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## Mathematics and Science Education Pays Off

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# MATHEMATICS AND SCIENCE EDUCATION PAYS OFF

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Many states have implemented legislation in an effort to improve science and mathematics education in our nation's schools. Last year, the Iowa General Assembly enacted House File #532. The bill established several innovative state programs designed to encourage greater emphasis in the study of mathematics and science. Three of these programs were to be administered by the Iowa College Aid Commission, and had direct influence on K-12 science courses, teachers, and prospective teachers. The three programs were:

- The Iowa Guaranteed Loan Payment Program designed to assist newly certified mathematics and science teachers in repaying their Iowa Guaranteed Student Loans; effective July 1, 1983.
- The Iowa Mathematics and Science Loan Program designed to provide cancellable loans for certified Iowa teachers wishing to obtain or upgrade their certification in the areas of mathematics and science; effective July 1, 1983.
- The Iowa Science and Mathematics Grant Program designed to offer grants to high school graduates who have completed a specified number of units of science and mathematics and who enroll at approved Iowa colleges and universities. Financial need is no criterion; effective July 1, 1984, for students who graduate after January 1, 1984.

The science and mathematics grant program showed bold initiative and appeared to have great potential for addressing the problems in science and mathematics directly. Sections 12, 13 and 14 of the House File 532, titled "Supplemental Grant Program," explained eligibility, payment and appropriations of the funds to high school students as follows:

A person who graduates from a public or nonpublic high school in this state after January 1, 1984, who has successfully completed at least seven units of science and mathematics courses, and at least three of the seven units include sequential mathematics courses at the advanced algebra level or higher, chemistry, advanced chemistry, physics, or advanced physics courses, and who attends an eligible institution is eligible for a supplemental grant provided in this chapter.

The department of public instruction shall transmit to the commission a list of high school graduates who have successfully completed the courses required in this section.

For the purpose of this section and section 261.33, an eligible institution is an accredited private institution as defined in section 261.9, subsection 5, an institution of higher learning under the state board of regents, or a merged area school established under chapter 280A.

Sec. 13. *NEW SECTION.* 261.33 PAYMENT OF GRANTS. A student meeting the requirements of section 261.32 may make application to the commission, on forms prescribed by the commission, for payment of a supplemental grant to an eligible institution in which the student is enrolled on a full-time basis. The maximum supplemental grant is five hundred dollars per year. Payment under the grant shall be allocated equally among the semesters or trimesters and shall be paid at the beginning of each semester or trimester upon certification by the eligible institution that the student is admitted as a full-time student and in attendance. If the student discontinues attendance before the end of a semester or trimester after receiving payment under the grant, the amount of refund due the student, up to the amount of payment under the grant, shall be paid by the eligible institution to the state.

An eligible student may receive a supplemental grant for two semesters of undergraduate study or the trimester equivalent.

The amount of a supplemental grant to a student shall not be considered when determining financial need under the Iowa tuition grant and Iowa scholarship programs.

Sec. 14. *NEW SECTION.* 261.34 APPROPRIATION. Commencing July 1, 1984, there is appropriated from the general fund of the state to the commission for each fiscal year the sum of one million, five hundred thousand (1,500,000) dollars for supplemental grants.

The reactions of local school administrators, staff and students to these initiatives were guarded, but enthusiastic. The apprehension was due to their understanding of the state's austere financial situation.

The apprehension was somewhat justified when additional state budget cuts resulted in reductions in the \$1,500,000 allocated for the grants program. In addition, greater numbers of students than were initially predicted applied for the grants. Instead of receiving the anticipated \$500, each student who was found eligible for the grant received only \$240.

To assess the effect of this reduction in funds on May 18, 1984, the Iowa College Aid Commission sent a survey to all 598 recipients of the \$240. As of June 6, 1984, 290 responses (49%) had been received. Not all questions were answered in each survey returned.

Table 1 summarizes the results of the completed surveys.

**Table 1.**  
**Iowa Science and Mathematics Grant Survey Results**

Item	Responses		
	Yes	No	
1) Did the Science and Math Grant encourage you to take additional science and math courses during your senior year?	113 (39%)	175 (61%)	
2) Do you feel that the Science and Math Grant Program encouraged others in your school to take additional science and math courses?	245 (84%)	45 (16%)	
3) Do you think extra science and math courses will assist you in your college career?	287 (99%)	3 ( 1%)	
4) Would you recommend continuing this program in the future?	283 (100%)	2 (% NA)	
5) How helpful will your \$240 grant be? (Check one)	Very Helpful	Some Help	No Help
	130 (46%)	141 (50%)	11 (4%)
6) It is anticipated that funding for this program will not be increased. Do you feel the \$240 grant will influence other students (freshmen, sophomores or juniors) in your high school to take additional science and math classes?	Yes	No	No Opinion
	223 (79%)	32 (11%)	29 (10%)



### Comments Received from 135 (47%) of Respondents:

- "Could be lowered to even \$200 so more applicants could get additional aid."
- "I wish I would have received what was originally stated that I would."
- "This program should be put on an elevated scale. Meaning the more classes the student takes, the more money they receive, or the higher the grade average in the classes, the more the money."
- "I know of some cases in my school where students were disappointed that the grant was not more and would not have taken the additional classes if they would have known the money would be less than \$500."
- "It was a nice grant that will help tremendously — too bad it had to be cut so bad though."
- "This program doesn't offer much incentive. In order for the program to be effective, funding will have to be increased. If funding is not increased, the program may as well be discontinued."
- "I know if the grant were larger it would encourage many more students to take the additional classes."
- "The original grant of \$500 was what induced me to take one more science course to complete the requirements. Cutting the amount was a low blow."
- "It would help if you would require transcripts as proof that the courses were taken. In the future, I hope the legislatures will consider that more kids will be applying and that more money should be allowed."
- "Most people who are going to take the classes will take the classes. Those who don't want to are not going to be influenced by \$240. It's a reward, and I'm thankful for it, but . . ."

From the survey one can infer that the students feel extra science and mathematics courses will be of value in college careers and that the program should be continued. There is some uncertainty as to the effect the program had upon encouraging the responding students to take additional science and mathematics courses. Item #1 indicates that most students felt the grant did not encourage them to take additional mathematics and science classes — particularly at the reduced funding level of \$240/student. The respondents' comments were reflective of the disappointment some students experienced when the \$500 was reduced to \$240.

In general, the grant program does appear to have accomplished its purpose of making mathematics and science education pay off for students — both financially and academically. It did confirm the students' perception of the value of such courses in preparation for college and career planning.

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