

CHROME: A SUCCESSFUL COLLABORATION THAT WORKS

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Math and science achievement scores for students in the U.S. have not changed much over the past two decades. In international science and math achievement comparisons of 13-year-olds from five countries, the U.S. lagged behind the highest achieving nations.

The pipeline is a model of the process that refines abundant crude talent into select finished products as signified by the award of baccalaureate, master's and doctorate degrees. For example, of the four million students in the 10th grade in 1977, 18% of this class was interested in natural science and engineering, 15% of the individuals were interested as high school seniors, 9% as college freshmen, and only 1.5% of this class was awarded bachelor's degrees in natural science and engineering. By the year 2000, 35% of new entrants into the labor force will be white women, and 34% will be other male and female and minorities. Compounding this is that these groups continue to be significantly underrepresented among the ranks of the Nation's scientists and engineers in proportion to their numbers in the overall U.S. Work force. White women account for 16% of all employed scientists and engineers, although they are 45% of the U.S. population of 12% and 8% respectively.

Additionally, the traditional pool of engineering students which is overwhelming white males, is diminishing; they are selecting more majors in business and law. White males account for less than 75% of all bachelor's degrees in natural sciences and engineering and just over 60% of the degrees in science and engineering in general.

The Solution

- Tap the talents of ALL youth, with a particular emphasis on those underrepresented in the fields of math, science, engineering and technology.
- Implement pre-college programs that are different from, but complimentary to the education currently offered to students by school systems.

IMPACTING CHANGE THROUGH COLLABORATION

1997 WEPAN/NAMEPA CONFERENCE

Cooperating Hampton Roads Organizations for Minorities in Engineering (CHROME), founded in 1983, is a non-profit consortium of public school systems, colleges and universities, business and industry, governmental agencies and professional associations in Hampton Roads, Virginia. Funded by annual membership contributions, Old Dominion University, and grants, CHROME serves the greater Hampton Roads area as a planning, coordinating, and advocacy organization designed to complement and improve the educational programs of school systems. In 1994 CHROME received the Governor's Community Award for the best community-wide educational partnership in Virginia and was recognized nationally by the Coalition on Educational Initiatives in *USA Today* three successive years since 1993.

Partners need to spend time doing "Strategic Thinking"

In August, 1996 CHROME's partners under the leadership of Barry Marten of Siemen's Automotive and Teresa Beatty of Thomas Jefferson National Accelerator Lab, Chairman and Co-Chairperson respectively, held a two day retreat with staff and developed the following vision, mission and goals which were later augmented with tentative objectives, (asterisked items).

VISION

CHROME'S vision is to be recognized as the leading organization promoting student access to, and achievement in, science, mathematics, engineering and related technical fields to meet future global requirements.

MISSION

The mission of CHROME is to increase opportunities for underrepresented minority and female students to enter science, mathematics, engineering and related technical fields.

GOALS

1. To identify, nurture and assist these students to pursue careers in engineering, science, mathematics and related technical fields;

- * Maintain support of existing club programs in conjunction with school system liaisons to:
 - Improve participation and programming of existing clubs,
 - Pursue expansion of pre-college school and community clubs where administrative and staff support are invited and identified.

(Quite a bit of discussion was held on expansion and the committee recommended forming an Ad Hoc Committee to investigate this further. There is apparently no

procedure for adding new clubs. The Ad Hoc Committee will make recommendations to the Executive Committee).

- * Work with universities and other partners to provide enhancement activities on Saturdays and school vacation periods;
- * Strengthen alumni network to provide additional motivation and support for students and teachers;
- * Encourage further linkages between elementary, middle and high school clubs.
- * Expand efforts to support students pursuit of continuous education through graduate school by providing workshops, counseling sessions by serving as a clearing house for scholarship opportunities.

2. To provide training activities, programs and resources designed for teachers, counselors, and parents to encourage these students to pursue careers in engineering, science, mathematics and related technical fields;

(Committee recommended that training be tied into recertification process. Establish and encourage training opportunities for all sponsors, especially when clubs change from one sponsor to another).

- * Provide more direct approach where regional coordinator is available - individual sessions and follow-up with teacher teams at their schools;
- * Disseminate potential workshops developed and implemented by CHROME staff including multi-cultural awareness, preferred learning styles of minorities and females; and overcoming barriers to mathematics and science achievement;
- * Establishment of a parental advisory committee;
- * More opportunities 'direct-mailed' to homes to increase parental involvement;
- * Parental participation and involvement encouraged in the planning and implementation of all CHROME activities.
- * Expand identification and distribution of local, state, and national

opportunities for teacher and counselor enhancement related to CHROME's mission.

3. To establish and sustain partnerships among businesses and corporations, higher education institutions, school systems, civic and professional organizations, government agencies, and other entities committed to the mission of CHROME.

- * Develop additional partnerships with corporations and universities outside of region who are recruiting students;
- * Increase membership by 10%;
- * Encourage organizations to sponsor a regional program;
- * Foster partnerships between member organizations and CHROME clubs

4. To support educational improvements in the areas of science, mathematics, engineering and technology education consistent with the CHROME mission and goals.

* Develop direct links with organizations which advocate the implementation of the National Education Goals with emphasis on Goal 4, Teacher Education and Professional Development; Goal 5, Mathematics and Science Student Preparation and Achievement; and Goal 6, Adult Literacy and Lifelong Learning.

*Connect with and actively recruit teachers who will participate in various in-service or professional development programs on a yearly basis.

*Obtain records from each school district to determine the rate and success of achievement of CHROME students in targeted subjects, e.g.(smet)

5. Promote CHROME as the exemplary model for the development of pre-college programs locally, nationally, and internationally consistent with the mission of CHROME.

**Insure the regular monitoring and reporting of the following to Board and other constituencies:*

- a. Number of CHROME Clubs*
- b. Number of supporting member organizations of CHROME*
- c. Number of students involved in CHROME-related activities*

- d. Number of teachers/counselors directly involved with CHROME.
- e. Number of students continuously impacted by CHROME (long term).
- f. Number of students indicating interest in science, math, engineering and technical fields after participating in CHROME.
- g. Percentage of CHROME students who graduate from high school
- h. Number of CHROME graduates attending college.
- i. Number of scholarships received by CHROME graduates
- j. Number of CHROME graduates studying smet courses in college.
- k. Number of CHROME Alumni entering careers in smet fields
- l. Number of CHROME Alumni participating as mentors for active CHROME students K-12.

**Expand the mentoring model which was instituted in the African American Male Science and Math Academy, 1996 to include greater accountability .*

Implementation

To accomplish its goals, CHROME

- 1) Operates a club program in over 85 elementary, middle, and high schools in Hampton Roads, Virginia involving over 3,000 students and 250 teachers and counselors.
- 2) Maintains a computerized database of student progress throughout their participation in CHROME and into college.
- 3) Coordinates regional programs for students, teachers, counselors, and parents.
- 4) Sponsors summer programs at member universities and research facilities.
- 5) Provides internships through member organizations.
- 6) Funds scholarships and identifies candidates for local and national scholarships.
- 7) Provides teacher training workshops supplemental to and in conjunction with member school systems.
- 8) Stimulates and supports efforts towards reform in the instruction of mathematics, science, and technology that incorporate experiential and cooperative learning.

