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ABSTRACT

The experimental use of computer assisted instruction (CAI) to replace conventional laboratory sessions for first-year German students at the State University of New York, Stony Brook, is described. Materials used in the program are outlined, including hardware, pre-text program, text program, student manual, and diagnostics. Pedagogical implications, objectives, rationale, criticisms, and interim judgments are offered, with special attention to CAI's effectiveness in developing reading and writing skills. (AF)

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A TYPE OF COMPUTER-ASSISTED INSTRUCTION

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Introduction

Computer-assisted instruction (CAI) in German was first used with students at the State University of New York, Stony Brook, during the academic year 1965-1966 in an experimental self-study program carried out by volunteers. By June 1966, the mechanical aspects of the program were sufficiently refined to permit the incorporation of CAI into the first-year German curriculum, effective September 1966.[1]

At Stony Brook there is a two-year language requirement. This amounts to a total of four semesters of three credit hours each. In addition to three contact hours, the student is required to attend a language lab twice a week for fifty minutes or three times a week for twenty-five minutes during the first year. Without attempting to equate the two kinds of labs, we substituted a CAI lab for the two fifty-minute sessions in the conventional lab. One section out of ten was selected as a CAI section, not a statistically representative sampling, but sufficient for evaluating the feasibility of such a program. This did not alter the structure of the course from the student's standpoint, although he could, and often did, spend more time at the terminal than he would have in the conventional lab. The Modern Language Aptitude Test was given at the start of the year to the CAI students and the Modern Language Achievement Test was given at its end. The text employed in the CAI course was Harold von Hofe, *Der Anfang,* revised ed. (New York: Holt, 1963). The direct method was used, augmented by supplementary pattern drills in the time gained by relegating written work to the new lab.

Pedagogy

Foreign language instruction should have as its objective the teaching of four skills: listening, speaking, reading, and writing. It is generally agreed that listening and speaking should be stressed in the classroom since reading and writing are partial skills which could be, though ideally are not, self taught. Since the audio-lingual method is often employed to the detriment of the partial skills, and since many educators feel that its end product is a person trained in language who cannot avail himself of the literature of his target language, debate continues among foreign language teachers as to the efficacy of various methods of teaching.

We believe that CAI offers a resolution of this issue. In our course the teacher used the direct method, a choice dictated by the text. With a different text, a different method could have been used. During the three hours of contact between teacher and student nothing but German was spoken. As nearly as was feasible a total German experience was provided. Computer-assisted instruction teaches spelling, dictation, translation, vocabulary, etc., for none of which, incidentally, is time found in class under the audio-lingual method. So much the better, for if the so-called partial skills can be taught outside the class, then the teacher can be more effective in the class, teaching what the machine cannot teach.

Materials

The following outline will suggest the state of the still evolving CAI program:

HARDWARE: The student works through a typewriter-like keyboard. In conjunction with the written program there are tapes and a slide projector which presents a visual image used with listening comprehension exercises. The slides and tapes are controlled by the program. (We were very interested in discovering whether the foreign skill required, typing, would slow the program and interfere with the students. This did not prove to be the case.) The student may check his work on the print-out which appears before him. This print-out is kept on file.

PRE-TEXT PROGRAM: Ear training is conducted through audio discrimination drills. The student learns to distinguish between German and English sounds through minimal pairs as in the words /bit/ (biet') & /biyt/ (beat); subsequent to the English/German contrast drills, there are German/German contrast drills (e.g., *Hüte/Hütte*). In addition there are pronunciation exercises with immediate playback so that the student may check his pronunciation against that of the native speaker, item by item. In graphemics or spelling exercises the student learns to associate sound and symbol; here he must choose which symbol fits a specific sound and he is immediately reinforced or retested as necessary.

TEXT PROGRAM: The typical chapter consists of an A and a B track. Each track consists of four substitution-transformation drills, a translation exercise, an audio drill (either dictation or

listening comprehension) and vocabulary drills. Formal tests and reading exercises are being incorporated into the program at present.

STUDENT MANUAL: In addition to the textbook, the student receives a manual which explains various procedures and conventions of the CAI program. The manual contains an index telling the student where specific grammatical points are discussed not only in his textbook but also in a standard review grammar and on a popular one-page, plastic-coated abstract of German grammar. Each of the grammatical items is given a numerical designation.

DIAGNOSTICS: Although the computer conceivably could be used to analyze any student response for a multitude of grammatical errors, it seems much more purposeful to construct the drills to test the student a meaningful number of times on the one or two new items introduced per track. Using the numerical designations mentioned above, the computer tells the student how many mistakes he has made on specific items. Naturally all student responses are edited and no incorrect response is accepted. The student, however, is reminded only of errors in items diagnosed.

OBJECTIVES

The CAI lab is designed to accomplish the following: mastery of reading, writing, and grammar-translation outside the classroom. The total contact time can be used in habit-forming activity. Testing can be taken over to some (and perhaps a very great) extent by the system. The student is subjected to forced and supervised study. A self-study program is offered which rewards or penalizes the student: the student may not proceed until he has done the exercise correctly; conversely, if he has shown proficiency he may exercise an option to skip to the next drill. Any remedial work not needed can be skipped immediately. Thought-provoking tasks help to alleviate the boredom which is so prevalent in conventional language labs. Furthermore, the teacher is freed from the burden of testing.

RATIONALE

By no means do we advocate doing away with the conventional language laboratory. We simply feel that a CAI lab can relieve foreign

language teachers from the tedium of supervision and administration of large numbers of students. If materials for the conventional language laboratory were carefully programmed they could be improved to provide proper pedagogy and supervision. Nonetheless, they are at present primarily addressed to the mastery of *one* skill, listening comprehension, which can be taught in conjunction with speaking, whereas the CAI lab can already teach two skills (reading and writing) and supervise the program as well. It seems obvious that CAI is not a replacement for our present lab, but that it is a new kind of language lab. There is a need for both, which, if used in conjunction, would permit the teacher to address himself to eliciting production or engaging in dialogue with his students. Let us repeat: this is a task which our present machinery cannot yet perform, nor does it promise such a capability in the forseeable future.

Criticisms

The CAI program is not without its disadvantages. At present the materials are based on von Hofe's text, which would make their use awkward with another text and another teaching method. We are presently rewriting the program to make it more flexible in its application, i.e., we are attempting to confine the vocabulary and exercises to the *expression* side of the language, minimizing content elements, which necessarily tend to reflect the peculiarities of any one text. This disadvantage, however, is also a disadvantage of the conventional language laboratory, since tapes are customarily text-bound. Clearly both CAI and the conventional language labs should be working towards developing independent programs which stress basic skills and basic vocabulary.

While it is true that the CAI lab as it presently stands is more costly than the conventional lab, any such comparison is somewhat misleading. Firstly, as we all know, language labs are doing at best only part of what they should be doing; if they were to be more effective they would be considerably more expensive. Secondly, the CAI lab provides instruction in two skills, obviously reducing the teaching burden much more significantly than does the conventional lab (to say nothing of administration and supervision). In any case, the cost has to be weighed against its effectiveness.

Interim Judgments

Before closing we would like to give some tentative impressions

of the results achieved thus far. Certainly we can say that CAI has surpassed expectations acquired from earlier experience with the conventional language lab. It keeps the students at work and this clearly helps the poorer students. No student who kept up with the program received a grade lower than a C for the first semester. The results of the Modern Language Achievement Test given at the end of the year indicate that the CAI group was markedly superior in writing when judged by the national norms supplied for that test. The development of the other three skills was parallel to that of a first-year audio-lingual-method group similarly tested. When the scores for the four skills were lumped and averaged, none of the CAI students fell within the bottom quartile nationally. All of this would indicate that the CAI lab had done its job quite well.

It is still too early to judge accurately what effect it has had on the better students, since we all suspect that they do well under any system. But we can report that the students, good and bad, do like it. And what is more, *we* like it—enough so that we hope to expand the program next year to include 150 students, a far more representative sample. In addition we are proposing homogeneous grouping, credit, and grade incentives for advancement and the ultimate incorporation of third-semester materials which could be completed during the first year. Our objective is not to push the students through quickly, but rather to up-grade simultaneously first-year materials and the performance of first-year students.

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[1] The initial impetus for the CAI German program came from Dr. E. N. Adams of the Thomas J. Watson Research Center of IBM. We are indebted to Science Research Associates (Chicago) for the use of a pre-release version of their German CAI program. Those interested in a technical description of the computer programming involved are referred to an article presently in publication, "Conversation with a Computer as a Technique of Language Instruction," by Drs. Adams, H. W. Morrison, J. M. Reddy, all of IBM. A more detailed description of the hardware, for the layman, can be found In *GQ*, XL (March 1967), 282-283.