COMPUTERS IN EDUCATION:
A COMPARISON OF COMPUTER-ORIENTED AND TRADITIONAL MATHEMATICS UNITS IN ALGEBRA II AT WESTON HIGH SCHOOL WESTON, CONNECTICUT

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AN ABSTRACT OF

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One question facing high school mathematics departments is how to make effective use of computers and computer programming within their curriculum. Evaluation of existing programs utilizing computers must be done to determine their effectiveness.

The problem of this investigation is the comparison of computer-oriented mathematics and traditional classroom mathematics. Two Algebra II B level classes at Weston High School were the subjects of this study. Each group was taught an introductory unit in programming in the BASIC (Beginners All-purpose Symbolic Instruction Code) language. The actual study consisted of two units, the first concerning linear equations and the second concerning simultaneous equations. In the first unit, one class was taught in a traditional situation while the second was taught in a computer-oriented situation. For the second unit, the methods in each class were reversed.

Hypothesis

There is a significant difference in comprehension between students taught in a computer-oriented Algebra II

class and those taught in a traditional classroom situation.

Null Hypothesis

There is no significant difference in comprehension between students taught in a computer-oriented Algebra II class and those taught in a traditional classroom situation.

In each unit, the evaluation of gain scores from the pretest to post-test by use of the t-test yielded values less than the 2.021 needed to be significant at the .05 level. Thus the hypothesis must be rejected and the null hypothesis accepted.

The results of this testing indicated that for the size and type of sample and the particular units tested there was no significant difference in comprehension. The nature of the units perhaps affected the result of the testing. The content of the units was similar, in that the first unit concerned the basics of linear equations while the second concerned systems of linear equations. Consequently, the concepts studied in the first unit affected those studied in the second. Also because of this similarity, it was necessary for Class A to learn some of the programming ideas of the first unit before being able to write the program on simultaneous equations.

The length of the units, each approximately two and one-half weeks, also affected the testing. A more conclusive study might be accomplished by spending an entire year teaching groups by the different methods (as in Project LOCAL discussed in Chapter II). The testing could then be based on the comprehension and achievement of a year rather than two short units. Tests such as those used by Project LOCAL, the Scholastic Aptitude Test and the Abstract Reasoning Test, perhaps would indicate more than a post-test on one particular unit.

The size and type of sample was also limited, due to the nature of the school and town. A larger and more varied sample of a high school population perhaps would lead to other conclusions.

Another result of the units on computer programming was the attitude of the students. There was an excitement on the part of the students when they were trying to write programs especially when success was achieved. This excitement was maintained through further units studied by the groups, especially Class B which first studied programming. This attitude change was not tested in this study, but would make a valuable and interesting topic for another study.