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Modern Mathematics in Secondary Education

A Research Theme
Presented to
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by
Sandra Sawyer
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Modern Mathematics in Secondary Education

Until recently, the mathematics curriculum in elementary and secondary schools had been relatively unchanged for a century or more. While both elementary and secondary school programs are undergoing special studies, the most extensive curriculum projects to date have been focused on the secondary school.¹

First, let us consider the purpose of modern math. There has been much criticism about changing from the traditional math to the modern math. As mathematician Allendoerfer explains: "More than anything else,

¹ Dorothy Fraser, Current Curriculum Studies in Academic Subjects (Washington, D.C.: National Education Association, 1962), p. 27.

the new math is a new approach to old ideas, a mixture of intuition, deduction, and application." William Morrill of the National Science Foundation, which has spent nearly eighteen million dollars on new math courses, sums up the appeal of new math: "There is an intellectual content to mathematics that the educated man should have and want to have if it is presented to him in an interesting and exciting way. Not: 'Here is a problem, solve it!' But rather: 'Here is a situation, think about it!'"² Professor Morris Kline of New York University states that our aim is to present the true value of math. Anything

¹ "The New Math: Does it Really Add Up?"
Newsweek, 65: 115, May 10, 1965.

² Ibid.

less is depriving the student of the fruit of learning.

There are many programs instituted to make a comprehensive curriculum study of mathematics. Perhaps the most popular and important project is the School Mathematics Study Group, or the SMSG, with headquarters formerly at Yale University and now at Stanford. Like other curriculum projects supported by the National Science Foundation, SMSG has sought to improve the mathematics program in schools by preparing text materials. The secondary school mathematics program of SMSG emphasizes the introduction of modern mathematics and a deeper treatment of traditional mathematical topics within the

¹ Morris Kline, "A Proposal for the High School Mathematics Curriculum," *The Mathematics Teacher*, 59:330, April, 1966.

course structure generally found in United States high schools, rather than a radically different sequence of courses.¹ Briefly, the content of the SMSG sample textbooks is as follows:

- Grade 7: Numeration; plane geometry
- Grade 8: Graphs; plane, solid, and nonmetric geometry; probability
- Grade 9: Elementary algebra
- Grade 10: Euclidean plane and solid geometry
- Grade 11: Algebra and trigonometry
- Grade 12: Elementary functions and matrix algebra²

Other programs include the University of Illinois Committee on

¹ Trasser, *op. cit.*, pp. 33-34.

² Robert W. Heath, New Curricula (New York: Harper and Row, 1964) p. 42.

School Mathematics, the University of Maryland Mathematics Project, Ball State Teachers College Experimental Program, and Boston College Mathematics Institute.¹

Nearly thirty million pupils are being reached by the new curriculum programs. Of all the states, California quickly recognized the potential of the latest curricular developments and expanded their courses of study to include modern math as soon as it was feasible.

In instituting the various programs, California spent nearly ten million dollars on new textbooks alone.²

Thirty-one of the largest districts in California were selected to be studied. In all, representatives of twenty-eight districts responded

¹ Fraser, *op. cit.*, pp. 37-40.

² Anthony Saville, "Implementing Modern Mathematics in Selected California Schools", Journal of Secondary Education, 40:34, January, 1965.

for a ninety per cent return. The survey dealt mainly with finding the problems encountered in implementing the modern mathematics program in the high schools. The returns showed that the most prominent problem was selecting and directing an accurate program. Training teachers adequately and obtaining funds for new texts were some of the other highly rated problems. When asked how the program was initiated, nineteen schools reported using selected experimental pilot classes in the senior high level as a preliminary step in the program. Then it was expanded gradually. Only one school reported initiating a crash program!

Another state which has expanded and revised its

¹ Saville, *op. cit.*, p. 27.

mathematics program is Oklahoma. Oklahoma began its effort to improve mathematics with a workshop during the summer of 1957. When experimental centers were finally allocated, Oklahoma had seven of the forty-nine scattered throughout the United States!

It would be hard to detail all the projects and programs that have been instituted in the United States. As in any experiment the final and most important question arises: Have the various programs been successful? This is one question that cannot be answered with a definite yes or no.

¹ James H. Zant, "Better Mathematics Teaching with Special Reference to Oklahoma", Saturday Review, 48:63, March 20, 1965.

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However, mathematics education that is quality for this moment becomes rapidly outmoded as we move forward along the continuum of time.

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