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BILL ANALYSIS

Senate Fiscal Agency

• Lansing, Michigan 48909

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Senate Bill 452 (as reported without amendment)
Sponsor: Senator Vern Ehlers
Committee: Education and Mental Health

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RATIONALE

The need to reform education in the United States, particularly science and math education, has been widely acknowledged in a variety of recent studies. Generally, these studies seem to indicate that the U.S. educational system is not preparing students adequately to live productive lives in an increasingly complex and technological society. The domestic affluence and international power of the United States, which reportedly was derived substantially from scientific and technological preeminence, apparently has weakened in relation to other countries, particularly Japan. Education researchers cite the following data as proof that immediate measures must be taken to encourage the teaching and study of math and science disciplines in U.S. schools:

- According to an article published in Higher Education and National Affairs (February 15, 1988), the number of engineering doctorates awarded to U.S. citizens has decreased from 2,500 in 1970 to 1,280 in 1985, while Japan, with a much smaller population than the U.S., awarded 1,290 engineering doctorates in 1983. Further, U.S. schools have had to expand recruitment of foreign students to maintain research capabilities in the wake of declining enrollments. In 1985, only 53% of engineering doctorates awarded by American universities were granted to U.S. citizens or permanent residents.
- Reportedly, a National Science Foundation study of children in 24

countries revealed that American students at three different grade levels scored well behind their counterparts in most other countries. (This included a comparison of high school seniors specializing in science subjects.)

- According to an article in the Detroit News (January 25, 1988), less than one-quarter of fourth, seventh, and tenth graders passed the science portion of the 1987 Michigan Educational Assessment Program (MEAP). Educators said this was due to poorly prepared teachers, inadequate equipment, and unimaginative programs that alienated many students from science before the middle school years.
- Time (January 11, 1988) reported several deans of U.S. universities as saying that while the U.S. has perhaps the best graduate programs in engineering, math, and science, the beneficiaries are most often foreign students, in large part because of a lack of interest in higher technical education among American students. Over 55% of the graduate engineering degrees in 1988-89 were earned by people from overseas. The article also cited one estimate that by 1992 between 75% and 93% of engineering professors in U.S. universities will be foreign born.
- An article in Higher Education and National Affairs (February 15, 1988), reported that although blacks and Hispanics represent about 20% of the

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population, they earn less than 2% of the doctorates in physics, and are said to be "grossly underrepresented" in the sciences generally. Women, moreover, earn less than 15% of all technical degrees, despite recent increases. Educators say that as the college-age population shrinks, much more needs to be done to encourage and assist women and minorities to become involved in math and science-related studies.

- An article in the Detroit News (1986) quoted the National Science Foundation's estimate that some 700,000 jobs in science and engineering could go unfilled in this country by the end of the century.

CONTENT

The bill would create a new Act to establish the State Council for Science and Mathematics Education, which would be required to do the following:

- Stimulate and encourage the study and understanding of science and mathematics by students.
- Distribute, on the basis of need, grants from funds received under the Act to school districts, postsecondary educational institutions, or other nonprofit organizations for the purpose of furthering the science and mathematics education of students.
- Accept gifts, contributions, and bequests of unrestricted funds from individuals, foundations, corporations, and other organizations or institutions for the purpose of furthering the science and mathematics education of students.

The Council would exist as an autonomous unit within the Department of Education, except for budgeting, procurement, and related management functions. The Council would consist of 15 members who were broadly representative of schools, colleges and universities, civic and community organizations, science museums, and businesses that employed persons in one or more areas of science or math. Council members would be appointed by the Governor, who would be required to designate a chairperson and a vice-chairperson from the members to serve at the pleasure of

the Governor. The chairperson would be the chief executive officer of the Council, and would be required to appoint an executive director whose duties and responsibilities would have to be prescribed by the Council. Members would serve four-year staggered terms, and would have to be reimbursed for actual and necessary expenses incurred in performing their duties.

In addition to fulfilling its required duties, the Council could do the following:

- Enter into contracts with individuals, school districts, postsecondary educational institutions, corporations, associations, or other legal entities for services furthering the science and mathematics education of students.
- Receive from any State department, division, board, bureau, commission, or agency any assistance or data that would enable the Council to carry out its powers and duties.
- Enter into any agreement or perform any act that could be necessary or appropriate to carry out its powers and duties.

"Student" would mean any public or private elementary or secondary school pupil in the State.

BACKGROUND

Public Act 302 of 1988, the Department of Education appropriation Act for 1988-89, established the Mathematics and Science Challenge Grant program. The Act required the Superintendent to appoint an advisory committee, including mathematics and science teachers, practicing scientists and mathematicians from business and industry, and representatives from higher education, science and technology museums and other agencies interested in improving mathematics and science. This committee reviewed and recommended grant recipients and will serve as an advisory committee related to the development of the centers funded by the grants. The program also was funded in the Department's 1989-90 budget.

FISCAL IMPACT

The bill would cost the State at least \$18,000

(15 members x 12 meetings per year x \$100 for reimbursement of costs per meeting).

ARGUMENTS

Supporting Argument

The bill would create a special council of gubernatorial appointees to raise the State's consciousness of the importance of science and mathematics education. There is overwhelming evidence that teachers and students alike need greater exposure to these vital subjects. Increasingly, our economy depends upon people trained in highly technical subject matters, yet many students leave school having made little effort to develop their capabilities in those areas. Many students simply are not provided adequate instruction. Designed to be autonomous and flexible, the council could accept funds from a variety of sources, including businesses and foundations, and make grants aimed at increasing student and teacher exposure to math and science. It could foster new, creative ways of teaching and establish useful relationships between the schools and outside institutions, such as science museums, universities, and technology-based industries.

Opposing Argument

While no one can doubt the worthiness of its goals, the bill could very well duplicate other efforts already underway to improve science and math education in the State, including programs launched by the State Board of Education in the wake of the poor MEAP science scores last year. Operating independently of the Department of Education, the council could prove counterproductive. It would make more sense to have the council appointed by the State Board and function under the auspices of the Department.

Response: Having members appointed by the Governor would give the council more prestige and prevent it from becoming just another curriculum committee. The council would be able to set its own priorities and respond quickly to address them.

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This analysis was prepared by nonpartisan Senate staff for use by the Senate in its deliberations and does not constitute an official statement of legislative intent.