

RECOMMENDATIONS FROM CONFERENCE PARTICIPANTS

In order to better understand effective strategies to increase the success of women, minorities, and members of other groups who have been underrepresented in science, mathematics, and technology, the Virginia Mathematics and Science Coalition convened a statewide conference, "Programs That Work," in Chester, Virginia on March 23-24, 2000. Eleven exemplary programs were highlighted at the conference. Over 100 individuals participated, including: leaders of the exemplary programs, K-12 and college faculty and administrators, scientists, corporate representatives, public sector leaders, and members of the Virginia Mathematics and Science Coalition.

The participants developed the following recommendations for the Virginia Mathematics and Science Coalition and for interested Virginia communities.

I. Teacher Preparation

Well-prepared teachers are a key factor in increasing the numbers of minority members and women in the technological workforce. As is the case nationwide, Virginia is beginning to experience a shortage of teachers. This shortage exists in most regions of the state, at most grade levels, and in most subject matter areas. The need is particularly great in urban and rural school systems, and in the subject areas of mathematics and science.

Virginia must produce more teachers who are well prepared in their subject areas and who possess an understanding of how students learn. Minorities and women can help Virginia meet these critical needs. In turn, these teachers can be particularly effective in recruiting future generations of women and minorities to all technological fields.

Future teacher recruitment: Future Teacher Associations are effective recruiting tools and should be organized for students at all grade levels. Enrichment programs, such as those similar to "Programs That Work," should incorporate a component that encourages students to consider teaching as a career. Another population to consider would be college freshmen who have not yet finalized their career plans. Finally, programs that give students the opportunity to become involved with schools are a particularly effective recruitment tool.

Teacher preparation: Disciplinary faculty in mathematics, science, and technology must be assigned a meaningful role in the development of and participation in teacher preparation programs. It is crucial that these faculty offer high quality courses that “model” the type of instruction all teachers should provide, including diversity and special needs issues.

Financial incentives: In order to attract the best teachers who can provide high quality practicum and student teaching experiences, adequate compensation must be provided. In addition, attention must be paid to the high cost of education; those in teacher preparation programs in such high-need areas as mathematics and science should be considered for “forgivable loans”; i.e., loans which may be forgiven if the teacher fulfills the requirement of teaching a set number of years.

II. Professional Development and Instruction

School systems and the broader community need to provide teachers with much more complete support through their careers. Teachers teach most effectively if they: are given current classroom facilities and equipment; possess the on-going ability to update their skills and knowledge with the financial blessings of the school system; and, have access to professional development models with proven educational research that can be put into practice.

Support for Beginning Teachers: Strong mentoring programs providing support from outstanding veteran teachers are needed in all schools. Experienced teachers who have opted for early retirement are particularly good candidates for mentors. Apprenticeship programs that provide for gradual immersion into the profession have proven to be effective. It is recognized that such programs are very expensive; however in the long run, they are cheaper than placing individuals who have not completed full teacher preparation programs directly into the classroom in an unsupported manner.

School system support: Continuing teachers should be provided with good classroom and laboratory facilities equipped with up-to-date technology. Having this technology in place, it is especially important that teachers be allocated adequate planning time for collaboration, and development of interdisciplinary and enriching active-learning strategies.

Professional development: All teachers need to be provided with continuing professional development opportunities and incentives for participation, including merit increases, stipends, and extended contracts.

Development models: Teachers need professional development models to assist them in implementing documented educational research in areas such as, gender and ethnic equity, content and process instruction, curricula analysis and assessment, and processes through which students learn.

III. Special Programs

Well prepared teachers working in a school that is committed to providing a quality education for all students is a necessary condition to increasing the success of women, minorities and others. However, this is not sufficient. Students need advocates, mentors, and programs that provide enrichment and encouragement beyond what school can provide. The conference participants were impressed with the effectiveness of special programs, including the “Projects That Work” that were recognized at the Coalition conference, designed particularly for women, minorities, and other individuals who have not traditionally been heavily represented in the sciences and technological areas.

Partnerships: Many resources in the community are available and need to be marshaled. Various partners such as museums, government offices, communities, churches, and colleges are making important contributions in this area and their work needs to be recognized.

Technology: Programs are particularly needed to help reduce the “digital divide” found in many disadvantaged and minority households. Computer loan/donation programs from corporations are one possibility.

Resources: Mechanisms need to be established to enable individual classroom teachers to learn about what is available for students in their classrooms.

IV. Role of the Family

The role of the family in nurturing student success cannot be underestimated. The important ingredient is the interest, support, and encouragement of the child's family. While family members who have been successful in academic endeavors, particularly in mathematics and science, can serve as strong role models, those with only limited education can also make important contributions to a child's success. For example:

Learning By Example: It is important that children see that their parents and other family members care about education. Family members who are in the process of earning a GED diploma or returning to school can make a huge impact by doing their homework while the child is doing his or her homework.

Home Enrichment: Parents can create a climate of learning by creating a home learning center, by mounting displays of children's work, by asking the child what he or she is learning at school.

Contribution of Parents to Schools: Family members, including those with very little formal education, can make contributions to their schools. Schools can make an important contribution to their student's success by recruiting parents, particularly parents with little formal education, to assist. For example, as a first step, parents could be asked to collect items such as egg crates, lids, paper rolls, buttons, and fabric scraps that can be used in the classroom. Then these parents can be encouraged to come to school and help with individual students, perhaps as reading partners. They can also be recruited to put together science experiments before the class to help the teacher. Parents can provide childcare so that another parent can volunteer in the classroom.

V. Role of the Coalition

The Virginia Mathematics and Science Coalition has the potential to have a major impact on the success of women and minorities in mathematics, sciences, and technology.

Partnerships: The Coalition should develop its capacity to foster partnerships with religious and community groups, and organizations of influence for the purpose of encouraging and supporting mathematics and science education.

Business Community: The Coalition should work to actively involve the business community in helping to bridge the digital divide and in articulating the need for well prepared students in mathematics, science, and technology areas.

Refinement of Standards of Learning: The Coalition should continuously remind the public that the Virginia Standards of Learning tests, when carefully constructed and refined, can serve to help increase student learning and success. This increase in student success is the only justification for the standards and is the reason that the nature of the questions on the examination are of critical importance.

Financial Support: The Coalition should strongly recommend to the General Assembly that financial support for mathematics and science specialties at the elementary and middle school levels are a high priority. In addition, it should advocate the provision of forgivable loans to prospective teachers, particularly to those in areas of high need such as science, mathematics, and technology.

Recognition: The Coalition should continue to recognize “Projects That Work” to encourage the individual, personalized, caring approaches that can make the difference in individual lives. ■