State of Iowa
DEPARTMENT OF PUBLIC INSTRUCTION
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Grimes State Office Building
Des Moines, Iowa 50319

1971 Curriculum Circular No. 5

COMPUTER INSTRUCTION IN IOWA SCHOOLS

March, 1971

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COMPUTER INSTRUCTION IN IOWA SCHOOLS

One of the greatest problems facing educators today is how, within the budget allowed for education, to adequately prepare young men and women to live in a world of advanced technology. One of the areas in which costs are high is the area of computer science education. The following information has been gleaned from many sources and compiled in an effort to help administrators make decisions at the local level.

A RATIONALE

The computer is changing human history and is here to stay; no longer is this debatable. It is a tool for extending man's thinking powers. The computer portends something as consequential as the industrial age when power was applied to supplement man's muscle. The age of the computer has developed so quickly and with such an impact that the man in the street views the computer with awe, fear and distrust. The information available to students and their parents in newspapers, magazines, television and films usually emphasizes the dramatic nature of computers and automation and plays down the role of man. Consequently, the Man-Machine System is viewed as a Machine-Man System. The most dangerous of the misconceptions about the computer is its potential for "taking over" or controlling man and his world. The possibility of myth becoming a reality increases if educators ignore the need to prepare students for the automated age.

Students entering high school in 1970 will be 45 years old in the year 2000. By that time, two significant realities of the computerized age will be a part of their everyday life: the computer utility and the cybernated system.

Widespread use of the computer utility could mean a computer terminal in every home, as familiar as the telephone or cable television. Telephones and television, however, do not have the vast implications for social and cultural change which computers have. The cableless, checkless society is technically feasible now and sure to be a reality in the year 2000. Banking and all exchange of goods can be accomplished using computers without the transfer of actual money.

The scientific know-how to automate U. S. industry completely is already available and is certain to be used. When cybernated systems do, indeed, completely automate industry, a new ethic other than the sanctity of work will have to be found. Meanwhile, the computer--the cause of all this--remains little understood and often poorly used.

Two educational tasks are vital in the changes being wrought by the computer. Education must begin these tasks if students are to receive a relevant education.

-- The primary goal of the computer instruction should be to provide a degree of "computer appreciation" for as wide a segment as possible.

-- More difficult to tackle and with much broader implications is to prepare students to live in a world so drastically changed by automation that the old values, occupations and roles no longer have meaning.

The "instructional" roles for the computer, as opposed to data processing for school administrators, include precareer training, problem solving as a "curriculum extender," and computer appreciation units or courses.

Computer appreciation is more than the study of automation. It includes understanding the simplicity of the machine responsible for the computerized age. This basic understanding of "what is a computer?" should be available to all students. It should not be considered a technical topic worthy of examination only in mathematics or career courses. The computer itself, need not be studied in detail or at a high level of complexity, but study of a simple computer with a simple language--even a hypothetical one--could remove mystery. The notion that computers do not "think," but must be instructed by a human being, is not easy for a student to understand until he tries instructing a computer himself.

STEPS FOR INITIATING COMPUTER INSTRUCTION

A careful study involving administrators and curriculum coordinators, as well as teachers from several subject areas, should result in decisions in the following order:

-- Curricular areas to be involved

-- Teacher training

-- Unit and course content

-- Selection and/or adaptation of programing languages to be taught and used

-- Selection and development of resource materials

-- Equipment

Just a note in reference to the first--curricular areas, often is made "easy" when a mathematics teacher indicates interest in initiating a computer program. Too often, however, this means decisions are made on the basis of "what is needed for mathematics" rather than "what is needed

for computer instruction." If mathematics teachers make all decisions in the early stages, business teachers might give up in disgust, social studies teachers turn their backs and science teachers may or may not be slightly interested.

The specification of course and unit content implies either the existence of trained teachers or the assistance of competent outside help. The opinions of several outside consultants, however, should be sought rather than relying on the possible prejudices of one individual.

The selection of programing languages is critical. Too often, FORTRAN is used for instruction simply because it is available. However, for the noncareer training or problem solving, the simplest possible language to teach and use is the best device. An example is the conversational BASIC. For simple hands-on practice with a computer, the most straightforward and simple machine language available is preferred. If one does not have freedom of choice, appropriate subsets of the available languages may be identified for instructional use.

Resource materials are more likely to be "developed" than "selected." Seldom is there a single text available which is exactly appropriate for one's objectives.

Finally, equipment selection can follow evaluation of all computers and terminals.

PLANNING FOR COMPUTER INSTRUCTION

-- The planning committee could include one representative from each of the following areas: social studies, science, business education and mathematics.

-- The planning committee must realize any unit or course will demand more time of the teacher than any other course he has ever taught.

-- A lecture-type approach usually is discarded after a few days in favor of a lab-tutorial system.

-- Teachers must develop their own audiovisual aids and mimeographed materials.

-- Released time for such activities, and help in supervising computer labs, relieves the pilot teacher of some of the burden.

-- Ascertain what computing equipment is available locally. Investigate local businesses, banks, area units, government agencies, colleges and universities.

-- What teachers and resource people in the community have had training or experience with computers?

-- These teachers can serve as leaders in planning curriculum content.

-- What teachers, though untrained, are interested and willing to teach about or with computers?

-- What funds are available?

-- How can teachers be trained?

-- What are the objectives for computer instruction in each of the five curriculum areas listed below:

    -- What content should be taught to reach the objective?

    -- What length unit or course can be implemented best in the beginning?

-- What programing language should be taught?

-- What equipment will you need for the course you plan to offer?

-- What will the cost be?

Any person wishing more details concerning the operation of this kind of a program or extra copies of this circular should contact:

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