public and private educational, vocational, technical, workplace, or other programs.

- The number of high-quality programs, including those at libraries, that are designed to serve more effectively the needs of the growing number of part-time and mid-career students will increase substantially.

- The proportion of those qualified students (especially minorities) who enter college, who complete at least two years, and who complete their degree programs will increase substantially.

- The proportion of college graduates who demonstrate an advanced ability to think critically, communicate effectively, and solve problems will increase substantially.

School to Work Transition: Its Role in Achieving Universal Literacy

by Susan Imel

The fifth educational goal established at the Education Summit is achieving universal literacy in the United States. The goal states that "by the year 2000, every adult American will be literate and will possess the skills necessary to compete in a global economy and to exercise the rights and responsibilities of citizenship." In a recent article in the *Kappan*, Larry Mikulecky (1990) outlines why "achieving universal literacy within the decade . . . is probably not possible, even with infinite resources" (p. 306). Nevertheless, Mikulecky is optimistic that progress can be made toward universal literacy.

To reach the goal of universal literacy in the United States, five objectives were established. This digest focuses on the first objective, that every major American business will be involved in strengthening the connection between education and work. The issues involved include the need for effective school-to-work transition and its relationship to the goal; the current status of business involvement in this transition, and steps for developing effective connections between education and work.

Why School-to-Work Transition?

Although the goal of universal literacy in the United States refers specifically to the literacy of adult Americans, significant progress toward the goal is dependent to a great extent upon individuals' educational experiences prior to adulthood. Encouraging business involvement in strengthening the connection between school and work acknowledges the relationship between a literate adult population and its prior educational experiences.

Because early educational reform efforts focused on college-bound youth, little attention was given to the need for improving school-to-work transitions of noncollege-bound youth. However, recent reports such as *The Forgotten Half* (William T. Grant Foundation, 1988) and *America's Choice* (National Center on Education and the Economy, 1990) stress the need to "overcome the disconnection between education and work" (National Governors' Association, 1990, preface). This renewed emphasis on the school-to-work transition has been prompted by such factors as changing demographics, the need for a more productive and competitive work force, and concern about the economic well-being of many youth.

According to the National Governors' Association (1990, p. 22), "in the past it was possible to tolerate . . . a haphazard approach to school-to-work transition . . . . [b]ut today the waste in human potential that results no longer can be afforded." Programs that connect students with the business world are needed to give young people both knowledge of work and of themselves (William T. Grant Foundation, 1988).

What Is the Current Status of Business Involvement?

During the past decade business involvement with schools has increased, and, as a result, progress has been made toward strengthening the connection between education and work (Mikulecky, 1990). Results of a *Fortune* magazine survey support this statement. Of the 305 *Fortune* 500 and Service 500 companies responding to the survey, all but seven (2 percent) reported they were doing something for education (Kuhn, 1990). Companies responding affirmatively to the survey were involved in the following activities to help public education: contributing money, 78 percent; offering students summer or part-time jobs, 76 percent; contributing materials or equipment, 64 percent; encouraging employees to run for school boards, 59 percent; participating in school partnerships, 48 percent; offering teachers summer jobs, 26 percent; lobbying legislatures for reform, 22 percent; supporting tax increases or bond issues, 18 percent; and loaning executives to schools, 12 percent (ibid.).

Although it is true that more businesses are helping public education, many of the activities listed here do not contribute directly to strengthening the linkages between education and work. In some communities, however, business leaders are entering into a new form of collaboration, known as work-education partnerships, that focus on educational reform and on strengthening the links between education and the workplace for economically-disadvantaged youth. Much more complex and sophisticated than traditional school-business

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partnerships such as Adopt-a-School programs, these partnerships are designed to bring about substantive change in the existing system by changing the nature of school-business partnerships (Lacey & Kingsley, 1988).

Both the Edna McConnell Clark Foundation (Lacey & Kingsley, 1988; Lefkowitz, Kingsley, & Hahn, 1987) and the National Alliance of Business (NAB) (1989) have been involved in fostering work-education partnerships in a number of cities throughout the country. Designed to bring an array of public and private resources to bear on the transition from school to work, both the Edna McConnell Clark Foundation and the NAB projects sought to form and sustain alliances among groups of employers rather than individual firms, among school systems rather than single schools, and using combinations of government and private funding rather than a single source. The experiences of these projects provide valuable lessons to businesses wishing to strengthen the relationship between education and work.

What Makes Effective Work-Education Partnerships?

By their very nature, work-education partnerships vary. They take place in different communities under unique circumstances, involving distinctive sets of key players. Nevertheless, an examination of the reports by Lacey and Kingsley (1988) and NAB (1989) reveals that effective partnerships share a number of common elements:

- Brokering. An intermediary or "broker" is crucial for developing links among all the players in a successful work-education partnership. In order for brokers to facilitate cross-sector collaboration, they must be able to operate in several contexts. Brokers help translate differences in terminology, context, and cultures and help create a sense of common ownership among the key players. Once established, the broker may become responsible for governance of the partnership.
- Involving the Right Players. Partnerships achieve their maximum potential when the right mix of people from many organizations are involved. A core group of high-level leaders from the various sectors who endorse the mission of the partnership and agree to share the risks and benefits equally is essential for success.
- Ensuring Commitment. Commitment to the partnership is fostered by developing a sense of ownership among the various organizations. The commitment must be long term, sustained, and emerge from all sectors involved in the partnership. Top-level leaders should understand that there are no "quick fixes" and must be willing to assign time, money, and human resources to the partnership effort.
- Developing a Formal Plan. Formal plans that include both long- and short-term goals, measurable objectives, concrete tasks, and specifications defining responsibilities and deadlines provide a foundation for successful partnerships. Goals serve as an incentive and as a means for measuring accountability. In addition, a collaborative process for deciding goals and objectives can ensure consensus and expand ownership of the project. The best plans include an obvious chain of command, are signed by all top leaders, and are publicized.
- Implementing the Plan. Establishing an organization to manage the day-to-day operation of the partnership and evaluate its efforts is important. The management role may be assumed by the Private Industry Council, the local Chamber of Commerce or by an organization created especially for the purpose of managing the partnership. The management function may emerge from the initial brokering efforts of an intermediary organization.
- Maintaining the Partnership. Partnerships must be cultivated and maintained. Time and effort should be devoted to preparing for the inevitable changes that will result over the life of a partnership. For example, evaluation results will often mandate procedural changes. Original partners may withdraw and new ones may be recruited to take their places. The partnership must be nurtured and sustained in order to maintain its vitality.

What Next?

By the year 2000, will every American business be involved in strengthening the connection between education and work? Certainly the results of the *Fortune* survey (Kuhn 1990) are encouraging since they indicate that business is involved with public education in a variety of ways. The challenge now is to channel this involvement into the development of the type of work-education partnerships fostered by the Edna McConnell Clark Foundation and the NABO. However, for these partnerships to be successful, business must increase its understanding of the type of educational reform required--that which facilitates and enhances school-to-work transition.

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The Community College Role in Achieving Adult Literacy

by Dana Nicole Williams and Anita Y. Colby

In February 1990, President Bush and the nation's governors adopted new goals for education, including the goal that:

> By the year 2000, every adult American will be literate and will possess the skills necessary to compete in a global economy and to exercise the rights and responsibilities of citizenship.

Within the national goal, five specific subgoals address various aspects of adult literacy: strengthening the connections between education and work; educating workers to adapt to changing technologies, work methods, and markets; providing educational opportunities for part-time and mid-career students; increasing the number of minorities who successfully complete college programs; and increasing the proportion of college graduates who think critically, communicate effectively, and solve problems in the natural sciences, social sciences, and humanities. In the past 2 decades, community colleges promoted adult literacy on their campuses and within their communities. Each subgoal corresponds to an important part of the community college mission.

Community college services and resources often fit precisely with the needs of adult literacy training. "Some observers believe that community colleges are the best bet for long-term growth of the basic skills field, because those institutions already have a diversity of resources, a long track record of working with business and government on training issues, and usually, strong support from state and local governments. They also allow the learner to avoid the stigma of 'going back to school' and provide a ready vehicle for transition from basic skills training to training and certification in specialized fields" (Chisman, 1989, p.12). The following examples illustrate community college involvement in literacy services.

College Literacy Programs

The Maricopa Community College District in Phoenix, Arizona, has initiated a joint effort with a volunteer committee of the Public Relations Society of America, the Arizona Department of Education, and the Literacy Volunteers of Maricopa County (Stevens & Piland, 1987). Volunteers teach functionally illiterate adults to read and write at no charge, and offer an 18-hour training workshop for tutors. The District organized a volunteer recruitment drive among students and faculty to address the program's twin problems of too few volunteers and not enough money.

Project LIFE at South Plains College in Lubbock, Texas, also involves a coalition of community agencies (South Plains College, 1988). The project aims to increase public awareness of the complexities and problems of adult illiteracy while promoting literacy as a value within the community. Project LIFE combines the resources of the major literacy providers in the area to provide training and prevocational workshops to enhance employability and career adaptability.

The direct provision of instruction in reading and writing is not the only way that community colleges are involved in literacy development. Other activities, many of which relate to the national goals and subgoals, include the following:

Coordination of Activities. The delivery of literacy services is a multifaceted effort, including "public school systems, community organizations, storefront operations, corporate training classes, proprietary institutions, volunteer tutoring programs and every possible variation of these and other service-delivery modes" (Chisman, 1989, p.12). Some feel that the best role for community colleges is to serve as a connecting agency, helping these groups to develop broad- based community-wide efforts (Stevens & Piland, 1987).

Tutor and Instructor Training. Most of the teaching force in the field of adult literacy training is comprised of volunteers and K-12 teachers working part-time. Many of the school teachers have little training in methods for teaching adult students and the volunteers have almost no training.

The Literacy Education Action (LEA) program at El Paso Community College began as an independent program and evolved into a network of community literacy groups (Clymer, 1989). LEA recruits and trains volunteer tutors

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and uses a language experience approach to assist native English speakers, Spanish-speakers, and bilingual students.

Post Literacy. Most community college literacy services are not designed for adults reading at the lowest levels. Instead they focus on raising students' skill levels to the point at which they can obtain a GED certificate or enter college- level courses. Depending on students' entry skill levels, progress can take hundreds of hours (Mikulecky, 1990). During this period, community colleges incorporate all of their expertise in remedial instruction and student retention to ensure steady progress and prevent student frustration and withdrawal. Chisman (1989, p.15) advocates an adult literacy delivery system "that will accept any adult at any level of skills and move him or her along a continuum to at least the level of basic skills required to function effectively on the job and in everyday life, today and in the decades to come."

Services for Learning Disabled Students. A study by Keefe and Meyer (1988) of adults in basic education programs found that more than 75 percent of those adults reading below the level of the average 8-year-old have diagnosed learning disabilities and close to 90 percent have uncorrectable vision problems. Existing community college programs for learning disabled students can accommodate many adults who have obtained some measure of literacy through other venues, as well as providing diagnostic testing.

Workplace Literacy. Several of the national literacy goals focus on technological literacy and workforce productivity. Community colleges have long been involved in providing customized job training for local businesses. Many colleges and businesses are building on these contacts so that basic skills training for workers may be provided by community colleges on a contract basis (Chisman, 1988).

Computer-Assisted Instruction. According to Askov and Clark (1991) computers have the following advantages for adult literacy instruction: privacy, individualization, better-than- average achievement gains, cost-effectiveness, student control of learning, schedule flexibility, open-entry/ open-exit operations, and transferability of familiarity with computers into various work settings. Many of the disadvantages noted by Askov and Clark, such as lack of staff expertise and training, are not applicable to community colleges, which tend to have prior experience with this form of instruction.

The Center for Advancing Technology at Piedmont Community College in North Carolina has developed a computer-based model for rural, adult education (Bailey & Rentz, 1989). The Center has established an adult computer lab, offering orientation, instruction, drilling, testing, and learning styles surveys.

Program Evaluation

The field of adult literacy has been negatively affected by the lack of meaningful program evaluations at state, institutional, and program levels. As Chisman notes, "the lack of adequate measurement tools also means that we have only very crude ways to assess the abilities or progress of individual learners, to evaluate the effectiveness of programs, or to measure the progress of the nation as a whole toward national goals." Padak and Padak (1991, p.374) cite three recent surveys that indicate that "evaluations are either seldom undertaken or are reported in ways that make meaningful interpretation difficult." Community colleges can make a major contribution to the field of adult literacy by conducting program evaluations that will answer important questions about program participants, such as the length of time they persist, the amount of in-class and out-of-class time they devote to learning, and the number of people who are actually learning according to specific attainable measures.

Padak and Padak's model for program evaluation includes variables related to the personal and academic growth of participants and the value added to the quality of their lives. The model also identifies program features to be considered in the evaluation, including personnel qualifications, collaborative networks, student-teacher relations, and program content. The remaining components of the model relate to external factors, such as financial gains afforded participants, returns on investment, and rate of participation.

Conclusion

Community colleges are in an ideal position to play a significant role in combatting the nation's literacy problem. To do so, however, will require additional leadership and funding from state and federal sources; the recruitment and training of faculty to work with students reading below the fifth-grade level; the provision of transportation, child care, textbooks, and other services to overcome the barriers to education faced by many illiterate adults; and a more flexible manner of delivering instruction that allows students to progress at their own pace (Stevens & Piland, 1987). Even without meeting all of these conditions, community colleges can have an impact on literacy in their communities by joining forces with other agencies, institutions, and groups.

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The Role of Libraries in Literacy Education

by Linda Schamber

Illiteracy among Americans, with its social and economic implications, has become a growing concern in recent years. National awareness of problems associated with limited literacy skills has led to legislation, beginning at the federal level, to fund new literacy programs and expand existing programs. Libraries and information centers are viewed as an important component of this massive educational effort. Accordingly, library and information services for literacy was one of three major themes of the 1991 *White House Conference on Library and Information Services*, held in Washington, D.C., July 9-13, 1991.

National Awareness and Support

Generally, literacy is considered to be the ability to read, write, speak, and compute at a certain level. Functional literacy involves skills needed to cope at an adult level in everyday situations, such as reading a newspaper or completing a job application form. People who lack these abilities often are members of populations suffering from poverty, crime, and unemployment. According to 1983 statistics from the U.S. Department of Education, there were 27 million functionally illiterate adults in the country, and 47 million more were having difficulty in some of the domains tested (Davidson, 1988). The current extent of the problem is thought to be much greater than these figures indicate. The need for programs to increase literacy has been acknowledged through support from the federal government, from many organizations in the education and library and information fields, and from business and industry.

In 1990 Congress produced two comprehensive pieces of legislation affecting literacy programs: the National Literacy Act passed by the Senate, and Literacy for All Americans, part of an omnibus education bill passed by the House of Representatives. A compromise bill was developed by a joint committee, but was not voted into law in 1990. Separate bills are expected to be introduced again in the House and in the Senate in 1991. Also in 1990, the Library Services and Construction Act (LSCA), which has supported a variety of programs, including literacy programs, for more than 20 years, was reauthorized with new language and suggestions for increased appropriations for 1991. In fiscal year 1989, 214 library literacy programs in 47 states were funded through LSCA Title VI, and in 1990, 237 received support (Humes & Cameron, 1990).

Library literacy programs have also been funded by state and local resources or by individual donations, or coordinated through literacy organizations. In addition, new literacy organizations hold promise for assisting libraries in implementing literacy programs. Two that focus on the needs of special groups are the Barbara Bush Foundation for Family Literacy and the National Center for Family Literacy. Both provide funding and training for program development, and information to program providers and government policymakers (Talan, 1990).

Need for Commitment

Quezada (1990) reports on a national forum on literacy for state libraries, held in May 1990, intended to generate recommendations for shaping a national library literacy policy. While some participants initially viewed libraries as playing only a supporting role to education, a stronger position eventually emerged: that of libraries as lifelong learning centers, with education an essential part of their mission. In this role they must actively commit time and resources to coordinating literacy activities at all levels. "Public, special, academic, and institutional libraries have a responsibility," Quezada says, "to promote literacy among all members of their community, users and nonusers alike" (p. 23). She also notes that "The American Library Association's official position on the role of libraries in the area of literacy *encourages* library involvement and places *no limitation* on how libraries should be involved in literacy education" (p. 24). The results of the forum were these priorities for recommendation at the 1991 White House Conference on Library and Information Services:

- incorporate into existing legislation the concept of the library as an educational agency;
- develop a strategy for more stable funding for literacy;

- continue to improve evaluation, research, and dissemination of library-based literacy efforts by libraries and other literacy providers;
- redirect administrative responsibility for LSCA titles related to literacy directly to the state library agency (p. 24).

In addition to the legislative priorities, at least three challenges are implicit in the call for research and evaluation. One problem is the lack of current data on the extent of illiteracy. Another is the lack of comparable data on the effectiveness of different literacy programs. Finally, there is no agreement on the fundamental meaning of *Literacy*. Beyond the definition of literacy as the basic *3 R's* skills for adults, some writers include concepts of information or computer skills; others include concepts of family, community, or cultural literacy.

Library Services for Literacy

Over the years, many libraries have supported literacy education efforts by providing teaching resources, space for tutoring, and information and referral services. Some program sponsors have compiled bibliographies of adult new reader materials—materials that are not too "childish" to appeal to mature learners and that respond to their personal interests, such as getting a driver's license. Others have adopted or developed software programs that provide interactive drills and testing for computer-assisted learning.

A more active approach has been taken by libraries offering literacy classes or one-to-one tutoring programs. Many libraries have outreach programs designed to meet the needs of specific groups of people with limited literacy skills. For example, people for whom English is a second language, who present a diversity of first languages and literacy levels, have been reached through tutoring programs with materials that match their cultures and interests. Appropriate materials have also been distributed to the institutionalized, including those in prisons, hospitals, rehabilitation centers, and group homes for the elderly and disabled. Intensive prison programs, coordinated under a literacy librarian, have offered specialized software and English-as-a-second- language training (Mathews, Chute, & Cameron, 1986).

In addition, some libraries offer programs for groups at risk for literacy-related problems. Adolescents have been targeted because illiteracy has been associated with other problems including crime, pregnancy, unemployment, drug and alcohol abuse, and school failure. After-school and summer literacy programs have sought to encourage young people to become employable, contributing members of the community and generally to raise their self-esteem. Strategies have included homework help sessions, peer tutoring, and peer-group reading sessions (Davidson, 1988).

Families have been targeted because illiteracy seems to be passed from one generation to the next: children whose parents are functionally illiterate are twice as likely as their peers to be functionally illiterate. In family literacy programs, emphasis is on the parent's role as the child's first teacher. Parents, who may have been inspired to seek literacy training by concern for their children, are taught interactive language activities for use with infants and young children. Some libraries invite entire families to share in reading activities and booktalks, with each member borrowing a book to take home (Talan, 1990).

Many resources exist for libraries interested in literacy education. Project reports, guidance manuals, and bibliographies have emerged from successful library-based literacy programs. Much information is also available through statewide literacy coalitions and various literacy organizations.

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ERIC Clearinghouse on Rural Education and Small Schools

Adult Literacy Programs in Rural Areas

by Susan Ferrell

The literacy of rural adults is receiving renewed attention nationally. This Digest examines the goals of rural literacy programs and the types of programs that have been effective in the past. It includes the various definitions of literacy applied in effective rural literacy programs. It also examines the conditions that support— or limit—the widespread influence of effective programs in rural areas.

Concern for Adult Literacy in Rural Areas

The level of concern over adult literacy in rural areas varies with economic, social, and political changes. In the United States, policymakers express greatest concern when the need for economic development or recovery seems most pressing, as in the present rural economic crisis.

Many policymakers believe high rates of adult literacy to be a condition of rural economic development. Hence, their concern logically addresses the literacy of citizens with the most visible need to improve their economic well-being, the poor. In the United States, many poor citizens live in remote rural communities. Moreover, throughout the world the rates of both poverty and of adult illiteracy are highest in rural areas (for example, Behrstock, 1981).

The Goals of Adult Literacy Programs in Rural Areas

Knox (1987) reports that adult basic education—including literacy instruction—serves one of four purposes: (1) promoting economic productivity; (2) stimulating political change; (3) increasing social equity; and (4) enhancing quality of life. In the United States, literacy efforts on behalf of rural citizens most frequently address the first of these purposes.

Akenson (1984) develops this theme in his comparison of the Southern Literacy Campaign (1910-1935) with current efforts to promote literacy in the rural South. "Industrial efficiency" was a prime concern of the earlier programs. Today, similar results are expected from programs to prepare rural workers for the "information age." Both efforts emphasize the improved productivity of rural economies (Akenson, 1984).

Another goal of literacy efforts has been to support democratic political reform. The work of Brazilian educator Paulo Freire with rural peasants best represents this approach. By helping peasants label both their anger and their dreams, literacy campaigns of this type help citizens define their own political destinies. In more highly developed nations, such efforts have also been proposed to address the needs of an emerging underclass (for example, Aronowitz & Giroux, 1985).

Closely related to the political aim of literacy work is the goal of promoting social equity. Literacy workers have noted that the nation's poorest citizens, whether rural or urban, are those least likely to participate in programs (Quigley, 1990). According to this view, literacy efforts can actually widen the gap between the "haves" and the "have nots." Some writers note, however, that this effect is rare: even the poorest citizens get some benefits when the literacy of their somewhat more fortunate neighbors improves. Cameron (1987, p. 175) reasons, "As programs prepare better qualified and motivated people for occupational advancement, lower-level jobs become available for less skilled or less experienced workers."

A final perspective on adult literacy, however, rejects the logic of both of these competing views. Supporters of this view (for example, Kozol, 1985) see literacy as a worthy end in itself. They interpret literacy—like oral language—as the birthright of all humans, and they stress the role literacy plays in cultivating human potential. They believe all political, economic, and social improvement depends on *universal* literacy. In rural areas, this view may have special meaning for post-literacy programs, discussed in the next section.

Rural Programs That Address Various Types of Adult Literacy

Literacy programs in rural areas vary with the definitions of literacy they adopt. Chall, Heron, and Hilferty (1987) identify three types of programs that define literacy in different ways. Volunteer programs work mainly with *illiterate* adults. They serve adults whose reading achievement is below the fourth-grade level. Competency-based programs, on the other hand, work with adults who already have basic reading skills, but need

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more advanced academic skills if they are to become *functionally* literate by modern standards. Competency-based programs usually define literacy as the minimum skill required for a high school diploma or its equivalent.

Fingeret (1984) describes these two types of programs as "individually oriented programs." She faults them for approaching adult illiteracy as deficits of individual persons. These programs, she claims, offer instruction that emphasizes reading skills in isolation from meaningful context. Both Chall and Fingeret distinguish the first two types of programs from programs based in the community. Rather than valuing just one kind of learning, community-oriented programs help adults determine their own learning needs, based on the norms of their communities. These programs, therefore, provide instruction that may or may not have an academic focus.

Post-literacy options help sustain the effectiveness of the three types of literacy programs. They offer newly literate adults the chance to continue their education, practice new skills, and make positive changes in their lives.

Such programs are extremely important for sustaining literacy gains in rural areas, particularly when limited economies keep literate adults from applying their new skills in new jobs. If adult students can see literacy as worthy in itself, then they may be more likely to continue to maintain and develop it, whatever the local economic situation. Hence, programs in rural areas with enduring economic problems might better view the development of literacy in terms of quality of life.

Effective Rural Literacy Projects in the United States

Among adult literacy programs in rural areas of the U.S., some offer a single service and others provide a variety of services (Lucas, 1985). Alaska's *Centralized Correspondent Study Handbook for Grades 1-12*, for example, provides the framework through which rural residents can complete correspondence course work at no charge. Teleteacher, a telephone-based system in Virginia, enables rural residents to have access to academic assistance 24 hours a day. A program in Alabama uses a statewide educational television network, learning centers, and home tutors. A weekend program in New Jersey offers a variety of counseling services, sponsors independent study projects, and administers subject area examinations.

Project Communi-Link reaches 26 selected rural communities in 14 western states. Communi-Link is a system that structures working relationships among a variety of organizations. It works to help rural communities improve the social and economic well-being of residents through expanded opportunities for Adult Basic Education and GED preparation. Two Pennsylvania projects—Regional Utilization of Resources to Aid Literacy (RURAL) and Grass Roots Alternative Diploma Study (GRADS)—are also examples of this approach.

Finally, technology increases the potential to reach adults in rural areas. Literacy programs are developing out-of-school strategies that use media to deliver instruction. These media include films, newspapers, radios, records, audiotapes, various periodicals, and satellite broadcasts. In addition, some literacy and post-literacy programs have direct ties to business and industry, and others make use of resources available in two- and four-year colleges (Chall et al., 1987; Hone, 1984).

Conditions that support—or limit—effective rural literacy programs:

Some conditions limit the scope, and sometimes threaten the survival, of effective programs. Inadequate funding reduces the potential impact of literacy efforts (Kozol, 1985). The funding that does exist may be divided among a variety of agencies, all competing for a share of it. This competition makes it difficult for agencies to coordinate their efforts.

Moreover, the clear goal of many rural literacy programs— improving rural economies—poses a potential threat to even the most effective programs. Despite their goals, these programs nonetheless tend to define their success in terms of increased literacy, not economic improvement. If the advertised economic benefits fail to develop, these programs can lose the support of external funding sources.

Despite these problems, however, rural literacy programs manage to persist and to succeed. Successful programs share certain features. According to Hone (1984), effective programs address local needs, satisfy the expectations of their clients, entail cooperation among agencies, and promote program benefits in clear language. Involving community members in the development, promotion, and evaluation of literacy programs gives rural residents a stake in making these programs work (Kozol, 1985).

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Recruiting and Retaining Language Minority Students in Adult Literacy Programs

by Shirley Brod

As the nation has become aware of the scope of adult illiteracy and its tremendous cost, literacy programs have proliferated. New populations of language-minority adults are becoming involved in an increasing number of these programs. They include refugees whose training is no longer funded by the Office of Refugee Resettlement and newly legal "amnesty" clients who have come into Adult Basic Education programs from classes conducted under the Immigration Reform and Control Act of 1986. How can recruitment and retention of these and other students in literacy programs be enhanced?

Recruitment

The most powerful tool for recruitment in education is still word-of-mouth publicity generated by satisfied students. A variety of media approaches have also been used to reach potential students, including radio and television announcements, newspaper articles on successful programs and students, and brochures distributed in neighborhood churches and shopping areas. Celebrations of student progress for former students and the families of the students who are being honored also help establish a high profile in the community and enhance student self-esteem. In many sites, open-entry, year-round programs make it possible for clients to find classes whenever they are ready for them. Finally, systematic efforts to maintain contact with former students may bring "dropouts" back to the program.

Attrition

Attrition has long been a problem in adult education. Cain and Whalen (1977) calculated an attrition rate of 40 to 60 percent for adult literacy programs in the United States. According to a study of attrition in urban literacy programs by Bean, Partanen, Wright, and Aaronson (1989), three kinds of factors contribute to attrition: those stemming from the student's personal situation; those attributable to the program or service provider; and external factors resulting from a lack of assistance from outside agencies in areas such as transportation and child care.

Personal factors

In the Bean et al. 1989 study, most of the reasons cited by adults for dropping out of programs were personal in nature. The most commonly designated are:

- *Low self-esteem, coupled with lack of demonstrable progress*. This may result from negative educational experiences. Bowren (1988) believes the major cause for dropping out is lack of progress, real or perceived.
- *Daily pressures*. Work schedule was the personal factor mentioned most frequently by students in the Bean et al. (1989) study. A study by Taylor (1983) designated child-care needs and lack of transportation as the major obstacles to attendance.
- *Negative perception of the value of education* (Cross, 1981). This included lack of support by the native culture for education and a family background of illiteracy.
- *Age*. Older individuals may feel they are too old to learn at 45 or 50; such an attitude may become a self-fulfilling prophecy, if the risk of failure seems too great.

Program factors

When participants in Bean's study were asked what would have kept them in the program, most cited the need for an increase in student-centeredness in program design and implementation. Current research on how adults learn shows their need to define or select their own goals. Other program factors that contribute to student drop-out include the following:

- *Lack of appropriate materials for very low level learners*. Some students have such minimal English that the materials used in the program are not comprehensible.
- *Inappropriate placement*. This may be caused by a discrepancy between the student's oral and literacy skill levels, or by use of an inappropriate testing instrument.
- *Lack of opportunity to achieve success*. This may result from inappropriate placement, or from a failure to set short-term goals with opportunities for measurable progress.

- *Poor tutor/student or teacher/student match.* A sensitive tutor/student match is very important, as is monitoring that relationship.
- *Lack of flexibility in class scheduling.* Many adult students are juggling job, family, and other responsibilities, and need flexible school schedules.
- *Literates and nonliterates in the same class.* This frequently results in lack of sufficient instructional time or individual attention for nonliterate students, who may have few independent learning strategies.
- *A poorly thought-out and executed intake process.* Intake that is slow, cumbersome, and impersonal, and that often may include an intimidating test, can discourage students.
- *Lack of peer support and reinforcement.* Adults who feel they are working alone, without the structured support of those who are like them and with whom they can identify, can become discouraged.
- *Instructional material not relevant to students' needs and lives.* Instructional materials that are too simplistic or that are of little relevance to the learners' life situations may insult learners and affect participation.

External factors

Literacy programs need to network with social service agencies to provide additional support services that enable adults to participate in classes on a regular basis. The following services are generally available in the community and should be accessed by the literacy program: health care (including eye exams and glasses); child care; transportation; and counseling support.

Retention

Obviously, resolving the problems that contribute to attrition should enhance retention. Smith-Burke (1987) lists four key factors that serve as retention motivation for the adult literacy student: (1) peer support; (2) perceived progress in developing literacy skills; (3) heightened self-esteem; and (4) a good teacher.

- *Peer support.* Peer support serves adult students' needs for socialization and interaction. A supportive peer group not only provides an effective component for learning, but also increases opportunities for individuals to participate in relatively risk-free small-group environments (as opposed to being "on the spot" in a tutor/student pairing). Peer counseling, buddy systems, class discussions, and cooperative learning are all examples of ways in which peer support groups can be shaped (Taylor, 1983). Group work can offset the problems associated with large classes.

Bean et al. (1989) conclude that, "Programs may need to be more ready to move an individual from a one-on-one tutoring situation to a potentially more supportive group-learning environment." Perhaps a hybrid of peer support and individual attention should be considered in order to provide students with the strengths of both environments.

- *Perceived progress in developing literacy skills.* A program, teacher, or student may set such ambitious long-term goals (e.g., to obtain a GED) that they are soon perceived by the student as unattainable, even if the teacher can see progress. If the teacher breaks tasks down into small, realistic chunks (e.g., write a simple sentence from dictation; locate the cause and effect in a GED social studies lesson) and students see the progress they are making, then the situation is likely to lead to perception of success. Feedback from the teacher or from peers can solidify this perception of progress and motivate continued involvement in the program.

- *Heightened self-esteem.* Feeling good about oneself and one's capacity to learn grows naturally from the support of friendly peers and teacher/tutors and from students' perception of their own progress. Programs that understand adult learners' needs, treat learners with respect, give learners the opportunity to participate in ongoing goal setting, and endow them with the responsibility for their own learning, not only build learners' confidence in their own abilities, but also provide them with tools for independent learning.

- *A good teacher.* "Retention is an indicator of quality teaching" (Taylor, 1983), and retention of teachers and tutors is an indicator of a quality program. Bean et al. (1989) conclude that literacy programs need to provide training for their tutors to help them develop appropriate strategies to address the special educational, social, and emotional needs of adults who have not been successful at school. Programs that include language minority adults need to provide staff with cross-cultural training to help teachers understand culturally and linguistically diverse students and their special needs.

Students are not the only ones who need to experience success. A program that listens to the needs and concerns of its teachers and provides assistance quickly and in a supportive way can promote the sort of caring teaching/learning environment that is the basis of retention and accomplishment for teachers and students alike.

Conclusion

Successful literacy programs work because educators listen carefully to students to help them define and work toward their own goals. They help students manage logistical problems that interfere with attendance and provide appropriate materials and mentors, while setting up learning tasks through which the students experience and are recognized for success. "Most students will be inspired when they feel in control and secure in their classes, respected by their teachers and their peers, and hopeful about their future academic success" (Duryee, 1989).

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Goal 6: Safe, Disciplined, and Drug-Free Schools

By the year 2000, every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning.

Objectives

- Every school will implement a firm and fair policy on use, possession, and distribution of drugs and alcohol.

- Parents, businesses, and community organizations will work together to ensure that schools are a safe haven for all children.

- Every school district will develop a comprehensive K–12 drug and alcohol prevention education program. Drug and alcohol curriculum should be taught as an integral part of health education. In addition, community-based teams should be organized to provide students and teachers with needed support.

Are School-Based Drug Prevention Programs Working?

by Caroline E. Mohai

With the passage of the Anti-Drug Abuse Act of 1986, the federal government significantly expanded the delivery of drug prevention programs to school-aged youth. In fiscal year 1987, more than $300 million federal dollars were allocated to in-school drug prevention programs (U.S. Dept. of Education, 1987). What has been the outcome of this expanded effort?

The news is encouraging. Use of illicit drugs and, to a lesser degree, alcohol, among school-aged children and adolescents appears to be on the decline, although researchers are quick to point out that the percentage of American youth engaged in substance use is still unacceptably high (Johnston, Bachman, & O'Malley, 1990). Does this overall decline in use mean our prevention efforts are working? What have we learned f om this intense period of prevention program development?

Learning From Our Mistakes

During the past decade, a number of strategies have been employed to change the attitude and behavior of children and adolescents regarding drug use. Research has shown that programs relying solely on providing information are not only ineffective, but may actually result in a greater likelihood of drug experimentation (Bangert-Drowns, 1988; Fustukjian, 1990). However, an annual survey conducted for 16 years by the University of Michigan Institute for Social Research (Johnston, 1990), with followup on a subset, concludes that providing youth with information about health risks in conjunction with other prevention approaches is highly effective. Key to its effectiveness, however, is giving information that emphasizes the more immediate, short-term consequences of drug use.

Other approaches that have turned up mixed results include those seeking to strengthen drug-use resistance by bolstering "life skills" (decision-making ability, coping skills, and self-esteem) and those striving to address the unmet social and psychological needs of youth (U.S. Dept. of Education, 1987; Fustukjian, 1990; Ellickson, 1987). General criticisms leveled against current efforts include:

- Programs are not structured to respond to youth of varying ages, from different settings, and of different ethnic backgrounds (Baer, 1988).
- Programs do not effectively identify and offer services to at-risk children and their families (Lachance, 1989).
- Programs are fragmentary in their approach and are not coordinated with community prevention efforts (Fustukjian, 1990; U.S. Dept. of Education, 1987).
- Programs do not start soon enough—kindergarten is not too soon (U.S. Dept. of Education, 1987; Lachance, 1989).
- Programs do not contain a strong evaluative component (U.S. Dept. of Education, 1987; Bangert-Drowns, 1988).

Evaluating Current Drug Prevention Programs

Although research has shown what approaches have not been effective, it has been less clear about what has worked. This is largely due to serious flaws in drug prevention program evaluation. In his assessment of school-based drug prevention programs conducted for the U.S. Department of Education, Michael Klitzner (U.S. Dept. of Education, 1987) described six common weaknesses of program evaluations:

1. **Poor Research Design.** Two few subjects, loss of subjects through attrition, and lack of controls are common weaknesses found in study design.
2. **Rush to Get Results.** Evaluations are too often begun before the program has had sufficient time to have an effect.
3. **Insufficient Process Analysis.** Many programs do not sufficiently document implementation procedures. Knowing how the program was implemented is critical to understanding program outcomes.
4. **Not Enough Attention to Intervening Variables.** Determining what variables have affected a program's outcomes is basic to understanding program effectiveness. A program's basic hypothesis or premise should guide variable selection. Unfortunately, many prevention programs lack an underlying premise; thus, evaluations fail to monitor the variables most critical to a program's success.

5. Weak Outcome Measures. Prevention programs have traditionally relied on self-reports to assess their effectiveness. Self-reporting is not the best means to assess a program's influence on student attitudes and behavior since student responses can be shaped by what they think administrators and teachers want to hear.

6. Statistical vs. Practical Significance. Program planners too often draw conclusions about general program results from the statistical significance of a particular program feature. A statistically significant finding is not necessarily programmatically significant.

Building a strong evaluative component into drug prevention program models is key to increasing knowledge about what works. State departments of education and other funding agencies must dedicate more resources toward providing the technical assistance needed to ensure sound program design and evaluation (U.S. Dept. of Education, 1987; Bangert-Drowns, 1988; Milgram, 1987). Also, local schools and community leaders, understandably eager to show results, must overcome the temptation to pass over program evaluation. A way to ensure more rigorous evaluation is to include students, school personnel, parents, and community leaders in the drug prevention planning process from the beginning (Milgram, 1987).

What We Know Works

Although the assessment of many prevention approaches has been flawed, several programs have provided valid evidence that certain approaches are effective.

One such program is Project ALERT. Begun in 1984 at 30 junior high schools in California and Oregon, Project ALERT is based on the social influence model, which targets adolescent drug-use beliefs and resistance skills. Results have been encouraging. One program element proven to be especially beneficial is the "booster" curriculum that extends the drug prevention program effects beyond the targeted grade level (Ellickson, 1990).

Providing further validation to the social influence model is the Midwestern Prevention Project (MPP), begun in 1984 as a collaborative effort between industry (Marion Laboratories), a research institution (University of Southern California's Institute for Health Promotion and Disease Prevention Research), and the Kansas Public Schools. MPP employs strategies such as role playing, group feedback, and mentoring to reshape adolescent attitudes about drug use. It also extends its influence to the family through homework assignments that challenge family drug-use beliefs and habits. Junior high students involved in the program have shown a significant change in their drug-use attitudes and behavior (MacKinnon, 1991).

Other approaches showing promise include:

1. Targeting families. Research has shown that parental attitudes play a large role in shaping children's beliefs about drug use. Strategies to change family drug-use attitudes include improving parenting skills in order to develop better communication and structure in the home. Parent-led support groups are another popular mode of intervention (U.S. Dept. of Education, 1987; Pearish, 1988). The Parent Involvement Program (PIP) is such an effort, providing first-time offenders and their parents or guardians counseling sessions on family communication skills and the dangers of drug use (OERI, 1990).

2. Enforcement of a clear "no drug use" policy. Sending a clear "no use" message requires that schools consistently stress that drug use is wrong and enforce consequences for school drug activity (U.S. Dept. of Education, 1989).

3. Enhancing trust between adults and children. This approach promotes greater opportunities for personal interactions between adults and youth, thereby elevating adults into more powerful role models (U.S. Dept. of Education, 1987; Milgram, 1987). One such program uses after-school jobs to pair at-risk youth with understanding adults who act both as professional mentors and friends concerned about the youth's success at school and in life (OERI, 1990).

Conclusion

The jury is still out on the effectiveness of many specific drug prevention strategies, primarily because of poor program evaluation design. However, two programs have provided clear evidence, through their strong methodological design, that interventions based on the social influence model are effective. Regardless of strategies employed, all prevention programs must start early, involve coordinated efforts with the community, include students, parents, teachers, and community members in the planning process, and implement a systematic and comprehensive program that is based on a clear hypothesis, contains different strategies for different populations, and gives special attention to the needs of at-risk students.

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Alcohol and Drug Use Among Adolescents

by Laurie LaChance

Drug use among children has been reported to be ten times more prevalent than parents suspect (U.S. Department of Education, 1986). The percentage of students using drugs by the sixth grade has tripled over the last decade. Now one in six 13- to 17-year-olds has used marijuana. Nearly two-thirds of all American young people try an illicit drug before they finish high school (Johnston, O'Malley, & Bachman, 1985).

The following questions must be answered if those in a position to intervene are to acquire the tools for overcoming this pervasive problem: (1) Why does substance abuse exist? (2) How do we identify substance abusers? (3) What is the role of the school? and (4) What are the components of successful prevention programs?

Incidence

A survey of men aged 21 to 59 reported by the National Institute on Alcohol Abuse and Alcoholism found the highest proportion of drinking problems among the group aged 21 to 24 (Department of Health and Human Services, 1982). These studies suggest that alcohol problems begin early among the youth in the United States, increase continuously in each school year, and peak during students' collegiate and post-graduate years.

Although prevalence of use of some drugs may be down, the *intensity of use* may be going up (McCurdy, 1986). Today's drugs are more potent and addictive than ever. For example, marijuana today is five to twenty times stronger than it was previously. Crack, the highly addictive form of cocaine which is smoked (a particularly dangerous and psychologically addictive method of use), and the so-called new "designer drugs" (analogs of certain illegal drugs) have been known to cause permanent brain damage. Slight increases are also being seen in the use of inhalants and PCP (phenocycliden). In fact, daily use of inhalants, PCP, and cocaine have become more prevalent than ever (Johnson et al., 1985; McCurdy, et al., 1986).

Causes of Substance Abuse

Social pressures from peer, family, and societal role models are at the top of the list of reasons why adolescents take drugs. Predisposition toward rebelliousness, nonconformity, and independence also figure prominently (Towers, 1987). Also, a high correlation has been found between parental drug use and abuse and drug abuse patterns among their children (Kandel & Yamaguchi, 1985). Some experimentation with mind-altering substances appears to be part of the adolescent "rites of initiation" (Bratter, 1984). During the 1950s, any drug use was considered to be pathological. Thirty years later, in contrast, abstinence from drugs can be defined as "deviant" (Collabolletta, Bratter, & Fosbender, 1983).

Stepping-Stone Theory

There has been much debate about sequential use of drugs. It is likely that the use of a particular drug makes the use of the next drug in the sequence, considered the next most risky or deviant, seem a smaller and more acceptable step. The progressively greater legal tolerance for marijuana, although it may be seen as desirable for reasons of political philosophy, is not a favorable development from the point of view of public health. While all marijuana users do not go on to use harder drugs, they are, nonetheless, the population *at risk* for the use of harder drugs. When the use of marijuana expands, the population at risk grows.

It is important to note that alcohol precedes marijuana in the developmental sequence and that alcohol serves as a gateway to other drug use. Stated simply, alcohol use precedes all other drug use.

Identification of Adolescent Substance Abuse

Identifying the adolescent alcohol abuser is difficult but possible. Early recognition can result in early intervention and treatment, which is essential because frequent and heavy use of any drug among adolescents is often a coping mechanism for dealing with personal problems that need to be confronted and resolved if normal development is to occur. When drugs are used to cover feelings and to cope with stress, normal adolescent social and psychological growth is blocked.

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Specific behaviors and characteristics to watch for to determine whether alcohol or other drug abuse is occurring include, but are not limited to, the following:

- frequent absenteeism,
- decline in academic performance,
- conflicts with authority figures,
- problems with peers,
- new peer relationships
- evidence of self-destructive behavior,
- avoidance and distancing,
- depression,
- lack of energy,
- impulsive behavior,
- lack of concern about personal well-being and hygiene,
- obvious signs of intoxication,
- evidence of a troubled home life.

Those who have substance abuse problems are usually the last ones to realize or admit it. They think they can handle it and feel they are still in control. The process of falling into abuse and addiction is very subtle, and the stages of addiction are incremental. For this reason identification is not always straightforward. The mechanism of denial can also be at work on the part of parents and other adults.

The Role of the School

The school does not own the responsibility for the students' emotional and physical problems. However, when the school is the only constant in the adolescent's life, and when children of all ages bring their problems (e.g., drug and alcohol) to the school environment and to the athletic field, the school has the obligation to address these problems and try to implement change.

The process of identification is often an overlooked step in many schools' programs. This step is the link between prevention and treatment; its importance cannot be overemphasized. Considering the progressive nature of the problem, and the diminishing hope for recovery as addiction progresses, interventions that can possibly prevent further damage are worth the effort.

Successful school programs have been developed using two components: a "core team" which receives formal training, and a referral system for identifying potential substance abusers. With a system such as this, teachers are able to identify students exhibiting problematic behavior through the referral system (usually a confidential form). The core team then follows up with another identification process to determine whether assessment and intervention are needed.

Treatment is not an issue for schools, apart from referral to outside agencies and aftercare to help the student make the transition back to the school from a treatment facility.

Substance Abuse Prevention

Prevention programs offer more hope for reducing adolescent drug use than any other method. The object is to aim at the reduction, delay, or prevention of drug use before it has become habitual or clearly dysfunctional.

Some recommendations for planning prevention programs include:

Use a Broad-Based Approach. Deter drug use by limiting the availability of drugs and enforcing penalties for use, possession, and distribution. Continue to provide information on the effects of drugs coupled with social skills training.

Start Prevention Activities Early. Prevention efforts should begin before youngsters are faced with the decision to use drugs, usually between 12 and 18 years of age.

Help High-Risk Students First. We know from research, experience, and common sense that some kids are at greater risk of becoming drug abusers than others.

Cover All Bases. Prevention efforts should be a continuum of interrelated and complementary activities including those at school, at home, and in the community.

Conclusion

The importance of prevention and early intervention cannot be overemphasized. Substance abuse problems, if left unrecognized, will, in most cases, get worse. One does not have to be trained as a counselor to recognize signs and symptoms. Intuition is a valuable tool. Most people just need an established channel for referral and assessment and a sense of responsibility for reducing drug use among young people.

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Drug and Alcohol Prevention Education

by Liane M. Summerfield

The education summit in February 1990 resulted in the establishment of six national goals for American education (National Goals, 1990). This Digest focuses on Goal 6—Safe, Disciplined, and Drug-Free Schools—which states:

> By the year 2000, every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning.

One objective central to achieving this goal is the development of comprehensive K-12 tobacco, alcohol, and other drug prevention programs within the school health education program. This objective represents a significant acknowledgement of the importance of health education to the total education of the individual.

Tobacco, Alcohol, and Drug Education as a Component of Comprehensive School Health Education

Comprehensive school health education is a planned, sequential curriculum of experiences that promotes development of health knowledge, health-related skills, and positive attitudes toward health and well-being for students in all grades. The curriculum presents information about disease control, personal health, environmental/community health, family life/sex education, consumer health, nutrition, fitness, safety and first aid, mental health, and substance use. In addition, a comprehensive school health education program includes activities that enhance students' communication, decision-making, and responsible self-management skills.

The prevalence of drug use in this country and the potential dangers of using drugs makes tobacco, alcohol, and other drug education an important component of comprehensive school health education. In a recent survey, 19 percent of high school seniors indicated that they had smoked cigarettes and 9 percent had drunk alcohol by sixth grade; half of eighth graders had tried cigarettes and 77 percent reported having used alcohol; and slightly more than half of 12th graders reported at least one experience with illicit drugs (National Commission, 1990). The dangers of HIV transmission from use of injected drugs are well-documented. Therefore, not only should drug education be a component of school health programs, but it should also be infused into other areas of the curriculum.

Community-School Linkages for Drug and Alcohol Education

Comprehensive school health education promotes stronger links between the school and community. To lessen community resistance to sensitive program areas, such as substance use and sex education, and to increase relevance of the curriculum, it is particularly important that program philosophy evolve from the community.

In fact, it is doubtful that schools can play a meaningful role in reducing drug use without parental and community support and involvement. A school-community team might include teachers, parents, students, local businesses, drug and alcohol treatment facilities, law enforcement agencies, and various other community organizations. The team should identify community forces, both positive and negative, that may have an impact on drug use and ensure that program philosophy and approach are appropriate and synchronous with community activities.

Research on the Effectiveness of Drug Prevention Programs

The effectiveness of any component of the school health program can be measured in three ways: (1) gain in student knowledge, (2) change in student attitudes, and (3) adoption of healthier behaviors.

Knowledge is relatively easy to measure and is certainly easier to change than attitudes or behaviors. Drug, tobacco, and alcohol education programs have been found to increase student knowledge (Milgram, 1987). However, a gain in knowledge is not always associated with a corresponding change in attitudes or behaviors.

Most drug education programs have never been evaluated (Goodstadt, 1986). Of those for which some evaluative information is available, the following generalizations can be made:

- instruction is most effective when it begins early in life and is continuous;
- one-shot programs are less successful than those that are part of a multigrade, comprehensive health curricula;

- community support, parent involvement, and peer involvement enhance program success; the teacher plays a critical role, and teacher training is essential.

Implications for Practice

Whereas early drug and alcohol education programs relied heavily on conveying facts or utilized scare tactics, today's programs combine provision of factual information about drugs with promotion of positive self-concept and peer refusal skills. Implementation of a tobacco, alcohol, and drug education program usually involves three steps:

1. **Needs Assessment**

   The program should take into account the problems, culture, and norms of the community, which can only be determined by needs assessment prior to implementing a specific curriculum (Fox, Forbing, & Anderson, 1988). Surveys and interviews are typical information-gathering methods. These may be supplemented with secondary sources of information, such as school absenteeism and dropout rates, drug-related hospital admission data, and arrest rates for drug use and drug-related crimes.

2. **Curriculum Development**

   Central to drug education is provision of age-appropriate information about tobacco, alcohol, and other drugs, symptoms of drug use, factors associated with dependency, and legal aspects of drug use. In addition, and common to all areas of health education, the curriculum should offer activities (such as role playing) for development of peer refusal skills, self-esteem, assertiveness, and problem-solving skills. Curriculum options include purchasing a curriculum (see Resources section), developing the curriculum within each school, or a combination of both.

   Tobacco, drug, and alcohol education also offers many opportunities to infuse content into other curricular areas. Language arts, science, math, social studies, and driver education are among classes in which various aspects of substance use might be incorporated.

   The notion of "curriculum" may be broadened in a comprehensive drug and alcohol prevention program to include treatment referral for those who are substance-dependent and post-treatment aftercare for those returning to school. Some programs have found success with support groups, peer teachers, and peer counselors (Fox et al., 1988).

3. **Program Evaluation**

   Program evaluation is often cursory and conducted as an afterthought. However, since program evaluation assures accountability and may justify expenditures of money and time, a broad approach that examines knowledge, attitudes, and behaviors is appropriate. Some prepackaged curricula include evaluative tools.

Inservice Teacher Education

Inservice education is essential, not just for teaching teachers strategies for drug and alcohol education, but to emphasize how comprehensive school health education fits into the curriculum at every grade level. Considerable evidence exists that teacher training is as important as selecting the "right" curriculum for assuring program success. In addition, support staff should be included in any training program.

In their evaluation of two drug and alcohol education curricula, Tricker and Davis (1988) found that inservice training needs of experienced and inexperienced teachers differed. The inexperienced teachers needed a great deal more information about all aspects of alcohol and drugs. Experienced teachers benefitted more from hands-on time with curriculum materials.

Summary

Substance use is a critical component of the comprehensive school health education program. It is not enough to articulate national goals for tobacco, drug, and alcohol education. School systems, administrators, parents, and the community must use these goals to establish policies and strategies for achieving objectives at the local level.

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College Alcohol and Drug Abuse Prevention Programs: An Update

by Margot Sanders Eddy

It has been almost a decade since the Inter-Association Task Force on Alcohol Issues initiated BACCHUS (Boost Alcohol Consciousness Concerning the Health of University Students), a nationwide college alcohol education program that marked the beginning of broad-based efforts to address alcohol abuse on college and university campuses. In the interim, the college alcohol and drug abuse prevention movement has gained momentum and depth. Spurred in part by urgent federal legislation, programs designed to educate administrators, faculty, and students about alcohol and other drug abuse have taken new directions and dimensions, involving both campus and local communities in the process.

What Is the Impetus for Change?

While the need to address alcohol and other drug abuse on college campuses has been recognized for many years, progress toward that end has accelerated. Current efforts are largely in response to the 1989 Drug-Free Schools and Communities Act Amendments, which required colleges and universities receiving federal funds to adopt and implement a program as of October 1, 1990, for the prevention of alcohol and other drug abuse by students, faculty, and staff.

How Has the Higher Education Community Responded to the Need for Alcohol Education?

The establishment of BACCHUS in 1982 opened the door to cooperative efforts within the higher education community. This was followed by passage of the 1989 Drug-Free Schools and Communities Act and development of the Network of Colleges and Universities Committed to the Elimination of Drug and Alcohol Abuse, a coalition of institutions initiated by the Department of Education's Office of Educational Research and Improvement. The Network, active since 1987 in bringing institutions together to eradicate campus substance abuse, has seen its membership rise rapidly to 1,300 and its program of training, research, and administrative support expand correspondingly.

In addition, the National College Student Organizational Network for Drug and Alcohol Education, sponsored by the Fund for the Improvement of Postsecondary Education, has made substantial efforts to enhance student involvement in substance abuse education and intervention. In 1989, the National College Student Organizational Network produced a kit for campus program development in cooperation with BACCHUS and the National Organization of Student Assistance Programs and Professionals (National College Student Organizational Network, 1989). The kit includes:

- Information about successful BACCHUS programs, including a guide to successful and safe party-giving and assistance in personal values clarification.
- Information useful in implementing campus student assistance programs for prevention and intervention.
- Questionnaires for students, faculty, and staff to use in assessing knowledge, use, and attitudes concerning campus substance abuse policy, programs, and enforcement.
- A set of standards for campus policy, education programs, enforcement, and assessment, for use by student organizations in identifying specific campus needs and developing appropriate programs.
- A list of members of the network's student advisory board, who are available as consultants on program development.

How Have Individual Institutions Responded?

Growth in the active membership of the Network of Colleges and Universities Committed to the Elimination of Drug and Alcohol Abuse is representative of real growth in campus- based program development. Many programs and policies are so new that information about them is still being gathered. As material becomes available, the ERIC Clearinghouse on Higher Education will establish a file within the existing ERIC database dedicated to college alcohol and other drug abuse prevention efforts. The Clearinghouse expects to process about 600 selected descriptions of campus programs from Network member institutions for inclusion in the file. The existing literature, limited as it is, suggests the programs in place vary widely in design, focus, and scope.

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What's Different About These Programs?

Many of the programs established within individual colleges and universities are distinguished by two features: design specific to the institution's circumstances and mission, and links with the immediate community. Programs receiving the Inter-Association Task Force on Alcohol Issues' Distinguished Program Award illustrate the creativity and thorough planning needed for effectiveness. The University of Missouri at Columbia used a metaphoric theme for alcohol and other drug abuse prevention: "Life is a deck of cards; don't get lost in the shuffle."

Shenandoah University, a small institution with limited resources, implemented 25 campus activities including a mock night court in which students, faculty, and staff "arrested" for violation of drug and alcohol regulations were tried by a local judge, in front of court employees, a public defender and police officers. Involving community officials added realism to the simulated proceedings.

At Washington and Jefferson College, trained undergraduate students visited local high schools to talk with their younger peers about two specific issues: misuse of prescription drugs and use of cocaine and steroids.

The substance abuse education program at Eastern Michigan University, planned and implemented primarily by a core group of students, combined campus athletics and community involvement. Several substance-abuse prevention events were held at university athletic gatherings open to the community, and school staff were invited to participate. At all of these institutions, the activities of National Collegiate Drug Awareness Week represented not isolated, short-term efforts but year- round, institution-wide work to prevent alcohol and other drug abuse.

In addition, the Inter-Association Task Force on Alcohol Issues awarded honorable mentions to two institutions. A diverse program planning committee that included balanced representation of students and faculty was one of the features given recognition at East Carolina University, and the University of North Carolina at Wilmington was acknowledged in part for its involvement of faculty in substance abuse prevention efforts.

Other college and university programs are characterized by unique features and community participation. Wright State University's School of Medicine developed a weekend alcohol abuse intervention program of intensive education and counseling for community members that offers local courts an alternative to incarceration for alcohol-related driving offenses. The program uses medical and other university students as intervention participants, enhancing their educational opportunities while meeting the community's needs (Siegal, 1988).

Using information gathered in surveys of local elementary and secondary school children, the law enforcement program at Pittsburg State University in Kansas developed a substance abuse curriculum for fifth and sixth graders and included it in the university's training program for law enforcement personnel. Those personnel then take the curriculum into the schools they serve ("Using Law Enforcement Personnel in Drug Free (School and Community) Education," 1989).

Central Michigan University's alcohol and drug abuse intervention and prevention program is a comprehensive, campus-based effort to coordinate and support a variety of existing campus initiatives. Some of the component programs, such as a local parent group red-ribbon campaign and a designated driver program in cooperation with local bars, extend well into the local community (Rapaport, 1989).

When the State University of New York Institute of Technology at Utica/Rome knew that it was to become a residential institution, it moved to strengthen prohibition of drug use and self-destructive alcohol use, prevent and reduce on-campus abuse, and encourage and support student- generated alternatives. This effort included stimulating prevention and treatment efforts at primary and secondary transfer institutions feeding into the college (Sallett, 1990).

Other distinctive features of college and university programs include mentoring, peer intervention, non-drinking or limited- drinking pledges and contracts, demonstrations of alcohol's effects on motor coordination, support groups for adult children of alcoholics, and games involving student participants.

Whose Responsibility Is College Alcohol Education?

It appears that while national coalitions, networks, and associations are initiating efforts for campus substance abuse education and intervention, the colleges and universities themselves and student organizations within them are following through with situation-specific remedies. The trend is toward developing innovative solutions that serve not only the campus community but also the larger society. As higher education institutions increasingly assume responsibility for promoting healthy behavior, this trend will continue to grow.

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School Security

by Joan Gaustad

A twelve-year-old repeatedly teased by other students brings a gun to school, shoots another child, and kills himself. A knife-wielding intruder mugs a teacher in the men's room. Flying bullets from a neighboring housing project force the evacuation of a high school's playing field. Events such as these disrupt the learning environment schools try to provide, filling students and staff with fear and endangering their lives. Fortunately, a variety of preventive and coping strategies can help beleaguered teachers and administrators both to protect the school facilities and to safeguard the people who use them.

How Can a District Assess Its School Security Needs?

As Peter Blauvelt (1987) states, "A school administrator cannot control unwanted and unacceptable behavior without timely and accurate security data." He details a procedure for data recording, including a sample "Incident Profile Form" on which the exact nature, time and place of the offense, descriptions of the offender and victim, and actions taken by the school are recorded. Robert J. Rubel, director of the National Alliance for Safe Schools (NASS), has developed a "Process Guide" that adapts crime analysis techniques to the school environment). Disciplinary infractions and incidents of crime are documented and coded according to parameters similar to Blauvelt's. The data can then be analyzed "to identify patterns or trends and to develop intervention and prevention strategies," (Smith, 1984). Using these techniques, Duval County Public Schools in Florida identified the noon hour as the time of most thefts. Shortening the lunch period and posting off-limits areas dramatically decreased petty thefts. The American Association of School Administrators (AASA) presents examples of "Model Report Systems" developed by five school districts and gives suggestions for assessment and reporting systems (AASA, 1981).

What Preventive Security Measures Are Effective?

Alarm systems can effectively reduce vandalism and burglaries. Due to the expense of installation and operation, Gamble and his colleagues (1987) emphasize the importance of careful planning to choose a cost-effective system appropriate to the particular school. They suggest that after surveying the equipment available, administrators should consult a qualified engineer with no vested interest before making a decision. Metal detectors are expensive and controversial. In a 1988 New York City pilot program, security guards checked for weapons with hand-held metal detectors. No guns were confiscated in the schools, but approximately 200 weapons were found nearby, apparently dropped by students when they saw the detectors (Harper, 1989). A Detroit program using metal detectors was challenged legally and ultimately abandoned, "partly because of the difficulties in herding students through the gates in time for class" (Stover, 1988). Traditional methods can help protect school property and personnel without a large initial investment. The systematic use of heavy-duty locks, special key-handling procedures, fencing, identification cards, hall passes, and visitor policies is called "target hardening" (Gamble et al., 1987). Blauvelt (1987) gives a number of crime-prevention tips, ranging from inventory procedures to suggesting teachers collect money during the first period if students bring money to school for a special purpose. Supervision is important both in controlling student problems and in preventing intrusions. Schools may assign staff to patrol halls or cafeterias, have parents and community volunteers monitor reception areas, or hire security guards. New York City spends $43 million on a 2,050-member security staff (Stover, 1988). A police liaison program proved highly successful at Rich East High School in Park Forest, Illinois. In addition to providing security, the officers served as a source of expertise for school officials and developed friendly relations with students (Moriarty and Fitzgerald, 1989).

How Can Attitudes and Behavior Be Changed To Make Schools Safer?

First, it is important to establish clear, consistent discipline in the school environment. Greenbaum (1989) states, "High expectations, respect, trust and positive reinforcement of good behavior are found consistently in schools demonstrating good discipline. . . . If, on the other hand, the atmosphere is one of hostility and insensitivity in which students are continually subjected to criticism and failure, serious disciplinary problems and criminal behaviors are likely to erupt." Stover (1988) describes the principal's role in setting the tone of a school, including encouraging cooperation among staff

members, being personally visible, promoting student involvement, and seeing that students and staff with personal problems get help. Raising security consciousness is also important. Blauvelt (1987) suggests discussing security with both students and staff and involving the entire school community in identifying security problems and formulating plans to cope with them. Emergency drills can prepare both students and staff to react to a crisis (Harper, 1989). Cooperation between school and community is important. "You need a multifaceted, comprehensive approach that involves students, teachers, administrators, parents, community leaders, and the police and courts," says Ronald Stephens of NASS (Stover, 1988). Reaching out to students with violent tendencies and teaching them basic social skills is a promising preventive measure. A twenty-two-year research project at the University of Illinois at Chicago showed that eight-year-olds who displayed aggressive, antisocial behaviors were much more likely to commit crimes as adults, and transmitted their own aggressive tendencies to their children (Greenbaum, 1989). Evidence suggests that educators can help break this vicious cycle. For example, an antibullying campaign initiated in 1983 in Norway reduced bullying and victim problems by 50 percent in two years. Teachers may not be equipped to teach conflict resolution or to deal with violent youths. As William Wayson states, "There are tricks of the trade that teachers don't learn. They don't look into the eyes of students to see if they're on drugs or angry, so they move in too close and violate personal space" (Stover, 1988). Special training can help give teachers the tools they need. Greenbaum (1989) recommends techniques for discouraging aggressive behavior, teaching appropriate skills instead, and coping with violence when it occurs. Walter Doyle reviews classroom management techniques and Edmund Emmer and Amy Aussiker survey the effectiveness of four classroom discipline programs (Moles, 1989).

What if Preventive Measures Fail?

Despite careful efforts, acts of violence will occur. Most authors agree that all students should have intercom systems. Each school should have a written crisis plan assigning staff members specific roles in case of emergency. School officials should have plans for communicating with "students, parents, staff, law enforcement personnel, emergency medical services, the media and hospitals" (Harper, 1989). Clumsy handling of the aftermath of a crisis may cause additional trauma to victims. Feder (1989), reporting on assaulted New York City school staff members, noted that while emotionally vulnerable and often injured, victims were typically shuffled from room to room, given lengthy forms to fill out, and given little emotional support. Later, fellow staff often treated victims insensitively, unconsciously denying that violence could happen to them. Administrators should educate themselves and staff about victims' emotional needs before an assault occurs. An entire community may need therapeutic care after a crisis such as the shooting at Cleveland Elementary School in Stockton, California. School systems should determine what mental health resources are available in case of such an event. The NSSC recommends that schools be kept open for counseling and information for several days after a traumatic event, and that counseling services be made available for months, to school staff and administrators as well as to parents and children (Harper, 1989).

What Is the School District's Legal Responsibility?

Henry Lufler suggests that during the "Litigation Explosion" of the 1970s, pessimistic expectations about court intervention "may have caused school personnel to become overly cautious when dealing with discipline . . . issues." In reality, threats outnumbered actual lawsuits, and the initial filing of unusual suits was more widely publicized than their generally unsuccessful final outcomes (Moles, 1989). A number of court cases in the 1980s produced rulings that stressed schools' responsibility for students' safety. Schools are expected to provide a physical environment that suits the purposes of an intellectual institution. Administrators who examine their security systems and take conscientious steps to safeguard students and staff may not be able to prevent all crime, but they can protect their schools from liability in court (Harper, 1989).

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UNITED STATES DEPARTMENT OF EDUCATION

OFFICE OF THE ASSISTANT SECRETARY
FOR EDUCATIONAL RESEARCH AND IMPROVEMENT

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RMS

Bob Stonehill

Enclosures

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