

Technology-Mediated Learning 10 Years Later: Emphasizing Pedagogical or Utilitarian Applications?

Nike Arnold

University of Tennessee, Knoxville

Abstract: *In recent years, educational technology has come a long way. Technological advancements and significant investments in computer equipment and training have opened new opportunities for foreign language teachers. In addition, instructional technology (IT) is now an accepted component of teacher training and foreign language teaching. This study addresses the question how IT actually is being used for foreign language learning in higher education. It reports the findings of an online survey, which was completed by 173 college foreign language teachers. Results suggest that the vast majority of participants do use computer technology for their teaching, but at a very basic level. Teachers' IT use seems to be motivated largely by utilitarian reasons, followed by a variety of pedagogical benefits.*

Key words: *computer-assisted language learning, foreign language teaching, higher education, instructional technology*

Language: *Relevant to all languages*

Introduction

In 1995, an investigation into the state of technology-mediated learning at U.S. colleges and universities concluded with a rather bleak assessment of the situation at the time, but provided a rosy prognosis for the future (Cotton, 1995). Over a decade later, it is time to reassess the use of instructional technology (IT): How far has IT come in the last 10 years?

This article is based on this fundamental question and investigates how computer technology is used in higher education for foreign language learning. It reports the findings of an online survey, which was completed by 173 foreign language teaching assistants (TAs), lecturers, adjuncts, and faculty at multiple universities in the southeastern United States. The study's results provide insights into the use of various computer applications in different kinds of foreign language courses and sheds light on why teachers decide for or against the use of IT.

Nike Arnold (PhD, University of Texas at Austin) is Assistant Professor of German at the University of Tennessee, Knoxville, Tennessee.

Review of the Literature

Educational Technology and Its Place in Foreign Language Teaching

Not only is technology now regarded as deserving a place in foreign language teaching, it is often considered a vital component. The INTASC (Interstate New Teacher Assessment and Support Consortium) Standards (Council of Chief State School Officers, 2002), for example, mention technology in connection with several of its nine standards for licensing new teachers: in principle 4: instructional strategies, principle 6: communication, and principle 9: reflective practice and professional development. These standards reflect the belief that technology should play an important role in foreign language teaching, which means that language teachers are expected to remain up to date with IT in order to enhance their teaching with appropriate educational applications.

There are similar expectations in higher education, where many institutions consider IT a high priority (Zemsky & Massy, 2004) and search committees often look for an applicant's ability to incorporate new technologies into his or her teaching (Broughton & Conlogue, 2001; Glew, 2000). Among other things, administrators and faculty value IT because students and parents have come to expect the use of technology in college classes (Goldfield, 2001; Lea, Clayton, Draude, & Barlow, 2001; Young, 2004).

Foreign language departments in particular seem to place a lot of importance on technology because it offers unique opportunities to enhance instruction (e.g., by exposing students to authentic language and cultural materials). In a 2002 document, the Modern Language Association stated that "information technology is critical to fulfilling the educational and research missions of modern language departments" (2002b, paragraph 1). Such expectations are also reflected in the checklist for self-study for departments created by the Association of Departments of Foreign Languages (ADFL, 2001). Compiled in

2001, one criterion for evaluating departments of foreign languages and literatures is the extent to which they are involved in computer-assisted instruction.

The State of IT Use

But what is the actual status quo of teaching with technology? While IT budgets have dropped in recent years (Kiernan, 2005), U.S. colleges still spend a considerable amount of money on technology. In 2005, colleges and universities spent an estimated \$2.4 billion on hardware, \$1.3 billion on software, and \$242 million on training (Kiernan, 2005). The cuts in IT budgets do not, however, indicate a decline in the value colleges place on IT. Instead, this trend reflects often austere college budgets and the progress made in recent years, which allows colleges to scale back on their fiscal investments in technology (Kiernan, 2005). In 2001, the CEO Forum on Education and Technology reported a similar status quo at American K–12 schools, where significant progress has been made toward building a technology infrastructure. With a technology infrastructure in place at many American schools and universities, teachers now seem to have the necessary equipment to incorporate computers into their instruction.

In recent years, institutional and national surveys have provided statistical data about the general use of IT in schools and universities. A national survey found that in 2000, 76% of public school teachers used computers daily for planning or teaching and 63% used the Internet for instructional purposes (CEO Forum on Education and Technology, 2001). But in their survey of 659 K–12 teachers, Rakes and Casey (2002) cautioned that despite training and the availability of equipment, many school teachers remain uncomfortable with the use of computers; they concluded that the institutionalization of IT has not taken place yet.

At the college level, IT use has been on the rise since 1994 (Green, 2000). A

national survey conducted in 1998 reported that between 34% and 40% of faculty used course-specific Web sites to post homework or other class information and provide links to additional sources of information (National Center for Education Statistics, 2002). Since 1998, there have been several projects investigating the use of IT at individual institutions. A 2000 faculty survey at Middle Tennessee State University, for example, found that most participants were skilled in the use of basic applications (e.g., e-mail, presentation software) and that 40% frequently used supplemental technology materials. A similar study at the City College of San Francisco (2003a) reported that 51% of instructional faculty used materials they found on the Internet. In 2004, a longitudinal study conducted at six universities reported widespread use of the Internet (91% of surveyed faculty required students to use Web-based materials), but other applications, such as electronic discussions (used by only 57% of faculty), lagged behind considerably (Zemsky & Massy, 2004).

These studies show that many college teachers have adopted IT, but their use of it is often limited to very basic tools like the Internet or PowerPoint. It is questionable if such kinds of technology implementation can be considered computer-mediated learning—rather, they seem to fall into the category of computer-assisted instruction. But alarmingly, faculty members often consider their use of PowerPoint or the Internet to be innovative technology (Carnevale, 2004). Consequently, some people feel that “overall the experience with e-learning has been disappointing” (Zemsky & Massy, 2004, p. 57) and that we have not reaped much benefit from the considerable investments made in technology (Carnevale, 2004).

Students are also very critical of unsuccessful uses of technology in the classroom, such as malfunctions due to unfamiliarity with the technology or the ineffective use of PowerPoint presentations (Young, 2004). As one student put it: “If you’re

going to attempt to use technology, either use it right or don’t use it at all” (Young, 2004, p. 31).

Reasons for and Barriers to the Use of Educational Technology

Foreign language teachers have reported using computer technology to advance their students’ learning processes (Demetriadis, Barbas, Molohides, Palaigeorgiou, Psillos, Vlahavas, et al., 2003; Egbert, Paulus, & Nakamichi, 2002), present language in a natural and authentic context (Lam, 2000), connect with native speakers and the target culture (Egbert et al., 2002), motivate students (Egbert et al., 2002; Ertmer, Addison, Lane, Ross, & Woods, 1999; Lam, 2000), and bring variety into lessons (Lam, 2000). More utilitarian reasons, which can influence all teachers, not just those who teach foreign languages, include: to improve the teacher’s professional profile (Demetriadis et al., 2003), to teach students important technical skills for the future (Egbert et al., 2002; Ertmer et al., 1999), to respond to outside pressure (Martins, Steil, & Todesco, 2004), and to simplify tasks to speed up work (Lam, 2000). Administrators, on the other hand, might have additional reasons for favoring the implementation of IT, such as improving the accessibility and efficiency of their institution (Wilson, 2003).

While there are many reasons for using IT, there are also factors that hinder or even prevent its implementation in foreign language classes as well as other courses. Green (2000) lists several persistent problems with IT at colleges and universities, and the situation at schools appears similar. So-called “first-order barriers” (Ertmer et al., 1999, p. 66) are often mentioned by teachers: lack of equipment and resources, time, and support or help (Butler & Sellbom, 2002; Egbert et al., 2002; Ertmer et al., 1999; Wilson, 2003). In addition, lack of training or the time it takes to get trained are also important barriers (Butler & Sellbom, 2002; Lam, 2000). Referring to these problems, Al-Bataineh and Brooks (2003) note that “even as technology use

and application advances at an almost logarithmic pace, many of the issues related to technology use remain remarkably constant" (p. 473).

Apart from these general concerns, which are similar to those of other technology users (City College of San Francisco, 2003b), teachers in different fields have reported other problems, such as: reliability issues (Butler & Sellbom, 2002; Goldfield, 2001), lack of reward (Wilson, 2003), and skepticism about the pedagogical value of IT (Butler & Sellbom, 2002; Goldfield, 2001). It is interesting that these concerns are not influenced by a teacher's technological proficiency (Butler & Sellbom, 2002).

A Fragmented Picture

The information reported in the previous sections of this article has provided a general picture of the use of IT. In recent years, the following types of studies have contributed to our understanding of how and why computers are used in classrooms:

1. small, often qualitative studies (e.g., Egbert et al. 2002; Ertmer et al., 1999; Lam, 2000)
2. surveys conducted at individual colleges and universities (e.g., Butler & Sellbom, 2002; City College of San Francisco, 2003a; Middle Tennessee State University, 2002)
3. larger-scale surveys of higher education (e.g., National Center for Education Statistics, 2002; Zemsky & Massy, 2004)
4. studies focusing on primary and secondary education (e.g. Baylor & Ritchie, 2002; Ertmer et al. 1999; Meskill, Mossop, DiAngelo, & Pasquale, 2002; Rakes & Casey, 2002)
5. studies conducted with teachers from different teaching levels (e.g., Egbert et al., 2002; Lam, 2000)
6. studies specifically investigating the use of the Internet (e.g., Fidelman, 1998; Murphy, 2002)

Unfortunately, very little detailed information is available specifically about the use of IT for foreign language learning (Egbert et al., 2002; Lam, 2000; Murphy, 2002). In addition, none of these studies focused on the postsecondary setting. Consequently, we have only a fuzzy picture of how technology is used in foreign language teaching at U.S. colleges and universities.

The Study

Methods

This study was designed to fill the gap in information about how foreign language teachers¹ currently and actually use technology. While other studies have included administrative uses of technology, such as for lesson planning, electronic communication with students, or grade management (e.g., Butler & Sellbom, 2002; CEO Forum on Education and Technology, 2001; City College of San Francisco, 2003a; Egbert et al., 2002), this study focuses on the use of IT. Here, IT is operationalized as the use of computer technology for the purpose of foreign language learning that directly involves the student.

This study sought to answer the following research questions:

1. How frequently do college foreign language teachers integrate computer technology for language learning purposes?
2. Which demographic factors are related to a teacher's level of IT use (e.g., age, teaching experience)?
3. Which types of computer applications do they use and how often?
4. How is IT used in different kinds of foreign language classes (e.g., literature classes, lower-division language courses)?
5. What reasons do college teachers report for using IT?
6. Which factors do foreign language teachers perceive as barriers toward the implementation of IT?
7. Do TAs and faculty report different motivations and barriers?

For this study, foreign language teachers from selected colleges and universities in Alabama, Florida, Georgia, Kentucky, South Carolina, and Tennessee were invited to complete an online survey (see Appendix A). These six states were chosen to represent the southeastern United States. Institutions that met the following criteria were selected to be included in this study: (1) they were located in one of the U.S. states listed above, (2) they were a four-year institution, (3) their inclusion helped achieve a balanced representation of private vs. public and small vs. larger universities and colleges, and (4) they had a Web site with easily accessible e-mail listings of teaching personnel. Teachers at the selected institutions were asked to participate in this study if they met these criteria: (1) they were TAs, lecturers/instructors, or faculty of modern foreign languages, and (2) their e-mail addresses were listed on the university or college Web site. The researcher sent an e-mail to more than 1,200 teachers inviting their participation in this study, which consisted of the completion of an anonymous Web survey.² One hundred seventy-three teachers completed the survey, which constitutes a response rate of 15% (this rate does not account for undelivered notification e-mails).³ Despite two e-mail reminders, the response rate remained low, even for an electronic survey, a format that tends to get considerably lower response rates than other forms of delivery (Yun & Trumbo, 2000).

Participants

The participants represented 32 different four-year institutions in all six states (Alabama: 6; Florida: 4; Georgia: 4; Kentucky: 5; South Carolina: 5; Tennessee: 8). The largest group of participants taught at public (75%) institutions with an enrollment of more than 25,000 students (36%).

The first section of the survey provided the following demographic information: The study's participants were predominantly female (72%) and ranged in age from 22 to 74 years, with most (34%) being in their

30s. Participants' foreign language teaching experience displayed a similarly broad range, from 1 to 52 years, but most teachers had 1 to 5 or 11 to 19 years of experience (23% each). Faculty represented the largest group (43%), followed by nontenure-track teachers (e.g., lecturers, visiting assistant professors (36%), and TAs (22%). The respondents taught a variety of target languages:⁴ most of them taught Spanish (41%), followed by French (32%) and German (19%). Other romance languages (i.e., Italian, Portuguese), Japanese, and Russian ranged from 2% to 5% each. Only 1 participant each taught Arabic or Chinese. This distribution reflects current foreign language enrollment trends at U.S. institutions of higher education, where Spanish is most popular, followed by French, German, and Italian (Modern Language Association, 2002a).

Instrument and Data Analysis

The online survey was divided into several sections. The first section was designed to collect demographic information about the respondents and their institutions. The next section pertained to the use of specific applications in the following types of foreign language classes: first- and second-year language, upper-division language, language for specific purposes (e.g., Business German), culture, film, literature, pedagogy/teacher training, applied linguistics, and linguistics. If a respondent had taught a specific kind of course in the fall semester of 2004 or spring semester of 2005 (e.g., "Do you currently teach a film course or have you taught one in the last semester?"), he or she was asked to describe the use of different applications (e.g., "Please describe how you have typically used technology directly for your teaching in your film course(s)."). Using a 4-point Likert-scale, respondents rated their use of the following activities as weekly, once or twice a month, once or twice a semester, or never: (1) online assessment, (2) student participation in a discussion board, (3) posting materials online, (4) exposing students to

Weblogs, (5) student creation of Weblogs (6) students visiting specific Web sites, (7) students searching the Internet, (8) student creation of a Web site, (9) student participation in a listserv, (10) exposing students to a listserv, (11) student participation in MOOs,⁵ (12) student creation of digital audio files, (13) student creation of digital video files, (14) exposing students to digital video files, (15) exposing students to digital audio files, (16) student participation in videoconferences, (17) students working with content software programs, and (18) student participation in synchronous chat/synchronous messaging.

Finally, participants were asked which factors motivated them to use IT and which factors functioned as barriers. They rated a list of factors on a 5-point Likert scale according to how much influence they had on their decision, if any. In addition, the survey included questions about course-managing software (e.g., WebCT, Blackboard), in-class use of technology, and respondents' experience learning with computer technology. At the end of the survey, a comment box allowed participants to make open-ended comments. For the data analysis, descriptive statistics such as means and frequencies were used to describe data distributions. For the second research question, correlational procedures were necessary to establish relationships between variables. In addition, significant differences tests such as *t* tests, one-way ANOVAs, repeated measures, and MANOVAs were performed to be able to draw conclusions about the sample-specificity of the findings.

Results and Discussion

Research Question 1: How Frequently Do College Foreign Language Teachers Integrate Computer Technology for Language Learning Purposes?

In the two semesters covered by this survey, 99% of participants had used at least one type of computer application at least once or twice a semester. That is an astonishingly high number, especially compared with Egbert et al.'s (2002) finding that

70% of their participants used at least one computer-supported activity. The present study's higher number is even more surprising considering that Egbert and her colleagues interviewed only teachers with previous CALL (computer-assisted language learning) training, which was not the case for this study. However, some caution is warranted when comparing the two studies since they did not survey the same kinds of applications.

For greater insight into teachers' overall IT use, a mean was calculated for each respondent. First, the frequencies of use of all applications (e.g., average use of searching the Internet or exposing students to digital audio files) within each type of class were added up. Then, an average was calculated across all class types. These means are based on a 4-point Likert scale, which was coded as follows: 0 = never, 1 = once or twice a semester, 5 = once or twice a month, 10 = weekly. Unlike the consecutive coding typically used for Likert scales, these values balance for the time distance between frequencies (e.g., once or twice a month is about five times as frequent as once or twice a semester). In addition, values of 0 were excluded from this calculation to avoid distorting the picture.⁶

Possible values for the overall mean IT use ranged from 0 (i.e., no use of any applications) to 180 (representing the weekly use of all 18 surveyed applications, which is rather unrealistic). As expected, participants' overall mean IT use did not cover the whole range and instead ranged from 0 to 106.5. The average was in the lower part of the range: $M = 27.64$. This indicates that, on average, participants used about three different applications on a weekly basis or five applications once or twice a month.

As shown in Figure 1, the majority of participants (23%) had an overall mean technology use between 21.00 and 30.99—they incorporated two to three applications into their teaching on a weekly basis (or four to six as frequently as once or twice a month). The next largest group (19%) fell into the mean bracket of 11.0 to 20.99.

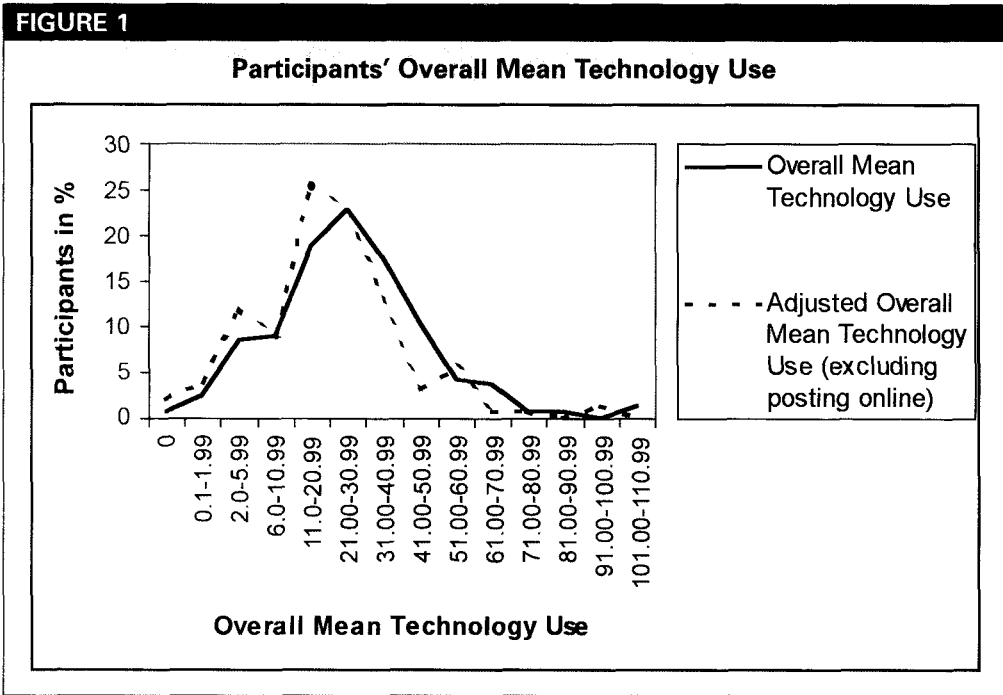


TABLE 1

The Relationship Between Overall Mean Technology Use and Demographic Variables

Variable	Value	N	M	SD	Analysis	
Gender	male	46	24.801	19.701	two-tailed indep. sample t test	t(162) = 1.174 p = .242
	female	118	28.755	19.258		
Institution	private	40	32.767	16.225	two-tailed indep. sample t test*	t(161) = 2.188 p = .032
	public	123	25.888	20.153		
	15,000 or less	46	33.458	2.857	ANOVA	f(2, 156) = 3.057 p = .050
	15,001 to 25,000	55	26.888	2.613		
	25,001 or more	58	24.139	2.544		
Learning w/ Tech	yes	108	29.125	18.306	two-tailed indep. sample t test	t(158) = 1.345 p = .180
	no	52	24.683	21.962		
FL Teaching Experience	1 to 52 years	163	15.30	10.749	correlation	r = -.117 p = .145
Age	22 to 74 years	164	42.26	12.219	correlation	r = -.161 p = .044
Position	TAs	33	32.179	3.409	ANOVA	f(2, 157) = 1.203 p = .303
	nontenure-track faculty	58	27.385	2.572		
	faculty	69	25.778	2.358		

* Equal variances not assumed

These numbers suggest that many college foreign language teachers make considerable use of IT.

Since this study focuses on the use of computer technology to promote language learning, posting materials on the Web might not match this operational definition. Therefore, an adjusted mean was calculated excluding this application. As a result, the data distribution changed only slightly (see Figure 1). The number of nontechnology users, for example, rose only slightly from 0.6% to 1.9%.

Research Question 2: Which Factors Are Related to a Teacher's Level of IT Use?

To determine if foreign language teachers' IT use differs based on demographic variables, correlations were run on continuous data (i.e., age, foreign language teaching experience). Two-tailed ANOVAs (i.e., position, enrollment) and independent sample *t* tests (i.e., gender, public/private institution, experience learning with technology) were used for categorical data. These analyses tested each demographic variable separately and used the unadjusted overall mean technology use, which included all surveyed applications (i.e., including posting materials online).

As Table 1 indicates, the type of institution (i.e., enrollment, public/private) did play a role. Teachers at private institutions ($M = 32.77$) used IT significantly more often than their colleagues at public schools ($M = 25.89$). The size of the college also played a role.

Of the personal demographic variables, gender revealed no significant difference on the dependent variable, overall mean technology use. Surprisingly, there was also no connection between overall mean technology use and the variables position, foreign language teaching experience, and experience learning with technology. This seems at least partially to contradict other studies, which have reported that teachers are more likely to use IT if they are experienced (Egbert et al., 2002) and have

themselves learned with technology (Lam, 2000). It is possible that these two variables are connected (e.g., an experienced teacher has been out of training for several years, which could result in few opportunities to learn with IT and consequently a lower IT use), but this study was designed to establish only simple relationships between IT use and individual demographic variables.

There was, however, a negative correlation between age and overall mean technology use, meaning that the older the participant, the lower his or her overall mean technology use. This finding is especially interesting considering that there was a correlation between age and teaching experience ($r = .83, p < .001$), but of these two variables only age was correlated with technology use. Thus, technology seems to be a generational issue rather than an issue related to teaching experience. Younger teachers, who grew up in a world where technology is integral to many daily activities in peoples' work and private lives, seem more comfortable using IT.

Research Question 3: Which Types of Computer Applications Do College Foreign Language Teachers Use Most Often?

Mean values were calculated for the participants' use of 18 different IT applications to determine which were used more frequently. The data are based on the same 4-point Likert frequency scale explained earlier. As displayed in Table 2, the three most commonly used applications are posting materials online, sending students to specific Web sites, and having students search the Internet (5.39, 4.16 and 3.47 respectively). This indicates that survey participants posted online materials on average more than once or twice a month (represented by a value of 5). Other studies also have reported the popularity of Web-based materials and activities among teachers at all teaching levels (CEO Forum on Education and Technology, 2001; City College of San Francisco, 2003a; Zemsky & Massy, 2004).

TABLE 2

Overall Mean Use of Surveyed IT Applications

Application	M	SD
Post materials online	5.388	4.081
Send students to specific Web sites	4.058	3.551
Have students search Internet	3.471	3.356
Content software	2.999	4.011
Expose students to digital audio files	2.756	3.544
Online assessment	2.747	3.754
Expose students to digital video files	1.527	2.765
Have students participate in discussion board	1.342	2.706
Expose students to listserv	0.793	2.246
Have students participate in chats	0.693	1.938
Have students participate in listserv	0.656	2.204
Have students create digital audio files	0.403	1.371
Expose students to Weblogs	0.398	1.369
Have students create Web site	0.170	0.868
Have students participate in Weblogs	0.123	0.639
Have students create digital video files	0.096	0.388
Videoconferencing	0.022	0.199
Have students participate in MOOs	0.008	0.082

Applications with significant differences in average use are divided by horizontal lines.

Working with content software ($M = 2.999$) and exposing students to digital audio files ($M = 2.76$) are in positions four and five, followed by online assessment ($M = 2.75$). MOOs ($M = 0.01$), videoconferencing ($M = 0.02$), and the student creation of blogs ($M = 0.12$), video files ($M = 0.10$), or Web sites ($M = 0.17$) were used only very rarely. It is interesting to note that the least frequently used IT applications are the ones requiring a considerable amount of time from both the teacher and the students.

A repeated measures ANOVA ($f(17, 127) = 22.374, p < .001$) revealed significant differences in the use of IT activities. As shown in Table 2, a pairwise comparison indicated that the use of the two most popular applications, online posting and directing students to specific Web sites, is

significantly higher than that of other IT activities.

Research Question 4: How Is IT Used in Different Kinds of Foreign Language Classes?

Participants were asked which classes they were currently teaching and had taught in the previous semester and how frequently they used different applications in these classes. In the two semesters covered by the survey, participants taught the following classes: first/second-year language: 79% of participants, upper-division language: 42%, literature: 30%, culture: 23%, language for specific purposes (e.g., Business German): 16%, film: 8%, pedagogy/teacher training: 7%, linguistics: 5%, and applied linguistics: 5%.

Overall, culture courses used the most IT ($M = 35.80$), followed by lower-division language courses ($M = 31.26$) and pedagogy classes ($M = 27.25$) (see Table 3). Teachers might include IT in their culture classes because it provides many unique opportunities to connect with the target culture and its people. In lower-division language courses, IT use might be facilitated by textbooks, which often integrate technology (e.g., Internet activities) and provide teachers with many resources for the use of IT. In pedagogy courses, teachers might incorporate IT to demonstrate to future teachers how computer technology can be used to support teaching. In fact, everybody in the survey who was teaching a pedagogy or lower-division course used IT at least once or twice a semester, while some teachers of other classes never used IT. Due to the small number of observations for some class types (e.g., applied linguistics), however, it was not possible to test for significant differences.

There were some general trends in the use of specific applications in these courses, which mirrored the findings for the third research question. Overall, posting materials online and Internet activities were among the three most frequently used applications in all courses. In lower-division courses, however, content software and exposing students to online audio files were also very popular, but online searches ranked only sixth. Due to students' limited linguistic abilities, lower-division teachers probably prefer tasks designed for specific Web sites to guide their students and not overwhelm them.

Research Question 5: Which Reasons Do College Teachers Report for Using IT in Foreign Language Classes?

In the last part of the survey, participants were presented with a list of 16 potential reasons for using IT. Using a 5-point Likert scale, they indicated how much influence these factors had on their technology implementation (1 = not a factor, 5 = important factor).

Overall, the present study confirmed the complex picture of motivations for using IT presented by other studies (e.g., Demetriadis et al., 2003; Egbert et al., 2002; Ertmer et al., 1999; Lam, 2000; Martins et al., 2004). Participants of the present study reported many important factors in their decisions to use technology. As presented in Table 4, 11 out of 16 surveyed factors received an average above 3, indicating a moderate to strong influence on teacher behavior. The single most important reason for teachers' IT use is student convenience ($M = 3.87$). Obviously, many teachers cater to their students' expectation that computer technology is supposed to provide convenience (Zemsky & Massy, 2004). Another utilitarian reason, teacher convenience, was also an important factor and ranked seventh ($M = 3.49$). This attitude also was reflected in some of the comments made by the participants. One of the teachers stated: "I see convenience as the main benefit of incorporating computer technology into the classroom."

Participants also cited pedagogical reasons for using technology. The most important reasons included: to bring variety into a lesson ($M = 3.78$), to connect students to the target culture and/or language ($M = 3.71$), to advance students' learning ($M = 3.66$), and to motivate students ($M = 3.64$). Outside factors such as colleagues, supervisors, journal articles, and presentations played only a small role. This might indicate that college teachers are under less pressure from supervisors or administrators to use IT than school teachers.

An analysis of the open-ended comments revealed interesting insights into how many foreign language teachers view the role of IT. Several participants expressed the belief that technology should be used only as a supplement, which is reflected in the following comment: "Computer technology should be understood and used as an *additional* tool to in-class instruction in language and culture teaching, *not* as a replacement for it." Lam (2000) also

TABLE 3

**Means for the Use of IT Applications in Different Kinds
of Foreign Language Classes**

	1 st /2 nd Year Language Course	Upper Division Language Course	Language for Specific Purposes	Culture Course	Film Course	Literature Course	Pedagogy/Teacher Training Course	Applied Linguistics	Linguistics Course
Mean Tech Use:	31.26	27.00	25.79	35.80	18.08	18.23	27.25	21.43	9.75
SD	20.32	23.15	23.90	26.01	17.73	16.30	25.20	20.46	10.50
Posting material online	5.37	5.16	4.38	7.30	3.54	4.90	4.43	5.00	3.56
Students visit specific Web sites	4.21	4.38	4.72	6.43	4.00	3.58	5.21	3.75	1.00
Students work w/ content software	4.43	1.96	2.71	2.25	0.08	1.15	1.00	1.88	0.00
Expose students to online audio files	3.75	2.33	2.32	2.78	1.00	0.71	0.93	0.63	0.78
Online assessment	3.64	1.96	2.03	2.24	0.08	0.86	1.79	0.63	0.78
Expose students to online video files	1.84	1.78	1.14	2.69	1.83	0.53	0.50	1.25	0.63
Students find info on the Internet	3.06	5.26	4.52	5.65	2.77	4.16	3.21	3.88	2.67
Expose students to Weblogs	0.46	0.50	0.72	0.36	0.00	0.10	0.79	0.00	0.11
Have students create Weblogs	0.10	0.12	0.45	0.03	0.00	0.00	0.71	0.00	0.00
Have students create a Web site	0.09	0.38	0.10	0.33	0.08	0.34	0.21	0.63	0.00
Students participate in MOO	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Students create digital video	0.09	0.04	0.07	0.13	0.17	0.02	1.07	0.13	0.00
Videoconferencing	0.01	0.01	0.00	0.00	0.00	0.02	0.23	0.13	0.00
Students participate in chat	0.79	0.92	1.07	0.98	0.38	0.24	1.14	0.63	0.00
Online discussion	1.23	1.61	1.31	2.10	2.00	1.08	2.21	0.00	0.00
Have students participate in a listserv	0.73	0.39	0.93	1.43	1.54	0.41	0.71	0.13	0.67
Expose students to listservs	0.77	0.85	0.93	0.87	0.92	0.24	1.86	1.25	0.67
Students create digital audio files	0.58	0.48	0.07	0.33	0.00	0.00	0.07	1.38	0.00

The three most popular applications in each course are in bold.

TABLE 4**Mean Scores for the Reasons of Technology Implementation**

Reason	M	SD
For my students' convenience	3.87	1.415
To provide a change of pace or variety	3.78	1.410
To connect students to the target culture and/or its people	3.71	1.547
To advance students' learning processes	3.66	1.405
To motivate students	3.64	1.518
To give students an opportunity to apply their knowledge	3.50	1.488
For my convenience	3.49	1.549
To individualize instruction	3.40	1.548
To get every student involved	3.38	1.601
To accommodate different learning styles	3.31	1.647
To foster communication among students in my class	3.07	1.547
To equip students with important technical skills for the future	2.97	1.498
External forces (e.g., supervisor, dept.) urged teachers to use IT	2.83	1.629
Colleagues recommended it	2.40	1.411
To connect my students to other learners or experts in the U.S.	2.11	1.381
I was inspired by an article/conference presentation	2.04	1.300

Factors with significant differences are divided by horizontal lines.

reported that teachers often regard IT as playing a supporting role.

A repeated measures ANOVA was used to establish any significant differences between the reasons for using IT: $f(15, 132) = 19.893, p < .001$. Pairwise comparisons showed that the top three reasons for using IT were considered significantly more important than the rest.

Research Question 6: Which Factors Do College Foreign Language Teachers Perceive as Barriers to the Implementation of IT?

Data for this research question was collected using the same format as described in the previous section. Table 5 lists the mean scores for 14 factors that might act as barriers to IT use. Time proved to be the single most important factor that keeps teachers from using IT (more often). The

time-consuming nature of the preparation ($M = 3.36$), implementation ($M = 3.21$), and evaluation ($M = 2.87$) of e-learning was noted most frequently by participants. It is curious that participants were so concerned with the amount of implementation time considering the fact that 27%, the second largest group, reported that none of their technology use for foreign language learning takes place during class time. Training and support issues also have a negative effect on IT use: teachers' lack of tech skills ($M = 2.75$), teachers' or institutions' inability to provide students with training or troubleshooting ($M = 2.34$), and lack of tech support for teachers ($M = 1.99$). Some teachers also found problematic the unreliability of the technology ($M = 2.63$) and the lack of equipment ($M = 2.46$). Other studies have reported similar barriers (e.g., Butler & Sellbom, 2002; Egbert et al., 2002:

TABLE 5**Mean Scores for Barriers to Technology Implementation**

Barrier	M	SD
Preparation too time consuming	3.36	1.543
Implementation too time consuming	3.21	1.510
Evaluation too time consuming	2.87	1.548
My own lack of tech skills	2.75	1.508
Unreliability of technology	2.63	1.335
Lack of availability of equipment	2.46	1.414
Doesn't fit my teaching style	2.39	1.497
Can't provide technical training/troubleshooting for students	2.34	1.400
I don't perceive any (vast) pedagogical benefits	2.30	1.422
Lack of applications available in my field	2.03	1.310
Lack of tech support	1.99	1.366
Lack of resources/materials available in my language	1.83	1.248
Negative feedback from students	1.82	1.147
Compatibility issues with writing system	1.48	1.072

Factors with significant differences are divided by horizontal lines.

Ertmer et al. 1999; Goldfield, 2001; Lam, 2000; Wilson, 2003).

A repeated measures ANOVA was calculated to check for significant differences between the individual factors. Since the ANOVA was significant ($f(13, 134) = 19.975, p < .001$), pairwise comparisons were used to establish which factors were significantly different from each other. Preparation time was clearly identifiable as the main barrier, followed by implementation time.

Research Question 7: Do TAs and Faculty Report Different Motivations and Barriers?

The 16 reasons surveyed in this study were included in a MANOVA, which indicated that there were significant differences based on position ($f(32, 258) = 1.893, p = .006$). Individual ANOVAs and Tukey's posthoc test revealed significant differences for only one factor: TAs ($p < .001$) and nontenure-track faculty ($p = .023$) cited external pressure

significantly more often as a motivation for the implementation of IT than did faculty (TAs: $M = 3.53$, lecturers: $M = 3.00$, faculty: $M = 2.22$). A possible explanation rests with the role of supervisors, which TAs and lecturers tend to work under more often than faculty do. Supervisors often set the curriculum for lower-division classes, which can limit teachers' instructional choices. As mentioned in the discussion of the second research question, this factor also might explain TAs' higher technology use.

A second MANOVA also revealed position differences for the barrier factors ($f(28, 262) = 2.011, p = .003$). Individual ANOVAs and Tukey's posthoc test showed that TAs were significantly less concerned with the time involved in the preparation (faculty: $M = 3.81$, TAs: $M = 2.74; p = .002$), implementation (faculty: $M = 3.66$, TAs: $M = 2.61; p = .002$), and evaluation of student outcomes (faculty: $M = 3.20$, TAs: $M = 2.34; p = .027$) of e-learning. This finding could indicate that TAs have received better IT

training, which can reduce the time it takes to prepare, implement, and evaluate a computer-mediated activity.

There are further indications that faculty's pedagogical IT training might be lagging behind. Professors are significantly less convinced of the pedagogical benefits of IT—they "still do not believe that it improves students' final product," according to a participant (faculty: $M = 2.72$, TAs: $M = 1.89$; $p = .015$).

Another possible explanation is the perception among faculty that there is no or little reward for their efforts. This attitude is illustrated in the following comment from one participant: "The use of computer technology needs to *count* for something when it comes to promotions and pay raises." This relates to the important issue of what constitutes scholarship, teaching, and service. In all three of these areas, digital media have created new opportunities that challenge academia's traditional notions; this must be reflected in universities' evaluation guidelines (Modern Language Association, 2000).

In summary, this study generated several important insights into how IT is used for foreign language learning in higher education:

1. This survey provides the following findings about college foreign language teachers' overall use of computer technology: All but 1% of participants had used computer technology directly for student learning in the last two semesters and many teachers made considerable use of IT in their teaching.
2. Data from this survey show how specific applications are used for foreign language learning. Overall, basic computer applications, whose preparation and implementation is less time-consuming than other applications, are used most often, namely Internet activities and the posting of material on the Web. These applications are among the most popular in all types of foreign language courses, from beginning language courses to advanced literature classes.
3. This study shows a pattern of age differences in the use of IT: Use by younger teachers is significantly higher than that by their older colleagues.
4. The study identifies a list of factors that, on the one hand, motivate college foreign language teachers to use IT or, on the other hand, act as barriers toward such efforts. Participant responses paint a complex picture of a variety of factors. The main reason for using educational technology is student convenience, while the demands on teachers' time serve as the strongest deterrent. It is interesting that teachers' pedagogical attitudes can act as both motivators and barriers. However, they have a stronger positive than negative influence. Again, there were significant differences between TAs' and faculty's attitudes: TAs are less worried about the time-consuming nature of IT and more convinced of its pedagogical benefits than their faculty counterparts.

Overall, the findings of this study indicate that the college foreign language teachers surveyed in this study use IT very similarly to their colleagues at the elementary and secondary levels and in other fields. One similarity is the popularity of the Internet, which teachers use for a variety of purposes. College foreign language teachers and other teachers also share the belief that technology should be used only as a tool or supplement (Lam, 2000).

The current study also revealed a utilitarian attitude toward technology: Many foreign language teachers focus on the convenience that computers can provide themselves and their students. This indicates that computer technology is often used to assist instruction rather than to promote learning—two very different approaches toward the use of technology (Garrett, 1991). While computers have many convenient uses, which should by no means be underestimated, it is important not to lose sight of their pedagogical benefits and also communicate them to students, who often

consider IT a convenience at best (Zemsky & Massy, 2004).

It is interesting that some teachers believe that technology is necessary only to manage large classes—an attitude reflected in the following comments from two participants: “There are not many students in my class and I can handle the teaching without the support of too much technology” and “I frankly don’t think it adds much in the literature classroom. Perhaps if I had larger literature classes, I would change my mind.”

Limitations and Future Research

When interpreting the findings of this study, one has to keep in mind the following limitations: Because the present survey was conducted with college foreign language teachers from only one region of the United States, its participants are not representative of the whole country. And a low number of participants taught film, pedagogy, linguistics, and applied linguistics classes. Thus, the findings reported here should not be generalized to all college foreign language teachers in the participating states or even the country as a whole. In addition, the study does not address the important issue of quality of teaching with IT.

However, this study makes an important contribution because it can help inform future research into the use of technology for foreign language learning. The data presented in this article indicate, for example, that it would be valuable for the profession to investigate how (e.g., with which learning objectives) foreign language teachers use the Internet, the most popular IT application. This would provide an even better understanding of the status quo of IT use.

In addition, this study raises several questions for future investigation: How effectively is IT used in education? How are foreign language TAs trained in the use of computer-mediated learning? How does this training affect their use of IT? Studies addressing these questions would provide important insights into the future of IT.

Conclusion

Having gained some first insights into the use of educational technology for college foreign language teaching, we can address this question again: How far has IT come? Based on the findings presented here, one can conclude that we seem to have made considerable progress: Many teachers have their students work with computer technology. However, first-order barriers, such as lack of training and equipment, still pose problems, the use of IT is often limited to utilitarian or basic applications, and some teachers question its pedagogical benefits.

Carnevale (2004) implied that educational technology has failed to deliver, which is not the case. Instead, some teachers have not yet acted on the promises of computer-mediated learning. Technology has come a long way in the last 10 years, but some teachers have not been able to keep up with and take advantage of this progress. If universities and colleges really want to promote IT, it is not enough to outfit classrooms with state-of-the-art equipment. The biggest challenge will be to find a solution for the main barrier: time.

If technology is supposed to be an effective component of classroom foreign language learning, we must ensure that it be used in the most valuable way pedagogically to justify teachers’ and students’ investment of time. Unfortunately, this study seems to indicate that this is not always the case. However, a new generation of teachers—TAs—will change how IT is used in the future. TAs appear to already be better trained in the pedagogical aspects of computer-mediated learning than faculty, and we must ensure that they continue to receive extensive training and opportunities for practical experience with a variety of innovative applications.

Acknowledgments

The author wishes to thank all teachers who participated in this study. The author would also like to extend special thanks to Cary Springer from the Statistical Consulting Center at the University of

Tennessee, Knoxville, for her invaluable help with many aspects of this project and to Dolly Young and the reviewers for their feedback on an earlier draft of this manuscript.

Notes

1. In connection with this study, the word teacher will be used to refer to any instructional personnel, including TAs, faculty, lecturers, and adjuncts.
2. The fact that computer technology was used to contact potential participants and collect their data might have excluded from this survey teachers who are uncomfortable with technology.
3. Percentages have been rounded to the nearest number.
4. This item on the survey allowed multiple answers because some teachers teach more than one language.
5. MOOs are a text-based virtual reality system often used for role-playing.
6. If values of 0 were included in the calculation, a teacher using one of the 18 surveyed applications on a weekly basis but no other applications would receive only an average of 0.63 (i.e. below the value for 1 to 2 times per semester).

References

- Al-Bataineh, A., & Brooks, L. (2003). Challenges, advantages, and disadvantages of instructional technology in the community college classroom. *Community College Journal of Research and Practice*, 27(6), 473-484.
- Association of Departments of Foreign Languages (2001). A checklist for self-study for departments of foreign languages and literatures. *ADFL Bulletin*, 32(3), 122-129.
- Baylor, A. L., & Ritchie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology-using classrooms? *Computers & Education*, 39(4), 395-414.
- Broughton, W., & Conlogue, W. (2001). What search committees want. *Profession*, 39-51.
- Butler, D. L., & Sellbom, M. (2002). Barriers to adopting technology for teaching and learning. *Educause Quarterly*, 2, 22-28.
- Carnevale, D. (2004, July 2). Report says educational technology has failed to deliver on its promises. *Chronicle of Higher Education*, 50(43), 30.
- CEO Forum on Education and Technology (2001). *The CEO Forum school technology and readiness report—Key building blocks for student achievement in the 21st century: Assessment, alignment, accountability, access, analysis*. Retrieved May 27, 2005, from <http://www.ceoforum.org/downloads/report4.pdf>
- City College of San Francisco, Office of Institutional Development, Research, and Planning (2003a). *Information technology—instructional faculty responses 1997, 1999 and 2001*. Retrieved May 22, 2005, from http://www.ccsf.edu/Offices/Research_Planning/pdf/rep101.pdf
- City College of San Francisco, Office of Institutional Research, Planning and Grants (2003b). *Survey on using technology: Administrators, department chairs, classified staff, and student services*. Retrieved May 22, 2005, from http://www.ccsf.edu/Offices/Research_Planning/pdf/rep02253.pdf
- Cotton, C. (1995). Technology-mediated learning: Are we there yet? *Syllabus*, 8(9), 26-27.
- Council of Chief State School Officers, Interstate New Teacher Assessment and Support Consortium (INTASC) (2002, June). *Model standards for licensing beginning foreign language teachers: A resource for state dialogue*. Retrieved May 31, 2005, from <http://www.ccsso.org/intasc.html>
- Demetriadis, S., Barbas, A., Molohides, A., Palaigeorgiou, G., Psillos, D., Vlahavas, I., et al. (2003). "Cultures in negotiation": Teachers' acceptance/resistance attitudes considering the infusion of technology into schools. *Computers & Education*, 41(1), 19-37.
- Egbert, J., Paulus, T. M., & Nakamichi, Y. (2002). The impact of CALL instruction on classroom computer use: A foundation for rethinking technology in teacher education. *Language Learning & Technology*, 6(3), 108-126. Retrieved April 6, 2005, from <http://llt.msu.edu/vol6num3/egbert/>
- Ertmer, P. A., Addison, P., Lane, M., Ross, E., & Woods, D. (1999). Examining teachers' beliefs about the role of technology in the elementary classroom. *Journal of Research on Computing in Education*, 32(1), 54-71.
- Fidelman, C. G. (1998). Growth of internet use by language professionals. *CALICO Journal*, 15(4), 39-57.

- Garrett, N. (1991). Technology in the service of language learning: Trends and issues. *Modern Language Journal*, 75(1), 74–101.
- Glew, E. (2000). Where do we stand? Language program direction as reflected in the MLA job information list. *Unterrichtspraxis*, 33(1), 18–23.
- Goldfield, J. D. (2001). Technology trends in faculty development, preprofessional training, and the support of language and literature departments. *ADFL Bulletin*, 32(3), 102–115.
- Green, K. C. (2000). *Campus computing 2000: The 2000 national survey of information technology in U.S. higher education*. Retrieved May 15, 2005, from <http://www.educause.edu/ir/library/pd/EDU0035.pdf>
- Kiernan, V. (2005, February 18). Colleges' spending on technology will decline again this year, survey suggests. *Chronicle of Higher Education*, 51(24), 34.
- Lam, Y. (2000). Technophilia vs. technophobia: A preliminary look at why second-language teachers do or do not use technology in their classrooms. *Canadian Modern Language Review*, 56(3), 389–420.
- Lea, L., Clayton, M., Draude, B., & Barlow, S. (2001). The impact of technology on teaching and learning. *Educause Quarterly*, 2, 69–71.
- Martins, C. B. M. J., Steil, A. V., & Todesco, J. L. (2004). Factors influencing the adoption of the Internet as a teaching tool at foreign language schools. *Computers & Education*, 42(4), 353–374.
- Meskill, C., Mossop, J., DiAngelo, S., & Pasquale, R. K. (2002). Expert and novice teachers talking technology: Precepts, concepts, and misconcepts. *Language Learning & Technology*, 6(3), 46–57. Retrieved March 24, 2005, from <http://lt.msu.edu/vol6num3/meskill/>
- Middle Tennessee State University (2002). *Assessing the impact of instructional technology on teaching and learning at MTSU*. Retrieved June 1, 2005, from <http://mtsu32.mtsu.edu:11139/index.html>
- Modern Language Association (2000, May). *Guidelines for evaluating work with digital media in the modern languages*. Retrieved June 15, 2005, from http://www.mla.org/resources/documents/rep_it/guidelines_evaluation_digital
- Modern Language Association (2002a). *More college students studying foreign languages than ever before, says new study by the Modern Language Association*. Retrieved January 25, 2006, from <http://www.eastasia.org/MLA%202002%20stats.pdf>
- Modern Language Association (2002b, November). *Guidelines for institutional support of and access to IT for faculty members and students*. Retrieved May 26, 2005, from http://www.mla.org/it_support
- Murphy, E. (2002). New tools in an old trade: Teachers talk about use of the internet in the teaching of French as a second or foreign language. *Canadian Modern Language Review*, 59(2), 215–234.
- National Center for Education Statistics, U.S. Department of Education. (2002, July). *Teaching with technology: Use of telecommunications technology by postsecondary instructional faculty and staff in fall 1998*. Retrieved June 1, 2005, from <http://nces.ed.gov/pubs2002/2002161.pdf>
- Rakes, G. C., & Casey, H. B. (2002). An analysis of teacher concerns toward instructional technology. *International Journal of Educational Technology*, 3(1). Retrieved July 27, 2004, from <http://www.ao.uiuc.edu/ijet/v3n1/rakes/index.html>
- Wilson, W. (2003). Faculty perceptions and uses of instructional technology. *Educause Quarterly*, 2, 60–62.
- Young, J. R. (2004, November 12). When good technology means bad teaching. *Chronicle of Higher Education*, 51(12), 31.
- Yun, G. W., & Trumbo, C. W. (2000). Comparative response to a survey executed by post, e-mail, and web form. *Journal of Computer-Mediated Communication*, 6(1). Retrieved January 30, 2006, from <http://jcmc.indiana.edu/vol6/issue1/yun.html>
- Zemsky, R., & Massy, W. F. (2004). *Thwarted innovation: What happened to e-learning and why*. Retrieved June 7, 2005, from <http://www.thelearningalliance.info/Docs/Jun2004/ThwartedInnovation.pdf>

	Weekly	Once/twice a month	Once/twice a semester	Never
Online assessment (e.g., quizzes)				
Have students participate in synchronous chat				
Have students participate in online discussion board				
Posting class materials online				
Expose students to Weblogs				
Have students create Weblogs				
Send students to Web site specified by teacher				
Send students to the Internet to find information				
Have students create a Web site				
Have students participate in listservs				
Expose students to listservs				
Have students participate in MOOs				
Have students create digital audio				
Expose students to digital audio/streaming				
Have students create digital video				
Expose students to digital video/streaming				
Have students work with content software programs (e.g., tutorials, instructional)				
Videoconferencing				
Other: please specify				

Which factors contributed to your decision not to use technology (more) for your teaching?

	Important Factor	Somewhat of a Factor	No Factor
Preparation too time consuming			
Implementation itself too time consuming			
Evaluation too time consuming (e.g., grading students' online discussions)			
Doesn't fit my teaching style			
Lack of applications available for my field			
Lack of resources available in my foreign language			
Compatibility issues with writing system (e.g., Russian)			
Lack of tech support from institution available to me			
My own lack of training/tech skills			
Unreliability of technology (e.g., computer crashes)			
Lack of availability of equipment			
I don't perceive any (vast) pedagogical benefits			
Negative feedback from students			
Inability to provide technical training/trouble shooting for students (either myself or from other sources)			
Other: please specify			