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ABSTRACT

The Richmond Area Young Scholars program, designed for a target population of rising seventh grade black students in the Richmond, Virginia area, emphasizes mathematics and physics. Honors topics instruction will be provided by faculty of the Virginia Commonwealth University (VCU) and by pre-college faculty who are members of the Mathematics Teacher Professional Network. The program aims to nurture student interest in mathematics and physics, establish small group interactions with industry and academic researchers, and develop student research projects. The program includes formal mathematics and physics instruction, team research projects, activities in a space education training facility, and field trips. Selected students participate in a 3-week program, for 2 successive years, consisting of 12 day institutes on the VCU campus during the summer and 6 Saturday morning activities. Academic year follow-up activities include regular mentor contact and group activities through the Richmond Area Mathematics and Science Center. (JDD)

RICHMOND AREA YOUNG SCHOLARS PROGRAM

Department of Mathematical Sciences
Virginia Commonwealth University

National Science Foundation Grant #RCD-8955641

Starting Date: July 2, 1990

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AASCU/ERIC Model Programs Inventory Project

The AASCU/ERIC Model Programs Inventory is a two-year project seeking to establish and test a model system for collecting and disseminating information on model programs at AASCU-member institutions--375 of the public four-year colleges and universities in the United States.

The four objectives of the project are:

- To increase the information on model programs available to all institutions through the ERIC system
- To encourage the use of the ERIC system by AASCU institutions
- To improve AASCU's ability to know about, and share information on, activities at member institutions, and
- To test a model for collaboration with ERIC that other national organizations might adopt.

The AASCU/ERIC Model Programs Inventory Project is funded with a grant from the Fund for the Improvement of Postsecondary Education to the American Association of State Colleges and Universities, in collaboration with the ERIC Clearinghouse on Higher Education at The George Washington University.

ABSTRACT

The Richmond Area Young Scholars program emphasizes mathematics and physics and is designed for rising 7th grade Black students in the Richmond area. Honors topics instruction will be provided by university faculty and by pre-college faculty who are members of the active Mathematics Teacher Professional Network. Student interest in mathematics and physics will be nurtured, students will report on small group interactions with industry and academic researchers, and students will conduct and report on small scale research projects. Academic year follow-up activities include regular mentor contact and group activities through the Richmond Area Mathematics and Science Center.

Richmond Area Young Scholars Program

Dr. Reuben Farley and Dr. P.N. Raychowdhury in the Department of Mathematical Sciences at Virginia Commonwealth University have been awarded a National Science Foundation (NSF) grant for a two year "Richmond Area Young Scholars Program." Thirty Black students in the Richmond area who entered seventh grade in the Fall of 1990 and who have demonstrated interest and potential in mathematics and science were selected as NSF/VCU Young Scholars. The goal of the project is to nurture the interest of these students and provide them with appropriate information and encouragement so that a large percentage will prepare for careers in mathematics and science.

The students participate in a three week program for two successive years consisting of twelve day institutes on the VCU campus during the Summer of 1990 and the Summer of 1991 and in six Saturday morning activities during each of the subsequent years which involve activities in the Challenger Center, a state-of-the-art space education training facility at the Mathematics and Science Center, and field trips to such sites as the Virginia Science Museum, Langley Research Center and the Chesapeake Bay. During the course of the program, each Young Scholar will learn some interesting mathematics and physics which is not part of the standard curriculum, will have individual contact with university mathematicians and physicists as well as with mathematicians and physicists practicing in industry, will participate in designing and carrying out scientific experiments, and will learn what steps he or she needs to take to become a mathematician or physicist. In addition, each Young Scholar will develop and one-on-one relationship will an individually selected mentor who is a teacher, a student, a university faculty member, or a practicing physicist or mathematician.

Local secondary and middle school teachers, who serve as "Clinical Faculty" in cooperative, collegial endeavors with VCU mathematics and mathematics education faculty in the Richmond Area Mathematics Teacher Professional Network, join with VCU professors and teachers from the Mathematics and Science Center in instructing the program. The Richmond Area Teacher Professional Network has been recognized nationally as one of 20 mentor projects in the American Mathematics Project.

The formal mathematics instruction features cooperative learning through group logic puzzles, the development of deductive and inductive reasoning skills using puzzles and computers, and statistical concepts. The formal physics instruction features student interaction with two robots, Hero 1 and Hero 2000, which are equipped with sonar, a motion sensor, a light sensor, and a voice synthesizer. The robots are used to study ideas and concepts including remote computer control, motion, light, sound and motion detection, leverage, speed, inertia, and force.

Young Scholars also work in teams of five, assisted by one secondary or middle school teacher and one college student, on group research projects. These projects focus on statistics and are modeled after projects developed in the Quantitative Literacy Program. With the support of the advisors, the group is responsible for design of the experiment, for consideration of ethical questions, for carrying out the experiment, and for preparing written and oral reports.

Each summer, career exploration activities are emphasized each day. Students receive basic information concerning secondary school course work options, summer intern opportunities for secondary school students, higher education opportunities and costs, and options for financial aid. A special feature is "Industrial Mathematician and Scientist Day"

during which groups of four or five students, accompanied by project staff, spend the day with a practicing physicist or mathematician. The scientist shows the students his or her working environment and describes the nature of his or her work. Prior to this special day, the group developed a structured interview instrument to solicit specific information from the scientist in such areas as required education, the career path followed, career satisfaction, and job frustration. This past summer, groups of five Young Scholars visited NASA Langley Research Center, U.S. Naval Surface Weapons Center, North Anna Nuclear Power Plant, Phillip Morris Inc., Allied Signal, Inc., and Virginia Department of Transportation.

A "University Researchers Day" features activities paralleling those for "Industry Day". Groups of scholars and a staff member spend the day with a university-based researcher engaging in formal interviews and informal discussions. This past summer, in groups of five, Young Scholars visited VCU researchers in biology, chemistry, physics, statistics, medical applications of statistics, and medical applications of computer science.

Following the format for the other two special days, a "University Day" will introduce the Young Scholars to universities around the state including Hampton University, University of Virginia, VCU, VPI, Virginia State, and Virginia Union. Visiting groups of students will meet with admissions officers, financial aid advisors, academic deans, college students, and faculty members. Emphasis will be on possible academic majors and career options, on appropriate secondary school work, on admissions standards, and on financial aid.

Participant recruitment was coordinated by Dr. Jacquelyn Joyner, Secondary and Middle Mathematics Supervisor for Richmond City Schools. Participants receive free hot

lunches, a transportation allowance, a $20 stipend, and a calculator. Participants are invited to bring their parents to a banquet each summer where program activities are highlighted and continuing contacts will be strengthened.

The past summer's program was very exciting. The students were great! They were excited, willing to work, and very bright. Media coverage was superb, ranging from local newspaper stories, to TV shots on the evening news, to intensive coverage in University publications. Mr. James Dyke, Secretary of Education for the Commonwealth of Virginia, also visited the Young Scholars program and engaged each student individually in career discussions. We look forward to academic year mentorship and follow-up activities and eagerly await the return of our 30 Young Scholars for next summer's program.