Technology has supported second-language pedagogy for many years. In the 1960s and 1970s, language laboratories provided drill-based practice to support audiolingualism – the dominant instructional approach of the day (Richards and Rodgers, 1986). In the 1980s, videotapes became increasingly common, and computers made their first appearance in the second-language classroom (Higgins and Johns, 1984). However, it was in the 1990s, with the explosion in Internet use and the emergence of the World Wide Web, that technology became ubiquitous (Warschauer, 1999; Beatty, 2003).

The first part of this article examines the roles played by technology in second-language learning, focusing in particular on technology as a provider of content, as a learning management tool and as a communication tool. We then examine models of classroom organization, and suggest that technology has forced us to redefine our concept of the classroom. The final major section of the article enumerates seven areas of second-language pedagogy where technology is demonstrably superior to face-to-face instruction.

The Impetus for Increased Technology Use in Second-Language Classrooms

Technology has become so pervasive that it is no longer appropriate to see it as playing a supporting role to face-to-face instruction. A major stimulus for the rise of technology in second-language classrooms has been the explosion in the demand for language training. This demand is principally, but not exclusively, for English and is a byproduct of globalization. In a recent survey of more than 25,000 employees of global corporations, the percentage of respondents who said that English was either critical or important for success in their current positions increased each quarter over an 18-month period. Figure 1 shows the growth in the perceived importance and use of English over the period from June 2003 to December 2004. During this time, those who reported that English was critical for their jobs rose from just over 50% to 80%. The percentage of global corporation employees who used English daily in their jobs rose from 35% to 60% (Figure 2).

The vast majority of those surveyed reported that their English-language proficiency was insufficient for them to be successful in their current jobs (only 9% said their English-language proficiency was sufficient to do their current jobs). Under these circumstances, the explosion in the demand for English instruction is quite understandable. This demand overwhelmed traditional face-to-face providers, and many workplace human resource managers looked to technology, particularly the Internet, to provide English-language instruction. Private corporations, such as Global English, are meeting a demand that is simply beyond the reach of conventional second-language classrooms.

Roles of Technology in Second-Language Classrooms

The three major roles played by technology in classrooms are as a carrier of content and an instructional tool, as a learning management tool, and as a communication tool.
In second-language learning, the dominant role for technology is as a provider of content and as an instructional tool. When the computer presents learners with listening and reading input, and information on pronunciation, vocabulary, and grammar, it is acting as a carrier of content. This content can be specially written for pedagogical purposes, or it can be authentic material that exists on the Web. Web-search activities are becoming increasingly popular in language instruction, and provide foreign-language learners, as opposed to second-language learners, with opportunities to learn through interacting with authentic texts. Such texts were originally created for the purposes of communication, not to teach English (Nunan, 1999). When the computer provides opportunities for learners to practice a language by doing spoken and written drills, completing comprehension questions, carrying out grammar exercises, and so on, it is acting as an instructional tool.

The second major role for technology in classrooms is as a learning management tool. This role is becoming increasingly significant in second-language pedagogy, particularly with the spread of proprietary software, such as Blackboard and Moodle. These learning management software packages enable teachers to carry out many learning management tasks more efficiently and effectively than more traditional face-to-face methods. For example, a good learning management system can:

- administer and collate needs analysis data from students;
- allow teachers to post course information, handouts, and other materials for students to download;
- enable students to submit assignments, and teachers to grade and return assignments, electronically;
- document student achievement and archive learner portfolios containing samples of spoken and written language;
- administer, analyze, collate, and store the results of classroom quizzes;
- administer, collate, and present student evaluations of teachers.

The third major role for technology in language learning is as a communication tool. One of the greatest frustrations for learners attempting to acquire another language in a foreign—rather than second-language context is finding opportunities to activate their language by interacting with other people in that language. One of the greatest benefits of technology is that it can bridge distance and time, enabling learners to interact with native speakers and other learners who are living, working, and learning in a wide range of cultural contexts in different parts of the world. At present, the most common technology-based means of communicating for purposes of language learning are e-mail and text chat, although voice chat and webcam are becoming increasingly common.

### The Technology-Supported Second-Language Classroom

As Internet resources began to supplement and, in some cases, replace traditional face-to-face instruction, teachers and instructional designers debated the merits of the virtual classroom (Nunan, 2005). Initially, there was considerable skepticism toward the notion that someone could learn a language through the Internet. Such arguments are rarely heard these days. The issue is no longer whether to use technology, but rather how technology can support classroom instruction, and the extent to which it can replace conventional second-language classrooms. Studies in online second-language learning suggest that this approach has a number of benefits—specifically, online language learning, as it
• promotes a deep rather than surface approach to learning (Biggs and Telfer 1993);
• stimulates active, constructivist learning rather than straight knowledge transfer (Weasenforth et al., 2002);
• fosters students’ awareness of discourse-related aspects of communication (Davis and Thiede, 2000); and
• allows students to share perspectives and experiences, to establish relationships, and to seek assistance (Chong, 1998).

Before examining models of classroom organization, a word on terminology is in order. Classrooms are traditionally seen as places in which teachers and learners are gathered together for instructional purposes. “The L2 classroom can be defined as the gathering, for a given period of time, of two or more persons (one of whom generally assumes the role of instructor) for the purposes of language learning” (van Lier, 1988: 47). However, with the development of distance learning, and, in particular, the use of technology, the gathering together may happen in a virtual classroom rather than a physical space.

The ease with which the computer can bring people together across time and space is forcing a redefinition of the classroom. Through the computer, the gathering together for language learning no longer requires the individuals to inhabit the same physical space. The following vignettes illustrate some of the changes wrought by technology and some of the ways in which technology has redefined the second-language classroom.

A teacher educator in Auckland, New Zealand, conducts a graduate class on second-language acquisition through a text chat site with students in Tokyo, Japan; San Diego, California; Bangkok, Thailand; and Buenos Aires, Argentina.

A student in Toronto, Canada, who was unable to make his Spanish class, is able to review a transcript of the lesson which is posted on to the Web several hours after the conclusion of the class.

A secondary school teacher in Hong Kong posts all her assignments and class handouts onto the class website. Students either work with these online as needed or download those that they want in hard copy.

Using voice chat, English as a Foreign Language (EFL) students in China, Korea, and Japan take part in a conversation class with a teacher based in Bogota, Columbia.

A school in Osaka has its students complete an online placement test which automatically assesses and places students into instructional groupings in a fraction of the time it used to take using a pencil-and-paper test.

In a keynote paper, which explored the impact of technology on second-language pedagogy, Legutke commented on the ways in which changes wrought by technology have forced a redefinition of the foreign-language classroom. He notes that “These changes challenge our self-concept as foreign language teachers, because, much more than in the past, we are now called upon to redefine our roles as educators, since we need to mediate between the world of the classroom and the world of natural language acquisition” (Legutke, 2000: 1).

Several models of classroom organization have been proposed for technology-supported classrooms. All of them involve some form of integration of traditional face-to-face classroom activity and virtual classrooms. Such combinations are referred to as blended or hybrid learning in the online learning literature. Several models have been proposed for blended learning:

- **Model 1: The traditional classroom is supplemented and supported by technology.** In this model, classroom content is delivered in the traditional face-to-face manner, but instruction is supplemented by technology. This supplementation can take the form of additional content or support for the management of learning. The teacher decides what is to be taught, how it is to be taught, and how it is to be assessed, and technology plays a secondary role.

- **Model 2: Technology delivers the content and is supported by web-based live instruction.** In this model, instructional content is delivered through technology, and is supplemented and supported by a teacher. This is the model that is followed by commercial enterprises such as English Town and Global English. For example, Global English consists of a comprehensive ten-level suite of courses which are accompanied by a wide range of additional resources such as online needs analysis instruments, grammar and vocabulary enrichment, and an online magazine. Self-paced learning is supported by a talk-with-the-teacher feature. This feature enables students to interact with a teacher and other learners in a virtual classroom through text and voice chat.

- **Model 3: Technology delivers the content and is supported by supplemental face-to-face instruction.** This model is similar to model 2, except that the live support is provided in traditional face-to-face classrooms rather than through the Internet.

- **Model 4: The fully integrated classroom.** In the fully integrated classroom, technology and live instruction work side by side. Teachers do what they do best, such as facilitating interaction in the target language, while technology does what it does best. (The final section of this article describes seven things that technology does better than teacher-led instruction.)

These models demonstrate that the early dichotomy between face-to-face instruction and virtual, technology-mediated instruction was overly simplistic. At the time that this article was written, the overwhelming consensus among second-language instructors was that some form of blended learning was the preferred option in most pedagogical situations.
Research into Technology and Language Learning

A rapidly growing body of research is beginning to provide insights into the ways in which technology is having an impact on, and changing the nature of, second-language instruction. Initially, instructors rather naively wanted to know whether the virtual classroom was more effective than the face-to-face classroom. The question is naive because, as noted in the preceding section, it is not an either-or issue. Technology and teachers each have a unique contribution to make to the learning process. The question is also naive because it is almost impossible to control and assess the relative contributions made by technology and face-to-face instruction. It also represents a return to the old method of comparing studies (is method X superior to method Y?) that proved to be futile over 30 years ago (Scherer and Wertheimer, 1964).

Contemporary research into technology and language learning can be quite sophisticated in terms of the questions and issues it addresses and the range of methods that it employs. This can be seen by looking at the list of contents from recent issues of the top journal in the field, Language Learning and Technology. Here, for example, is the contents list from the most recent issue of that journal:

- e-learning and the development of intercultural competence
- ESL students’ computer mediated communication practices
- L1 and L2 glosses: their effects on incidental vocabulary learning
- Noticing and text-based chat. (Language Learning and Technology, 10(3), September 2006.)

Questions currently preoccupying second-language researchers concerning the impact of technology on second-language pedagogy include:

- What similarities and differences are there between the discourse of online chat and face-to-face classroom interaction?
- What affective factors are at play in technology-supported classrooms?
- What aspects of pedagogy are best delivered through technology and what aspects are best delivered through teacher-led instruction?
- What is the reaction of language learners to technology-enhanced instruction?

The discourse of technology-supported communication has been a particular focus of research in second-language classrooms. This is not surprising, given that language is both the medium and the content of instruction in second-language classrooms. In one of the studies reported in the latest issue of Language Learning and Technology (‘Noticing and text-based chat’), it was found that online chat was more effective than face-to-face conversations in prompting learners to notice their own linguistic mistakes (Lai and Zhao, 2006).

In another study into the discourse features of online English as a Second Language (ESL) classes, the researchers drew the following comparisons and contrasts with face-to-face classes:

1. All the pedagogical functions identified in face-to-face classroom interaction are evident in synchronous teacher-hosted chat.
2. Choosing the appropriate responding move is crucial, both to pedagogy and the ongoing interaction.
3. The responding move enables the teacher to build a pedagogical interaction.
4. The multilayering of discourse in chat is even more complex than in face-to-face interaction.
5. Text chat may have pedagogical advantages over voice chat. For example, learners will have a visual record of the interaction. This will provide them with more time to process the message.

Benefits of Technology

There are areas where teacher-led instruction has benefits that clearly outweigh those offered by virtual instruction. These include the ability to organize, monitor, and facilitate interactive learning in small groups of learners, the ability to diagnose and deal with specific learning difficulties (although in some aspects of learning technology is catching up fast), and the ability to offer emotional support and encouragement. The importance of this last benefit should not be underestimated. The attrition rate in virtual classrooms is much higher than that in face-to-face classrooms, and it may be the positive presence of the teacher, along with the support and pressure of peers, that helps to maintain much higher attendance rates in face-to-face classrooms.

Conversely, there are areas where technology offers clear advantages over teacher-led instruction. This section comments on six of these:

- individualized study plans;
- anywhere/anytime instruction;
- patient tutoring;
- a private space to make mistakes;
- immediate, individualized feedback; and
- detailed records of achievement.

Individualized Study Plans

While there is room for some flexibility in face-to-face classrooms, in most, instruction is pitched at the middle ground. Syllabus content as well as course goals and
objectives have to be tailored to the majority, and individual needs and wants, both in terms of learning outcomes and preferred learning pathways, can rarely be satisfactorily catered to.

Technology, however, can facilitate the development of individualized study plans. In courses which are 100% virtual, each learner can have a program tailored to his or her needs, and each learner in the program can thus follow his or her own unique program. In blended classrooms consisting of a mix of teacher-led and virtual instruction, a degree of individualization can also be achieved.

At the beginning of the learning process, a series of menu-driven choices can lead the learner through questionnaires and prompts that elicit a set of terminal learning objectives. Learners can select their own preferred learning styles and strategies, and the program can recommend tasks and activities based on these choices. Learners can also indicate the level of proficiency gain they would like to achieve by a certain date. Given their current level of proficiency, the system can suggest the approximate number of hours that the student will need to study in order to achieve the goals. If the system is linked to an online bank of materials, it can also assemble a tailored set of learning resources for each individual learner.

In online courses, where the content is tagged with lexical, grammatical, and functional information, the software can also perform an important diagnostic function. As students work through the materials, the program can identify those aspects of the linguistic system where students are weak, and can suggest adjustments to the study plan to provide additional remedial practice in these areas.

**Anywhere/Anytime Instruction**

Unlike conventional classrooms, where the time and place of instruction are established in advance, electronic (e)-learning allows students to engage in learning at the time and place of their choosing. This is possibly the most obvious benefit of e-learning, although it also a possible disadvantage. Having a set time to attend a teacher-led class provides a learner with a routine that is missing from the virtual classroom. The daily pressures of work and personal life can push the time that was set aside for e-learning to the back of the learner’s daily agenda. This is likely one reason for the higher levels of attrition from virtual as opposed to face-to-face courses.

**Patient Tutoring**

As it is a skill rather than a body of knowledge to be mastered, acquisition of a second language requires time and extensive repetition. It is rarely feasible for adequate repetition to be provided in conventional classrooms. A natural tendency in a classroom with more than one student is for the teacher to move on when a majority of students demonstrate a skill, leaving the slower learner behind. The technology-driven classroom, however, has infinite patience, and learners can spend as long as they feel they need on a particular exercise or task.

**A Private Space to Make Mistakes**

Technology enables learners to study in their own private space. Here, they are free to make mistakes in private. They need not be subjected to the embarrassment and even personal humiliation of making mistakes in front of classmates. The fear of making mistakes in public is partly personal and partly cultural (see Ellis, 2009). Many learners are unconcerned at making mistakes in public. Others, however, are paralyzed with fear and embarrassment at the prospect of making mistakes. This attitude to making mistakes in public appears to be a personality factor that is linked to learning style preferences (Willing, 1994).

This is particularly important for Asian learners for whom making mistakes in front of others is a major deterrent to language learning (Biggs and Telfer, 1987).

**Immediate, Individualized Feedback**

Providing feedback to learners on how successfully they completed a particular task or exercise is a fundamental aspect of the instructional process. In second-language pedagogy, considerable research has been conducted into the dynamics of this process. Researchers have looked at what aspects of a learner’s performance should be evaluated by the teacher, when it should be evaluated, and the form that feedback to the learner should take (Chaudron, 1988).

Extensive research in both content classrooms and language classrooms indicates that the timing of the feedback is critical. The closer the feedback is to the actual performance, the more powerful is its impact on subsequent performance as well as learner motivation (Dorneyi, 2001).

In regular classroom instruction, the ability of the teacher to provide individualized feedback is severely constrained. Apart from the occasional asides to particular students during group activities, it is impossible to provide instant feedback to all the students in the class. The best that the teacher can do is to monitor student activity during the lesson, and provide feedback on the most common errors.

Online instructional programs, on the other hand, can provide instant feedback. As soon as the learner has completed a grammar exercise or comprehension task and
submitted his or her responses, the program can provide feedback on how well he or she has done. Most programs can not only tell students which answers are correct and which wrong, but also provide qualitative information on why particular responses are incorrect.

Of course, there are constraints on the types of learner performance that can be evaluated without the intervention of a human being. Questions and tasks that have a clear right or wrong answer are easier for technology to handle than ones in which more than one response is acceptable. Giving feedback on receptive skills (listening and reading) is easier than giving feedback on the productive skills of speaking or writing. At the time that this article was written, considerable time, effort, and money were being spent on developing tools for assessing students’ productive language (de Jong and Bernstein, 2001). In terms of speaking, one of the more successful efforts has been the commercial program known as Phonepass (de Jong and Bernstein, 2001). Using speech-recognition technology, this program administers a test of speaking ability on the telephone, and provides assessment takers with a language-proficiency rating. Efforts are currently underway to assess learners’ writing skills.

These programs are achieving impressive results. Phonepass assessments correlate highly with standardized proficiency tests such as Test of English for International Communication (TOEIC) and Test of English as a Foreign Language (TOEFL; Bernstein et al., 2000). However, there is considerable resistance from consumers, who are skeptical at the notion that a computer can furnish valid and reliable assessments of second-language speaking and writing (McLure, K. Global English Corporation, Personal Communication).

Detailed Records of Achievement

Allied to the preceding point is the fact that e-learning programs can assemble and provide detailed records of achievement on individual learners. This is especially helpful in a corporate setting where an administrator may be tracking thousands of learners. Global English has a particularly sophisticated set of reports on learners. Corporate administrators can track the progress and status for every user, no matter how large the program, so that they can see the impact that the program is having on individual performance.

Summary

This article began by outlining the three main roles of technology in the second-language classroom: as a provider of content and instruction, as a learning management tool, and as a communication device. It then described how technology is helping to fill a demand for language instruction that has far outstripped the capacity of the conventional classroom, and outlined four instructional models of the technology-enhanced classroom. The final section of article examined six key aspects of pedagogy where technology offers benefits over conventional teacher-led classroom instruction.

See also: Internet-based Education.

Bibliography


Further Reading