Bringing the Potential of Underserved Children to the Threshold of Talent Development

by

Laurence J. Coleman

and

W. Thomas Southern

Accelerating Achievement in Math and Science in Urban Schools (AAMSUS) is a research and demonstration grant funded under the Javits Education for Gifted and Talented Program. The program rationale, intervention, and description of efforts to this point are described below.

Rationale for AAMSUS

Gifted children benefit from special educational programming. Among the gifted are children with potential who are economically disadvantaged, limited English proficient, and disabled. All are underserved. Many explanations, from test bias to inadequate training of personnel, have been offered. A strong consensus exists that this is a problem that lies outside the child, implying that the identification system is the problem (Coleman & Cross, 2001; Ford, Harris, Tyson, & Trotman, 2002). The conventional wisdom is that identification plus programming equals achievement for economically disadvantaged youth, with the emphasis on identification.

Efforts to produce validated nontraditional measures that reflect academic readiness for programs of rigor and predict academic success in such settings has been generally unsuccessful (National Research Council, 2002). The long-standing emphasis on finding measures to identify economically disadvantaged students is understandable but misplaced. Alternate identification measures and the expectations accruing from them often result in underreferral. But, more importantly, the expectations of teachers and program administrators for nontraditionally identified students result in the belief that these students cannot compete with students identified through traditional means. It leads to the proposition that these students will require extensive and pervasive remedial efforts to allow them to integrate into gifted programs with traditionally identified students.

The resolution of the problem of serving economically disadvantaged students lies more outside the identification system and inside the academic programs used

to promote achievement. Accelerating Achievement in Math and Science in Urban Schools (AAMSUS) places the emphasis on programming. The challenge is to bring the potential of economically disadvantaged children to the threshold of high achievement and in that sense validate identification (both traditional and nontraditional) and educational programs. Economically disadvantaged children need to be prepared to handle the academic assessment activities and challenging learning opportunities that are typical in the lives of educationally advantaged students. Economically disadvantaged children should experience success in those situations so they know they can achieve in math and science on their own. Identification is important, but academic opportunities are the heart of this research study.

The low general achievement level of our students is a concern, and AAMSUS focuses on math and science. Children in urban schools with high-minority, economically disadvantaged enrollment persistently perform below the national average in math and science. For example, performance indicators from the National Assessment of Educational Progress show an increase in math proficiency through the 1990s with decline near 2000. In fourth and eighth grades, students scored 26% and 27% above the Proficient level for each grade. Students in high-poverty public schools did less well and scored lower than students in low-poverty public schools (National Center for Educational Statistics, 2003).

The causes of low student performance in elementary and secondary schools are shaped by many factors in the school environment. These factors include the "courses offered in the school and taken by students, the instructional methods used by teachers, the options for learning available to students with special needs, and the climate for learning and discipline in the schools" (National Center for Educational Statistics, 2003, p. vii). Our approach addresses these factors, as well three others. The first is that the out-of-school environment is unsupportive of academic achievement (Ford et al., 2002). Being academically successful is not valued by peers and may be seen as a betrayal of one's roots (Rowley & Moore, 2002). These pernicious attitudes persist through elementary school. Once middle and high school is reached, it is almost too late for a student to make a personal choice to include "math learner" or "science achiever" as a part of his or her evolving sense of identity. The loss of potential talent becomes obvious in postsecondary enrollment (Alamprese, Erlanger, & Bringman, 1988).

The challenge is to bring the potential of economically disadvantaged children to the threshold of high achievement ...

The second factor is that the emphasis on raising achievement scores appears to have increased the amount of drill and practice in classrooms, a form of teaching that is particularly bothersome to learners with high potential (Stewart, 1981). Paradoxically, the drill approach not only works contrary to the educational methods students with potential prefer, but also puts them in situations that negates the goal of promoting achievement. Asking children with high potential to learn again and again what they already know is like asking a child to stay behind. Spending longer amounts of time practicing what they know decreases the time they could be taught at their most appropriate level, which decreases their chances for accelerated achievement (Southern, Jones, & Stanley, 1993).

The third factor is that disadvantaged students have limited access to up-to-date materials. The consequences of an "old" and "dumbed down" curriculum mean a loss of contact with challenging current materials. Academic growth and high achievement demand children have experiences in challenging curriculum. The feeling of academic efficacy that economically disadvantaged students need is not realized in the school because meaningful academic challenge is not presented. Rarely can economically disadvantaged students with potential experience feelings of pride at having met high standards that others have reached. Children and families who have withstood these forces, like the Mayerhoff Scholars, tell stories of how difficult it was to find accelerative experiences that can lead to high achievement (Hrabowski, Maton, Green, & Greif, 2002).

The long-term consequence for disadvantaged children with high potential for achievement is not posi-

tive. Any enthusiasm a young child might have is limited by school and by community. Instead of moving ahead, they learn less than they are capable, thus becoming educationally malnourished. AAMSUS is designed to change the academic opportunities available by reducing the environmental impediments and inserting learning opportunities to increase achievement in science and math that are typical for educationally advantaged children.

Educational Approaches for Gifted Children

Educational services directed at gifted children fall into three broad categories: enrichment, acceleration, and grouping. *Differentiation* has become the term encompassing the three categories. Enrichment is the most often used intervention, and acceleration is used relatively less frequently, yet the latter has been shown to be a more powerful intervention (Coleman & Cross, 2001; Rogers, 1991).

Acceleration has been shown to be a highly effective strategy for meeting the needs of gifted students. Meta-analyses (Kulik & Kulik, 1984; Rogers, 1991) illustrate that early admission and grade acceleration provide positive academic advantages for gifted students. Rimm (1986) provides evidence that accelerative interventions assist in addressing underachievement among gifted students. The use of acceleration for students in summer programs and extracurricular programs, like Saturday seminars, is well documented (Benbow & Stanley, 1983). Accelerative options are efficacious for academic achievements (Southern et al., 1993) because acceleration has the advantage of being tied to state standards that are integrated into the curriculum directly. Acceleration allows students to spend increased time learning new content without merely engaging in drill and recitation, and allows the integration of academically relevant enriching experiences that are linked directly to mastery of the content. Until now, these programs have been availed by students from advantaged backgrounds who already have had generally enriched and accelerated backgrounds that prepare them for advanced experiences. Project AAMSUS provides learning opportunities to enable less-advantaged children to prepare for and to participate in these advanced classes in secondary school.

AAMSUS is built on the notions of finding economically disadvantaged children early, providing varying interventions, raising achievement, and having the intent of producing long-range effects in high school and postsecondary schooling. We believe that an accelerative oriented approach will raise achievement and increase entry into advanced academic courses. The project capitalizes on the strong evidence of the relationship between acceleration and the development of talent (Southern & Jones, 1991), on the literature on talent development demonstrating that long-term commitment and participation in a domain is an essential component of advanced development (Bloom, 1985; Ericcson, 1996; Feldman, 1994), and on the evidence of insufficient opportunity in urban schools (Council of the Great City Schools, 2003). In essence, AAMSUS' plan is to find children with potential early, assess their specific strengths in the curricular areas of math and science, provide them enriched and accelerative experiences (i.e., in-class, Saturdays, summer residential) based on appropriate curriculum-based assessment, and create a support network (i.e., trained professionals, a cohort, and mentors) over a 5-year time period so that their academic talent can flourish.

Implementing AAMSUS

The project began in 2004. The plan was to offer parallel educational programs in the two urban settings. Two hundred children were to be identified in fourth grade in order to receive the intervention for the next 5 years. Two Ohio cities, Toledo and Dayton, were the sites of the program. Each city faces many of the challenges of urban industrial centers. The industrial base has diminished, the middle-class population has moved outside the city, unemployment and underemployment are facts of community life, and the academic performance of the schools is not what it once was. Scores reported by the state department of education demonstrate that the gap in achievement between advantaged and disadvantaged communities is evident.

The project seeks economically disadvantaged students with potential in math and science in order to increase their achievement and their positive regard for those curricular areas. The intent was to select 100 children in each district who would not ordinarily be served in programs for the gifted who had teachers who would participate in accord with the program aims. Teachers were trained to identify children of potential in math and science. Children were nominated on the basis of standardized tests, curriculum-based assessment in the form of state-developed accountability assessments and teacher recommendation. Three groups of children were selected: those who had scores that would have admitted them into the district's gifted program and

had high advanced proficient ratings in math and/or science, children who reached proficient ratings and teacher recommendations, and children who the teacher believed had a "spark" that the teachers interpreted as signs of potential talent.

Parents or guardians of children who were invited into the project were contacted for their permission. The parents were provided information on the program and specific time commitment in terms of Saturday seminars and a 2-week residential summer program at the universities. The teachers who were involved in nominating children were active agents in communicating with the parents. In many cases, numerous contacts were initiated. Town meetings were held for parents to explain the program and to answer their concerns. Parents were worried about their children being on a college campus away from home for 2 weeks in the summer. Stories of campus life concerned the parents because few had been to college. Despite the concerns, however, most parents allowed their children to attend, 82 from the Dayton site and 100 from Toledo.

The intent of the program is to use accelerative and enrichment strategies to increase achievement and to change attitudes and interest in science and math. In Year 1, the intent was to promote the idea that science and math is present in interesting and intriguing ways in our environment and to establish baseline data. The Saturday and summer classes were organized to meet those goals. Our intent was to get children to appreciate the opportunities we could provide and to begin to build a cohort. In the subsequent 4 years, more accelerative options will be implemented, as well as opportunities to prepare for high-stakes tests.

What Has Been Implemented to Date?

Dealing with two different urban school systems presented challenges. Each system has its own way of doing business. Each had established procedures and lines of authority, as well as having established constituencies in teacher and principal organizations. All of the parties supported the AAMSUS project, but attention to other school district problems and obligations took time to work out the many details. Preliminary arrangements continued until early winter.

Children were selected in the winter (100 in Toledo and 88 in Dayton). Children were transported on Saturdays from their local schools to the program. While the program adhered to the parameters of the research plan, the Saturday enrichment curriculum varied according to constraints in each school system. Distance between each school system and the two universities, The University of Toledo and Miami University, influenced program arrangements. The University of Toledo was located in the school district, while the Dayton program was separated from the Miami University campus by 50 miles. In terms of curriculum, Toledo focused more on integrated educational experiences connected to the environment located at the university; Dayton provided experiences in science centers located throughout the area. Both were successful in building enthusiasm for learning and the desire to be in the summer program.

The summer program followed the basic project plan, which was modified by constraints in the local situation, too. A residential program was offered on the University of Toledo and Miami University campuses for 10 days. Students lived in typical dormitories, ate typical food, and took advantage of the classroom and lab facilities. Toledo's program was held on consecutive days, and Dayton was held on 10 days separated by a weekend. The curriculum was high-interest science and math courses. Toledo continued with its integrated curriculum taught by the children's teachers; Dayton had courses taught by teachers and university faculty. Residence counselors were teachers and college students. The students were awed by "going to college."

Results

Because our intent was to establish baseline data, we do not report scores. Data were gathered on third-grade preproficiency and fourth-grade proficiency tests, the Test of Critical Thinking, curriculum-based assessments in math, and a science attitudes test. The range of scores was much broader than we anticipated, even with this selected group. The variation is indicative of the educational challenges presented by children who have had limited educational opportunities and illustrates the scope of the problem. To a certain extent, it also reflects the variety of school settings and variations of students selected by different teachers in different school settings. While many of the students showed strong evidence of academic achievement on normed measures, others did not. Those selected by nontraditional means, while frequently performing well in hands-on activities and displaying well-developed math or science reasoning, had some instructional deficits. Test performances also seem to be affected by lower reading abilities in some students.

In addition to standardized data, anecdotal data were collected. Teachers reported that the students acted dif-

ferently at their schools. Behavior improved. Homework was finished more promptly. Conversations about curriculum content, which were rarely heard before the program, were common. Excitement about the forthcoming program increased as Saturday approached. At the program at the university, the children's teachers from their home school reported that their children were more engaged, more independent in learning, asked more questions, and were more patient with other children. In some instances, the program served to reinforce positive behaviors and reduce problem behaviors in the schools. Students seemed not to want to jeopardize their continuing participation by misbehaving in school. Behavior in the Saturday and summer programs was similarly positive. Very few instances of problem behaviors that required intervention were noted. Project staff made unsolicited reports of how well behaved and how capable the students were.

Conclusion

Implementing a program to move children to the threshold of talent development is a complex undertaking. Accelerating Achievement in Math and Science in Urban Schools identifies children with early potential, measures their strengths in math and science curriculum, makes available enriched and accelerative experiences (in-class, Saturdays, summer residential) based on appropriate curriculum-based assessment, and builds a support network (trained professionals, a cohort, and mentors). Over the next 5 years, we hope to demonstrate that academic talent can flourish under the conditions AAMSUS creates. GCT

References

Alamprese, J. A., Erlanger, W. J., & Bringman, N. (1988). *No gift wasted: Effective strategies for educating highly able disadvantaged students in math and science* (Vols. 1–2). Washington, DC: Cosmos Corporation.

Bloom, B. S. (Ed.). (1985). *Developing talent in young people*. New York: Ballantine Books.

Benbow, C., & Stanley, J. (1983). *Academic precocity: Aspects of its development*. Baltimore: Johns Hopkins University Press.

Coleman, L. J., & Cross, T. C. (2001). *Being gifted in school: An introduction to development, guidance, and teaching.* Waco, TX: Prufrock Press.

Council of the Great City Schools (2003). *Beating the odds III: A city-by-city analysis of student performance and achievement gaps on state assessments*. Washington, DC: Author.

Ericcson, K. A. (Ed.). (1996). *The road to excellence: The acquisition of expert performance in the arts, sciences, sports and games*. Mahwah, NJ: Lawrence Erlbaum Associates

Feldman, D. H. (1994). *Beyond universals in cognitive development.* Norwood, NJ: Ablex.

Ford, D. Y., Harris, J. J., III, Tyson, C. A., & Trotman, M. F. (2002). Beyond deficit thinking: Providing access for gifted African American students. *Roeper Review, 24*, 52–58.

Hrabowski, F. A., Maton, K. I., Green, M. L., & Greif, G. L. (2002). *Overcoming the odds: Raising academically successful African American young women.* London: Oxford University Press.

Kulik, J., & Kulik, C. (1984). Effects of accelerated instruction of students. *Review of Educational Research, 54*, 409–425.

National Research Council. (2002). *Minority children in gifted and special education*. Washington, DC: National Academy Press.

National Center for Educational Statistics. (2003). *The Commissioners statement: The condition of education*. Washington, DC: Author.

Rimm, S. (1986) *Underachievement syndrome: Causes and cures*. Waterton, WI: Apple.

Rogers, K. B. (1991). A best evidence synthesis research on accelerative options for gifted students. In N. Colangelo, S. G. Assouline, & D. L. Ambrose (Eds.), *Talent development: The proceedings from the 1991 Henry B. and Jocelyn Wallace National Research Symposium on Talent Development* (pp. 406–409). Unionville, NY: Trillium Press.

Rowley, S. J., & Moore, J. A. (2002). Racial identity in context for the gifted African American student. *Roeper Review, 24*, 63–68.

Southern, W. T., & Jones, E. D. (1991). Acceleration and enrichment: Echoes of the debate. In W. T. Southern & E. D. Jones (Eds.), *The academic acceleration of gifted students* (pp. 223–228). New York: Teachers College Press.

Southern, W. T., Jones, E. D., & Stanley, J. (1993). Acceleration and enrichment: The context and development of program options. In K. A. Heller, F. J. Mönks, & A. H. Passow (Eds.), *International handbook of research and development of giftedness and talent* (pp. 387–410). Oxford, England: Pergamon Press

Stewart, E. (1981). Learning styles among gifted/talented students: Instructional preferences. *Exceptional Children*, 48, 134–138.