

USES OF COMPUTER-ASSISTED INSTRUCTION IN TEACHING FOREIGN LANGUAGE IN AN URBAN SCHOOL SYSTEM

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The use of computers in education has increased considerably in recent years. It has been estimated that by 1987 there were over 2 million computers in schools (Woolfolk 1990), with 95% of U.S. schools owning at least one computer (Sutherland 1990). As the acquisition of technology continues to increase, it is projected that the average student-computer ratio will decrease in the next few years from a present level of close to 30:1 down to 4:1 (Newman 1990). Critical factors for spurring this growth appear to be the greater response of schools to the integration of computers in the classroom coupled with decreasing hardware prices and higher quality software.

The best known and most widely used application of computers in education is computer-assisted instruction (CAI). CAI has the important potential advantages of allowing students to learn at their own pace, providing immediate feedback for student responses, and offering an alternative mode to supplement conventional methods (Hannafin & Peck 1988; Samojeden & Rauch 1982). Limitations of CAI include the difficulty of finding and selecting quality software, the expense of purchasing equipment, the difficulty of revising school schedules to accommodate its use, and the lack of educationally sound goals for its integration with the curriculum (Dudley-Marling & Owston 1987; Samojeden & Rauch 1982; Woolfolk 1990).

In the specific case of teaching foreign languages, increasing information on CAI can be found in foreign language periodicals and journals, thus suggesting a growing interest of language educators in this area. As for other subjects, drill-and-practice programs are also the most frequently employed for foreign language (Pusack 1983). Typical applications are used to reinforce grammar exercises, verb conjugations, and other properties of language instruction. Examples of these types of programs include *Bataille de mots*, which is designed to facilitate vocabulary acquisition; *Terroriste* and *Le Deménagement*, which are simulation games requiring language usage, and *La Corrida*, which is used to expand Spanish vocabulary. Because listening comprehension skills are a major component in learning a foreign language, the presentation of sound with the text display adds another dimension to the CAI experience by permitting the student to read the text displays and hear the passages spoken simultaneously (Dunkel 1987). For example, *Le Français par ordinateur*, created by D.C. Heath

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and Company, consists of a series of exercises that have been designed to teach French vocabulary and grammar rules using sound as a component.

Aside from CAI, other uses of computers for teaching communication skills in a foreign language have also been made. Cohen (1987) reported using the computer to simulate commercial situations in his foreign language business class. Underwood (1987) used a computerized electronic mail system called *CORREO* to communicate with his college students in Spanish. He noted that students consulted with him more often electronically than they did during office hours, and, in the process, received practice in writing Spanish using stylistic conventions of everyday speech.

Despite these promising applications, acceptance and usage of computers for teaching do not appear as high in foreign languages as for other school subjects (e.g., mathematics, social studies, and science). Over 10 years ago, Olsen (1980) interviewed college foreign language instructors about whether their department would like to use CAI. Their response largely conveyed that CAI was a waste of time, energy, and money that should instead be used to buy library books. More recently, Dunkel (1987) characterized the majority of foreign language teachers as remaining skeptical of the value of the computer medium over text. Specifically, the foreign language instructors opposed to CAI tended to believe that computers would be one more of a series of technological tools that are now in vogue but will fade away in the future.

To gauge current developments, the present study was designed to examine how and to what extent computers are being used in the teaching of foreign languages at the junior high and high school levels within a large urban school system. In addition to describing group and individual practices, the results were expected to suggest possible directions to software developers and

teachers for making computer applications more accessible and more productive in the future. The basic methodology consisted of surveying and interviewing teachers of Spanish, French, and German regarding their uses of and attitudes toward computers in foreign language instruction. Specific research questions addressed were as follows:

1. For what purposes and to what extent are computers used in the teaching of foreign languages?
2. What are the attitudes of foreign language teachers toward CAI?
3. What are the perceived advantages and disadvantages of CAI for foreign language teaching?
4. What factors account for why computers are used in teaching foreign language in some schools but not in others?

METHOD

Sample

A sample of 64 teachers was randomly selected from a total Population of 145 teachers of junior high or high school French, German, or Spanish in a large urban school system in Tennessee. The school system is currently the 15th largest in the nation, serving close to 110,000 K-12 students in 100 elementary schools, 23 junior high schools, and 29 high schools. The racial breakdown is approximately 80 percent black and 20 percent white (or other). Of the original sample, 55 teachers (83%) responded by returning a completed copy of the survey. An interview was later conducted with 10 randomly selected teachers from the overall sample. All of those originally contacted (100%) completed the interview. Teachers in the final sample ranged in age from 20 to 59. There were 8 males and 49 females; 54.5% held a Master's degree in foreign language and 36.4% held a bachelor's degree. Spanish was taught by 79%, French by 40%,

and German by 5% (note that some teachers taught more than one foreign language).

Survey

The printed survey consisted of 19 questions, organized in 3 different sections. Part 1 contained seven items dealing specifically with teachers' computer experiences (e.g., knows how to operate a computer, currently uses a computer, is familiar with foreign language software, etc.). Most of these items were answerable by two- or three-point scales representing degree of use or knowledge (e.g., "yes or no," or "extensive, some, or none"). Part 2 contained 10 items asking teachers to react on a five-point Likert-type scale to statements regarding the desirability of using computers for foreign language instruction. Descriptions of these statements may be seen on Table 1. Part 3 contained two open-ended questions asking teachers to list the major potential advantages and disadvantages of computers for teaching foreign languages.

Teachers were mailed copies of the survey and were asked to mail the completed survey back to the first author, using a self-addressed stamped envelope. They were told that their responses would be kept confidential; an identifying number would be recorded only to determine who returned the survey. Those who did not return it were mailed a follow-up request.

Interview

The interview with the subsample of 10 teachers was conducted by phone and lasted approximately 10 minutes. The questions asked for opinions and impressions regarding (a) the current status of computer applications in foreign language compared to other subjects, (b) how they might use computers in their own courses, (c) the types of programs teachers might use, and (d) the future of computers in foreign language education.

RESULTS

Knowledge and Background

Responses to Part 1 of the survey ("knowledge and background") indicated relatively little use of computers by the teachers. Although 76% indicated that they knew how to use computers, 93% had no computers in their classrooms and 89% did not use computers to teach foreign language. Only one teacher used computers more than once a week to teach foreign language. Further, 63% of the teachers indicated that they had no prior experience in using CAI for learning or other purposes, 31% had some experience, while only 6% had extensive experience. Concerning software, 64% of the teachers were not familiar with any foreign language programs. Those who had familiarity cited such programs as "Hangperson," "Un Repas Français," and "Basic Vocabulary Builder" as examples. Several responded that they had heard about programs in magazines and conferences but could not recall the names. None of the teachers knew the meaning of CALICO (Computer-Assisted Language Learning and Instruction Consortium).

Attitude Ratings

Table 1 summarizes the results for the 10 items (Part 2) to which teachers reacted on a five-point scale (e.g., "strongly disagree" = 1; "strongly agree" = 5). Almost two-thirds of the respondents (63%) agreed that computer programs are well-suited for providing drill-and-practice, whereas close to half either agreed or strongly agreed that computer programs are well-suited for simulation in foreign language (52%) and for tutoring (46%).

The most positive reactions on the survey (over 89% agreement) were to the idea that foreign language practitioners should learn how to use computers. Also, from 65 to 80 percent agreed with the statements

Table 1. Teacher Responses to the Attitude Survey (a)

Item	Response Category					M(b)
	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	
1. Courseware provides drill and practice in FL	2	0	35	39	26	3.85
2. Courseware is well-suited for simulation in FL	2	6	41	39	13	3.56
3. Courseware is well-suited for tutoring in FL	4	11	39	32	15	3.45
4. FL teachers should learn how to use computers	0	0	11	64	26	4.15
5. Computers help teachers achieve FL instructional goals	2	4	34	45	15	3.68
6. Like computers in class to teach a FL	0	4	18	44	35	4.09
7. Computers are more of help than inconvenience	0	4	31	36	29	3.91
8. Computers are as important in FL as other subjects	0	4	29	35	33	3.96
9. A FL lab is more valuable than a computer lab	6	30	41	13	11	2.94
10. Computers will have a great impact on FL in the future	0	6	38	34	23	3.74

(a) Responses are represented as the percentage of teachers (total n=54) selecting each response.

(b) Means were derived by assigning numerical values from 1-5 to categories: 1=strongly disagree, 5=strongly agree.

that: (a) computers help to achieve instructional goals (70%), (b) they would personally like to incorporate computers in their classrooms (79%), (c) computers would be more of a help than an inconvenience in a foreign language classroom (65%), and (d) computers are equally important in foreign classes as they are in any other course (67%).

A further reflection of the generally favorable attitudes toward computers was that more respondents disagreed (35%) than agreed (24%) with the statement that it is more valuable to have a foreign language lab in their schools than to have a computer lab. The final question focused on the impact that computers are likely to have in the future. Although 38% of the teachers surveyed were unsure about this matter, 55% *strongly* agreed that computers will produce changes in language instruction, a response that suggests some optimism regarding the impact of computer technology in foreign language education.

A series of *t*-tests for independent samples were performed to analyze differences between attitude ratings by older (> 28 years; $n=30$) and younger (< 29 years; $n=23$) teachers. The only difference that approached significance ($p < .06$) was in reaction to the desirability of having a foreign language lab versus a computer lab (Item 9). Surprisingly, the younger teachers tended to be less supportive of the computer lab (Mean = 3.26) than were the older teachers (Mean = 2.70). Another series of *t*-tests compared reactions by Spanish teachers ($n=31$) and French teachers ($n=15$). The only significant difference occurred on Item 10: Spanish teachers were more positive (Mean = 3.87) about the future impact of computers on foreign language teaching than were the French teachers (Mean = 3.27), $t = 2.24$, $p < .03$.

In a final series of *t*-tests, teachers who had experience using computers ($n=20$) were compared to inexperienced teachers ($n=34$). The only significant difference occurred on

item 8: experienced teachers were more positive (Mean = 4.30) than were inexperienced teachers (Mean = 3.73) about the importance of using computers in foreign language relative to other subjects, $t = 2.38$, $p < .05$.

Open-ended Responses

On the open-ended section of the survey, drill-and-practice was most frequently ($n=20$) cited as an advantage for using computers in foreign language classrooms. Enrichment was the second most frequently cited benefit ($n=10$), followed by individualized instruction ($n=9$), allowing students to work at their own pace ($n=8$), and reinforcement ($n=4$). Other advantages cited included using computers for extra-credit, freeing teachers from grading papers, simulations, testing, increasing vocabulary, enhancing grammar skills and composition, helping absent students to make up their work, and facilitating record-keeping and test preparation.

Disadvantages were identified as the absence of oral input ($n=11$), the presently limited number of computers and software ($n=10$), the cost of hardware and software ($n=5$), and lack of knowledge about using computers ($n=5$). Isolated comments referred to the lack of time for combining CAI with the curriculum demands and the lack of human interaction.

INTERVIEW RESULT

Why computers are not used

In response to the interview question about why computers are not used extensively in foreign language, teachers cited the cost of the equipment, the limited access to computers, and teachers' lack of knowledge of how to operate the machines. Other comments noted the higher importance of actually seeing and hearing people using the language. The only teacher who regularly used the computer for teaching (in a Spanish course) was pessimistic about the

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present situation, saying: "There are no materials compared to other subjects, such as math and English. It is also difficult to find programs. Price is a major factor and programs cannot be reproduced." A young female instructor pointed out that foreign language teachers are obligated to follow the curriculum guide, which does not leave enough time to do other activities.

How computers would be used

Most of the teachers agreed that they would use computers to reinforce grammar, teach vocabulary, provide drill-and-practice, and provide tutoring. The Spanish teacher who regularly used computers did so for vocabulary and drills, employing a program called "Quick Flash." Another teacher commented that she would use computers to teach her subject if she had the equipment and knew what to do.

Future of computers in foreign language

The teachers agreed that the future of CAI will largely depend on the availability of computer programs with voice and accent capabilities. If speech synthesizers became more common, they could be used for oral practice. One experienced computer teacher projected that computers will be used instead of tapes in the future. He also pointed out that young people seem highly interested in this new technology. Another teacher expressed the belief that the failure or success of CAI in languages will depend on the quality of the programs. Other views were that the effectiveness of computers still remains unknown, thereby making the future uncertain. A problem foreseen by some was that, although foreign language software would increase over the years, the availability of the software and hardware in foreign language classes would remain limited in public schools due to the cost of the programs.

CONCLUSIONS

The teacher participation rate in the study was relatively high, with 55 out of the 66 teachers who were contacted (85%) returning completed surveys. This final group represented close to 40% of the total population of junior-high and high-school language teachers in the school system. Further, all 10 teachers who were requested to be interviewed complied, a 100% participation rate. Based on these outcomes, the sample is considered representative of the overall population of foreign language instructors in the target school system. Although conditions in other states or regions may differ somewhat from those in the present system, the results should have reasonable generalizability to urban schools elsewhere.

As anticipated on the basis of current literature on CAI and on foreign language instruction, the findings revealed that few teachers (only 11%) made any use of computers for instruction. Although the majority of the teachers (76%) knew how to operate computers, nearly all lacked access to equipment (in classrooms or laboratories) and appropriate software. Teachers' knowledge about CAI was largely limited to what they had read or heard about from others. Specifically, less than 50 percent had firsthand experience with CAI and only one-third had any familiarity with foreign language software. The clear impression obtained is that the schools concerned provided very limited computer resources and virtually no teacher training.

A second research question concerned teachers' attitudes about CAI. Given the limited personal experiences of the teachers in using CAI, it was expected that many would react negatively as a rationalization to justify their lack of involvement. In direct contrast, the majority of teachers expressed quite positive views. They perceived

computers as potentially helpful tools for teaching foreign language and other subjects. Most impressively, close to 90% of the sample supported the notion of foreign language teachers learning to use CAI, whereas close to 80% wanted computers to be available for teaching their own classes. The overall attitude conveyed was one of being receptive to CAI rather than being threatened by it. Of the different language groups surveyed, Spanish teachers appeared most confident about the future impact of CAI on foreign language teaching. Perhaps those teachers recognize that Spanish is becoming the second most widely used language in the Western Hemisphere, spoken in many countries that use advanced technology to improve their progress and economy.

Consistent with Pusack's (1983) views on effective CAI strategies for teaching foreign language, the teachers identified drill-and-practice of vocabulary as the main advantage of CAI. Immediate feedback, reinforcement, and enrichment were all considered attributes of CAI from which students could benefit. On the other hand, consistent with Larsen's (1987) concern about computers' limitations for teaching speaking and listening skills, inability to provide adequate oral input was identified as the most important disadvantage. Some of the teachers anticipated the advent of more advanced technology that would provide "human-like" voice synthesis. Immediate problems that were perceived as restricting a broader usage of CAI concerned the limited amount of hardware and software in public schools and the computer illiteracy of many classroom teachers.

With regard to the implementation of CAI, none of the schools in which the present teachers taught had adopted computers in the language curriculum. Thus, although computers have become increasingly pervasive in schools, reaching an estimated 1.2 to 1.7 million by 1988 (Sutherland 1990), it appears from the present results that

subjects other than foreign language are the primary beneficiaries.

To the extent that the present results are generalizable to other school systems, limited software and hardware availability, not resistance to technology, appears to comprise the major barrier to the integration of computers in foreign language classes. Foreign language teachers, however, need to become better informed about computers so that they can identify potentially effective uses and exercise a stronger voice in requesting computer resources from their schools. Because CAI is less recognized and established in foreign language than in other subjects, school administrators may be inclined to overlook foreign language classes in allocating hardware and purchasing software. One way of increasing computer literacy is for teachers to read journals such as CALICO and other computer publications that are oriented toward foreign language instruction. Additional ways are obtaining ideas from teachers who are using CAI, and participating in relevant inservice training where available. Continuing advances in technology and in models for integrating computers into school environments paint a bright picture of the future of educational computing (Newman 1990). Foreign language teachers and students will obviously be in a better position to enjoy that future through the initiation of broader, more extensive applications of educational computing in today's classrooms.

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