resources of the world available through the Internet. The course became more like real chemistry—chemistry practiced to solve actual problems outside the school, involving experts from a number of areas brought together because of their expertise, without regard for geography or time.

Distance education is one of the most dramatic of the recent technology-based innovations influencing education. The scenario just described is only one of thousands of examples of how distance education is changing learning and teaching.

DISTANCE EDUCATION TODAY AND TOMORROW

In the last few years, distance education has become a major topic in education. In a recent year, over 60 conferences dealt with some aspects of distance education, and almost every professional organization's publications and conferences have shown a huge increase in the number of presentations and articles related to distance education. Many educators are making grand claims about how distance education is likely to change education and training. Certainly, the concept is exciting, and recent hardware and software innovations are making telecommunications distance education systems more available, easier to use, and less costly. Distance education has begun to enter the mainstream.

Whether distance education is a mainstream form of education has been examined for several years by the Sloan Consortium. *Learning on Demand* (Allen & Seaman, 2010) is the seventh annual report by the Sloan Consortium; it presents the latest data about the growth and spread of online education in higher education in the United States. The first report, *Sizing the Opportunity* (Allen & Seaman, 2003), indicated that online and/or distance education was growing rapidly and was perceived positively by faculty and administrators. The authors of this report defined online learning to be courses where most or all of the content is delivered online. Typically, these courses have no face-to-face meetings.

One indication that online courses are a regular activity of institutions of higher education is the role of core faculty in online instruction. There has been a long-held belief that online courses are taught by adjunct professors rather than full-time staff. *Growing by Degrees* (Allen & Seaman, 2005) refutes this perception. It reports that about two-thirds of online courses are taught by regular faculty, a percentage that is often higher than that of regular courses taught by core faculty.

Another indicator of the growth of online education is the importance of this instructional approach to the long-term strategy of the institution. In 2009, approximately 60% of institutions indicated that online instruction was critical to their long-term plans, up from 49% in 2003. The only institutions that did not see online instruction as part of their long-term strategies were the smallest nonprofit colleges. In 2008, enrollment in online courses increased to about 4.6 million from 2 million in 2003. Growth has been continuous, often exceeding the expectations of organizational planners.

Another interesting report dealing with distance education in the Midwest was released by the Sloan Consortium (Allen & Seaman, 2007). This report indicated that:

- The 11 midwestern states represent about 15% of online enrollment, with over 460,000 students taking at least one online course in fall 2005.
- The proportion of midwestern institutions with fully online programs rises steadily as institutional size increases, and about two-thirds of the very largest institutions have fully online programs, compared to only about one-sixth of the smallest institutions.
- Midwestern doctoral/research institutions have the greatest penetration of offering online programs as well as the highest overall rate (more than 90%) of having some form of online offering (either courses or full programs).
- The proportion of people who believe that online learning outcomes are superior to those for face-to-face learning is still relatively small but has grown by 34% since 2003, from 10.2% to 13.7%.

The Sloan Consortium reports (Allen & Seaman, 2010; Picciano & Seaman, 2007) also provide excellent criteria for distinguishing among online courses, blended/hybrid courses, and Web-facilitated courses. An online course is one where most of the content is delivered online, which means at least 80% of the course content. A blended or hybrid course combines online and face-to-face delivery; thus, 30% to 79% of the course's content is delivered online. A Web-facilitated course uses Web-based technology, but less than 29% of the content is delivered online.

In spite of the phenomenal growth of distance education, two conflicting pressures confront distance educators (Figure 1–1). First, students say their first choice is not to learn at a distance. When asked, they say they prefer meeting with the learning group and the instructor in the classroom, the lecture hall, the seminar room, or the laboratory. Students report that they value the presence of a learning group, and that the informal interactions that occur before and after, and sometimes during, a formal class are valuable components of the total learning experience. Second, and conversely, evidence suggests that students are increasingly demanding to be allowed to learn at a distance. They want to be able to supplement,
and even replace, conventional learning experiences with distance education experiences. Learners say this is because many other considerations besides personal preferences motivate them, especially considerations about where and when they learn (Picciano & Seaman, 2007).

These opposing preferences pose a dilemma for the educational community. Should resources be dedicated to improving the traditional educational infrastructure of buildings, classrooms, laboratories, and offices? Should students be transported to these facilities? Or should money be used to develop modern and sophisticated telecommunications systems? The trend seems to be toward telecommunications. Because of advances in technology, effective educational experiences can be provided for learners, no matter where they are located. In other words, technologies are now available to develop cost-effective distance learning systems.

Virtual schools are becoming important in many locations (Berge & Clark, 2009). The Florida Virtual School, established in the late 1990s, offers a wide selection of courses (Johnson, 2007). The Arkansas Virtual School is another successful example of a state-adopted distance education program (Falduto & Ihde, 2007).

Compressed video systems use telephone lines and Internet connection to permit live, two-way, interactive televised instruction.

CHAPTER 1  FOUNDATIONS OF DISTANCE EDUCATION

Universities are also sponsoring virtual schools. Indiana University High School and the University of Missouri's Columbia High School are examples of university-sponsored virtual schools. The North Central Association of Colleges and Schools has accredited both schools. The Indiana and Missouri schools are financially independent of their universities. High school students pay tuition for courses that are developed and taught by certified teachers. A large number of other states are following the lead of Florida, Arkansas, Indiana, and Missouri. Concepts such as the virtual school have caused the practice of distance education to dramatically change in the last decade. Traditional approaches to distance education based on the delivery of print and broadcast media technologies are no longer as relevant to the field as they once were.

As a matter of fact, a redefinition of distance education has occurred. Distance education is now often defined as:

institution-based, formal education where the learning group is separated, and where interactive telecommunications systems are used to connect learners, resources, and instructors.

(Schlosser & Simons, 2009, p. 1)

This definition was recently adopted by the Encyclopedia Britannica.

THE EFFECTIVENESS OF DISTANCE EDUCATION—IN CASE YOU WONDER

Many who begin studying distance education wonder about the effectiveness of this approach to teaching and learning, and although Chapter 3 discusses distance education research in depth, this section summarizes that research and briefly describes what we know about the effectiveness of distance teaching and distance learning.

According to the 248 studies that were compiled by Russell (1999), there is no significant difference between distance learning and traditional classroom learning. In other words, distance learning (can be) considered as effective as face-to-face learning, and our results support this conclusion. (Dean, Stah, Swolvery, & Pearl, 2001, p. 252)

Russell (1999) and Dean and colleagues (2001) reported results that are indicative of the research on the field of distance education. Most who are deeply involved in the field of distance education are unsurprised by these summaries of the research. As a matter of fact, it is very clear that instruction delivered to distant learners is effective and that learning outcomes can be successfully attained when offered to students at a distance (Anglin & Morrison, 2000; Cavanaugh, Gillan, Kromey, Hess, & Blomeyer, 2004; Hanson, Maushak, Schlosser, Anderson, & Sorenson, 1997; Simons, 2002).

In 1983, Clark clearly stated that the media used to deliver instruction had no significant impact on learning:

The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in nutrition . . . only the content of the vehicle can influence achievement. (p. 445)