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COMPUTER-ASSISTED INSTRUCTION:
TRENDS AND ISSUES IN LANGUAGE TEACHING

Frank Otto

There has been considerable interest expressed recently in designing and implementing exemplary programs to teach native and foreign languages with the assistance of a computer. As we study the feasibility of such projects, we must objectively determine what ways and to what extent computer-assisted instruction (CAI) can make a unique and significant contribution to teaching languages more effectively.

The purpose of this paper is twofold:

1. To outline and comment briefly on aspects of teaching and learning languages that lend themselves favorably to the utilization of CAI. Variables will be discussed in terms of different methodologies and teaching styles. Unique aspects of CAI and learning will be discussed as they relate specifically to language teaching.
2. Types of delivery systems will be discussed in terms of their roles in the development of model materials for teaching languages via CAI. Main frame systems will be discussed. TICCIT-ESL segments will be available for review to interested conference participants (at a time designated by conference officers.) Call-up systems will be discussed. PLATO-ESL mini lessons will be available so that interested participants may have a hands-on experience with this type of material. (Time determined by officers.)

Other applications include video disk and video tape which will be discussed as they relate to points 1 and 2 above.

As a result of two decades of research undertaken at universities and corporations and multi-million dollar expenditures by federal and state governments and by corporations, the development of computer-based instructional systems has moved into a demonstration and dissemination phase.

Certain media selection considerations should be kept in mind when contemplating whether or not to utilize CAI:

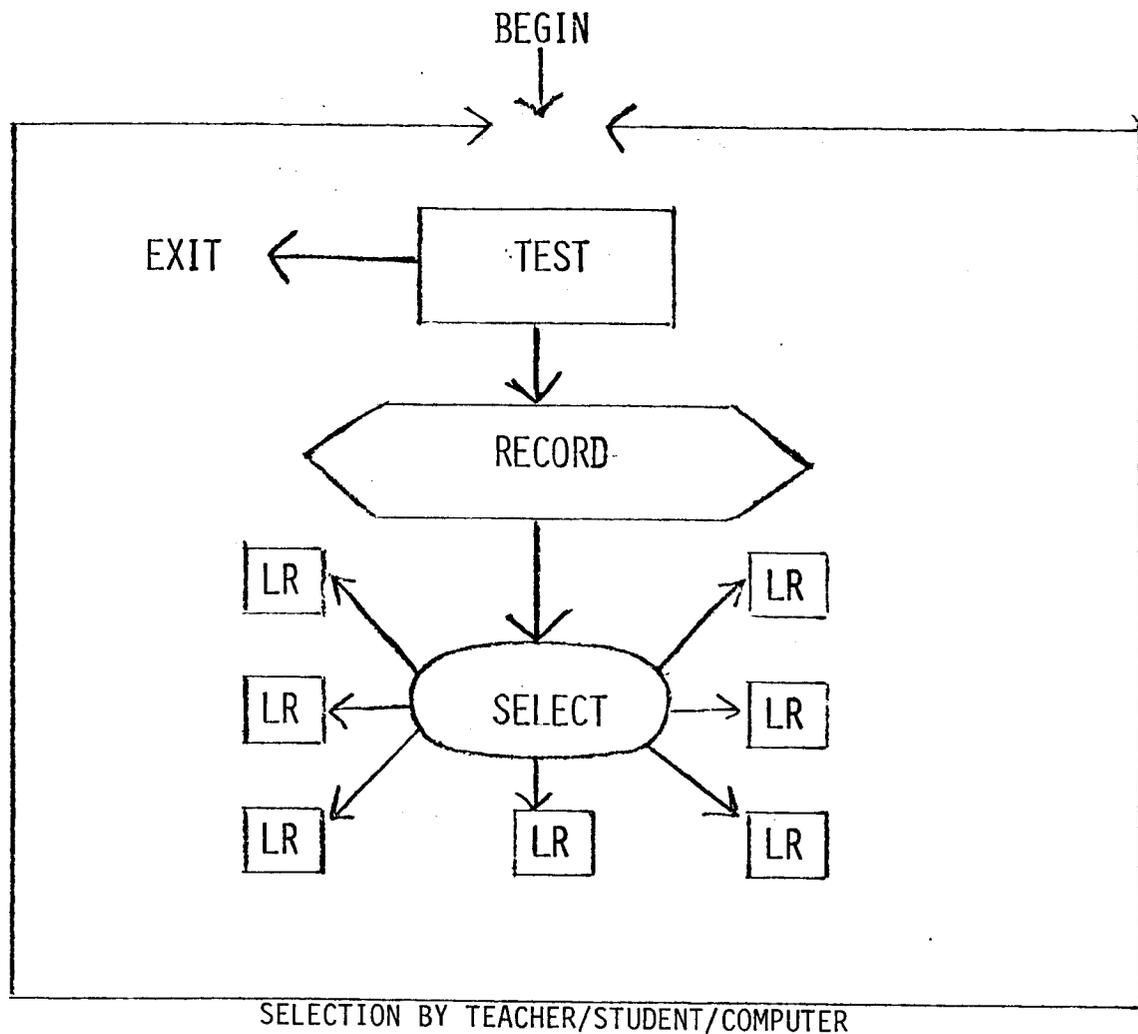
1. The objective requires interaction
2. Content and possible teaching approaches require feedback for different student responses
3. Content is more objective than subjective
4. There is need for separate student paths

Perhaps it is wise to clarify some terminology that will be used throughout this presentation. The most basic equipment (hardware) used to deliver CAI includes a computer which stores and transmits educational material and information (courseware) by means of a specialized computer language (software). The computer is less often seen by students and

teachers than the familiar learning stations (terminals). The learning station appears as a television or teleprinter which displays instruction and graphics information and has a keyset attached to it. Students interact with the computer by means of a keyset which has the standard typewriter keys with additional special function keys. Teachers use these learning stations to select curricular materials for their students; to decide the sequence of these materials or to provide their students with an index of lessons from which to choose; to monitor their students progress; and, in some cases, to prepare their own courseware.

The educational promise of CAI lies in its ability to individualize and personalize the instructional process and to simulate experiences not readily available. CAI lessons (courseware) can serve as text, test, and tutor while compelling students to be active participants in their own learning.

INDIVIDUALIZED INSTRUCTION



Students work at their own pace while their CAI lesson monitors their progress and effectively prevents them from continuing to more advanced instruction unless mastery is demonstrated. Students are kept informed of their progress through immediate feedback and achievement summaries and have varying amounts of control over their learning in that they can review previous instruction, request special help, or continue on to enrichment activities. The instruction can be systematically prepared, sequenced, tested, and revised.

CAI is usually prepared following one or a combination of three major modes: drill and practice, tutorial, and simulation.

The drill and practice mode has proved to be the most widespread, probably because it is the easiest to prepare and can be used to free teachers from the drudgery of making up and checking practice exercises. Typically, students are given a series of related questions to answer and are provided immediate feedback to the answers they give. Often, as the student demonstrated mastery, more difficult questions are posed by the computer.

In the tutorial mode, students are presented with instruction interspersed with appropriate questions. Often the student is allowed to ask related questions which the computer answers. Question formats are commonly multiple-choice, matching, fill-in and short answer. Sophisticated CAI systems can catch or allow for misspellings, judge as correct a variety of possible answers including synonyms and phrases and complex arrangements of them, and even allow students to touch portions of the display to elicit a computer response.

The simulation mode is perhaps the most exciting, for it can allow the student to use the computer as a tool to discover and generate new information. Educational games, another type of simulation, are captivating if not motivating for the intended learning activities. It is anticipated that the simulation mode will be prepared and used much more often as instructional developers and teachers become more familiar with it.

I am extremely optimistic about the future of computer-based instruction. My optimism is based upon current technological, psychological, and social trends which are likely to lead to significant development by the year 1990.

First, the technological trend toward miniaturization, improved computer power, and the remarkable reductions in unit-cost due to "chip" technology has now made it possible for all students in all of our academic institutions to take advantage of new, powerful, educational tools. By the year 1990, we will see a rich array of educational systems allowing universities to specialize in areas of interest and to cooperatively share resources and programs without concerns for equipment or location. It will be possible to launch a communications satellite, totally devoted to science and education, thereby eliminating "distance" as a physical and economic barrier to the access and use of CAI programs. Computer-based, video-disc systems will be the basis for "intelligent video books" which will

be capable of presenting interactive programs, controlled for reading level and vocabulary, and which will be automatically adaptive to student performance. Book-sized, personal computers with the power of today's small machines, will be as ubiquitous as hand calculators and will be used for everything from computer art to solving differential equations.

Secondly, research trends in cognitive psychology and instructional systems are shifting from an emphasis on effective methods to acquired facts and skills to the study and development of intelligent, knowledge-based systems are being developed which so thoroughly "understand" the subject domain and the student's grasp on the subject matter that they are able to assist the student to recognize, articulate, and use diverse forms of information in problem-solving environments. These developments are not simply new wrinkles in educational research, they are assaults upon the basic questions of "what is knowledge?" and "how is it best acquired?" These research efforts are laying the foundation for the solution of a much larger set of educationally significant problems that has even been considered in the past.

The third and possibly the most significant trend is social in terms of the positive change in the public attitude toward computers in education. The ever-widening acceptance and use of computers by scientists, engineers, and businessmen, and the broad public enthusiasm for programmable calculators and computer-based games is producing a transformation in social values which will have a profound impact upon education in 1990.

By 1990 the cost of computer-assisted instruction will be so inexpensive and its applications so broad that it will be viewed as an educational necessity.