
Agenda for Action: Recommendations for School Mathematics of the 1980s

National Council of Teachers of Mathematics

Editor's Note - *The Agenda for Action*, published in April 1980, had eight recommendations. Recommendation three deals with the use of calculators and computers in the classroom of which the specific reference to computers is of interest here.

Recommendation 3

Mathematics programs must take full advantage of the power of calculators and computers at all grade levels.

Beyond an acquaintance with the role of computers and calculators in society, most students must obtain a working knowledge of how to use them including the ways in which one communicates with each and commands their services in problem solving.

The availability of computing aids, including computers and calculators, requires a reexamination of the computational skills needed by every citizen. Some of these computational skills will no longer retain their same importance, whereas others will become more important.

It is recognized that a significant portion of instruction in the early grades must be devoted to the direct acquisition of number concepts and skills without the use of calculators. However, when the burden of lengthy computations outweighs the educational contribution of the process, the calculator should become readily available.

With the increasing availability of microcomputers at decreasing costs, it is imperative that schools play an active part in preparing students of the 1980s to live in a world in which more and more functions are being performed by computers.

Recommended Actions

- 3.1 *All students should have access to calculators and, increasingly, to computers throughout their school mathematics program.*

Schools should provide calculators and computers for use in elementary and secondary school classrooms.

Schools should provide budgets sufficient for calculator and computer maintenance and replacement costs.

3.2 *The use of electronic tools such as calculators and computers should be integrated into the core mathematics curriculum.*

Calculators should be available for appropriate use in all mathematics classrooms, and instructional objectives should include the ability to determine sensible and appropriate uses.

Calculators and computers should be used in imaginative ways for exploring, discovering, and developing mathematical concepts and not merely for checking computational values or for drill and practice.

Teachers should ensure in their classroom management that the use of computers by individual students in isolated activity does not replace the critical classroom interaction of students with peers and teachers. The healthy give-and-take of group work and discussion, which promotes values of communication, cooperation, empathy, mutual respect, and much of cognitive development, remains essential.

3.3 *Curriculum materials that integrate and require the use of the calculator and computer in diverse and imaginative ways should be developed and made available.*

Schools should insist that materials truly take full advantage of the immense and vastly diverse potential of the new media. In particular, developers of software should be cautioned that just to use conventional material and techniques newly translated to the medium of the computer will not suffice.

Educators should take care to choose software that fits the goals or objectives of the program and not twist the goals and developmental sequence to fit the technology and available software.

3.4 *A computer literacy course, familiarizing the student with the role and impact of the computer, should be a part of the general education of every student.*

In cooperation with schools and professional teacher organizations, funding agencies should support the development of courses in computer literacy for both junior and senior high school levels.

All mathematics teachers should acquire computer literacy either through preservice programs or through inservice programs funded by school districts in order to deal with the impact of computers on their own lives and to keep pace with the inevitable sophistication their students will achieve.

Colleges should provide courses for both preservice and inservice education in computer literacy, programming, and instructional uses of calculators and computers.

Professional organizations should provide information through their various media, conferences, workshops, and seminars to aid in the inservice education of teachers in uses of the calculator and computer.

- 3.6 *Secondary school computer courses should be designed to provide the necessary background for advanced work in computer science.*

Curriculum design should provide the required foundation for those students who will be involved in careers that increasingly demand advanced computing skills and applications of computing and for those students who will go on to deeper study in frontier fields of computer development.

- 3.7 *School administrators and teachers should initiate interaction with the home to achieve maximum benefit to the student from the coordinated home and school use of computers and calculators.*

Criteria should be developed to assist parents and school personnel in their selection of home/school computing hardware.

Professional organizations of teachers, mathematicians, and computer scientists should develop guidelines to aid schools, teachers, and parents in the selection of educational software.

The uses of technological devices such as calculators, computers, video disks, and electronic games in the home and other out-of-school places should be anticipated. Programs should be planned that will encourage the positive and educationally beneficial use of these devices.

As home computers come into wider use, homework should be assigned that can take advantage of their potential in problem solving.

- 3.8 *Educational users of electronic technology should demand a dual responsibility from manufacturers: the development of good software to promote the problem-solving abilities of the student and, eventually, the standardization and compatibility of hardware.*
- 3.9 *Provisions should be made by educational institutions and agencies to help in the necessary task of educating society's adults in computer literacy and programming.*
- 3.10 *Teachers of other school subjects in which mathematics is applied should make appropriate use of calculators and computers in their instructional programs.*
- 3.11 *Teacher education programs for all levels of mathematics should include computer literacy, experience with computer programming, and the study of ways to make the most effective use of computers and calculators in instruction.*
- 3.12 *Certification standards should include preparation in computer literacy and the instructional uses of calculators and computers.*