

POST-SECONDARY ENROLLMENT OPTIONS: WHAT DOES IT MEAN TO MATHEMATICS EDUCATION ?

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The time has finally arrived for the implementation of the post-secondary enrollment options program of Senate Bill 140. In short, the bill allows 11th and 12th grade students to apply for admission and, if accepted, enroll in college courses. These courses may be taken for either college credit or both high school and college credit.

High school students who are interested in taking college courses have two options under Senate Bill 140. In the first option, a student may elect to enroll in college courses for high school and college credit. In this case the college or university would receive that portion of the state money allocated to the public school district. For example, if a student from a school running a seven period day enrolled for one class the college would receive $1/7$ of \$2636 (FY91) provided by the state. If a student were enrolled for two or three classes the amount would be $2/7$ and $3/7$ of \$2636 respectively. Under the second option, a student may choose to take the course or courses for college credit only. In this case all costs are borne by the student.

The post-secondary enrollment options program has been controversial from its inception. Some public school officials see this legislation as a serious threat to established programs in the high school. One of the most outspoken critics is Dr. Richard Denoyer, superintendent of Princeton City Schools in Hamilton County. Dr. Denoyer contends that the enrollment option will have a negative effect on the advanced placement program, the International Baccalaureate Program, and high level academic courses in the high school. (Denoyer, 1989) Similarly, professional associations like the Ohio School Boards Association and the Buckeye Association of School Administrators have voiced opposition to numerous aspects of the Post-Secondary Enrollment Options Program. (BASA, 1991; OSBA, 1990)

Private school leaders have been somewhat undecided concerning participation in the program. Currently, Diocesan officials for Catholic schools in Cincinnati, Columbus, Toledo, Youngstown, Steubenville, and Cleveland have

approved participation on a school-by-school basis. On the other hand, Cincinnati officials initially decided not to participate in the program but reversed this decision after considerable debate. Some parochial high school principals seem to think it is an opportunity to improve the curriculum in their respective schools, while others fear the option would result in fewer students.

In an attempt to measure the opinion of current educators, a survey was made of 476 Ohio teachers who were asked to respond to the statement "High school juniors and seniors should be able to take courses at local colleges/universities for high school or college credit" using a Likert scale. The results showed overwhelming disagreement ($t=4.80$, $df=475$) at the 1% level of significance.

Needless to say, the first option for both high school and college credit will be attractive to many students and could result in an exodus of the best students from Ohio high schools. However, the school can do much to keep high school age students on the high school campus. In fact, high school mathematics departments are in an ideal position to be leaders in the curriculum reform invited by Senate Bill 140. Senate Bill 140 provides an opportunity for schools to improve the total instructional program through advanced placement courses taught in the school. The College Entrance Examination Board (CEEB) provides course descriptions and tests for college credit in virtually all high school subjects. These traditional advanced placement courses are taught in the high school by high school faculty. Students who successfully complete these programs are awarded college credit that is accepted by almost every university in the country. On the other hand, Senate Bill 140 allows students to leave the high school environment in favor of the college environment for all or part of the school day. Some educators feel that such a social change is not appropriate given the ages involved. Others feel the overall school environment will suffer due to a loss of students who have traditionally assumed leadership roles.

The Critical Role of Mathematics

We can meet this challenge by providing the opportunity for students to earn college credits through advanced placement courses in a variety of subject areas. Mathematics, however, can play a critical role in the curricular reform needed to implement advanced placement in other subject areas. Many Ohio schools already offer advanced placement calculus through the CEEB. A survey of a random sample of 200 of Ohio's 856 high schools has shown that a total of 85% already offer

a course in calculus. Table 1 gives a breakdown of the 85% by course level.

Table 1
Types of Calculus Courses
In Ohio Secondary Schools

<u>Course</u>	<u>Percent</u>	<u>Error</u>
1. Non-Advanced Placement Calculus	35%	8.3%
2. Advanced Placement Calculus AB	47%	8.7%
3. Advanced Placement Calculus BC	18%	6.7%

Similarly, CEEB programs in English, foreign languages, and social studies can be modeled after successful math programs. Even the CEEB science programs are designed for success in the standard high school environment.

The traditional mathematics programs in place in many of Ohio's schools are preparing students for calculus during their senior year. Schools that do not offer the CEEB calculus programs can easily make the necessary changes. Offering courses for college credit in the high school building will help keep many above average students on our high school campuses and among their peers.

In the past, some school administrators have skirted CEEB advanced placement courses for financial reasons. They have said that advanced placement courses are too costly because classes are small. Now there is a valid response for all teachers or departments wanting to offer courses at the advanced placement level. Further, advanced placement will make college credit available to students in rural areas that are not near a college or university.

Recommended Curricula for Advanced Placement

While not all high school students are capable of college level work, a surprisingly large number of students can do such work. Recall that an estimated 85% of Ohio's high schools offer a course in calculus (see Table 1). Table 2 shows a proposed curricula that can prepare top students for advanced placement calculus and computer science.

Table 2
A Curriculum Model

<u>Year</u>	<u>Plan 1</u>	<u>Plan 2</u>
Freshman	Algebra 1	Algebra 2
Sophomore	Algebra 2 Geometry	Geometry
Junior	Precalculus	Precalculus AP Pascal
Senior	AP Calculus AP Pascal	AP Calculus

Note that the curricula include existing courses that are in place in many schools currently operating successful advanced placement programs. It should also be noted that such courses are not static. They should reflect current research as reflected in such documents at the National Council of Teachers and Mathematics' *Curriculum and Evaluation Standards for School Mathematics* (1989) and the new *Ohio Model Curriculum* (1990).

A key to success is keeping Algebra 1 and Algebra 2 in sequence. This approach is common in many schools offering successful advanced placement calculus courses and minimizes the loss of algebraic skills. For students who do not take Algebra 1 in the eighth grade, the concurrent Algebra 2 and Geometry courses in the sophomore year have proved successful. The traditional preparation in Algebra 1, Algebra 2, and Geometry are essential prerequisites to the more in-depth precalculus course to be taken during the junior year. The precalculus course should include three quarters of in-depth work in the conic sections, trigonometry, logarithms, graphing, and analytic geometry. At least one quarter should be devoted to the study of probability and statistics.

The precalculus course will not be for every student in your school. Rather, it is intended for those students who want a solid preparation for calculus. Typically this would mean high school juniors preparing for advanced placement calculus during their senior year or high school seniors preparing for calculus for their freshman year in college.

Conclusion

Although the post-secondary options program of Senate Bill 140 invites our best students to leave our secondary schools, we can do much to retain these talented students. It is important for us to view the college option as an opportunity to improve the curriculum of the high school rather than as a problem to be solved. Due to the already strong curricula in place in our high schools, mathematics departments are in an ideal position to provide the leadership to get successful advanced placement programs into operation.

In short, the options program of Senate Bill 140 can be a motivating force to help strengthen the curriculum through advanced placement. Credits secured through advanced placement have traditionally been considered prestigious and flexible. There are countless examples of successful advanced placement programs working in Ohio schools of all sizes. These successful programs all exhibit high teacher motivation and a commitment to excellence. Mathematics educators can take the lead in this important venture where Ohio students will be the winners.

References

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- Ohio School Boards Association. Letter to OSBA Legislative Liaisons regarding a position paper on SB 140. Westerville, OH: OSBA, 1990.

Senate Bill 140 is controversial. We welcome your comments on the Flick-Boothe article – either a letter or an article. How do you feel about SB 140?

The Editors
