

Instructional Media and the “No Significant Difference” Phenomenon

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Since the growth of the World Wide Web and browser technology in the 1990s, there has been a major renewal of interest and investment in distance learning and instructional technology in higher education. According to the most recent data available from the U.S. Department of Education’s National Center for Educational Statistics, in 1995, 33% of all American institutions of higher education offered distance education courses and another 25% reported



that they “planned to begin offering” such courses within the next 3 years (NCES, 1998). These numbers do not include the growing numbers of private, for-profit distance education ventures in the U.S. and abroad, including those by the Pearson media group in Britain, the French firm Vivendi, and American companies like Kaplan, best known for standardized test preparation. According to the *Economist*, “More than 200 companies are fighting

to offer consulting services in the promising area of e-learning for businesses” (“Lessons,” 2001; see also Harris, 1999).

As academics, many of us are well aware of the debates surrounding the costs of mediated instruction, as well as its potential consequences for the organization and governance of higher education. Since 1997, however, interest has focused more sharply on the educational effectiveness of distance education technologies (principally, Web-based courses or live video/audio/multimedia teleconferencing) with conventional face-to-face methods. An annotated bibliography by Thomas Russell entitled *The No Significant Difference Phenomenon* (Russell, 1999) has been something of a lightning rod, drawing fire and praise from advocates and critics of distance education alike. Russell, who is the head of instructional media services at North Carolina State U, has compiled over 300 studies dating back to 1928 that support Clark’s (1983) assertion that research has found “no significant difference” in the learning outcomes of live versus mediated instruction. He continues to collect and solicit distance education studies for the original list and is compiling a (so far, considerably shorter) companion list of studies that do show differences. (The most recent studies are listed, and interested contributors can submit studies for the lists online at <http://teleeducation.nb.ca/nosignificantdifference/>).

Whereas the *No Significant Difference* bibliography has been used to justify greater investments in distance education courses and programs, or the adoption of increasingly sophisticated new media technologies, Russell’s purpose is more complex. He argues that not only is there a preponderance of evidence that face-to-face and mediated instruction are equally effective, studies also show that elaborate, expensive technologies are no more effective than simpler methods like loaned videotapes, one-way live video with telephone links to the instructor, or even printed materials sent through the mail. Therefore, he says, institutions that invest heavily in technology infrastructures and content development may not achieve any better learning outcomes, or reach students any more effectively, than they would using less costly or complex techniques (though more elaborate systems may achieve other objectives, such as enhancing an institution’s image, or creating avenues for industry partnerships). Russell is clearly an advocate of distance learning and of using instructional media, particularly to reach students from underserved communities or nontraditional backgrounds, but he endorses what might be called “medium-tech,” rather than “high-tech,” solutions (Russell, 1997).

Russell’s concerns about the expense of distance education are shared widely. According to the NCES data, 31% of U.S. higher education institutions cited their limited technological infrastructures and 23% mentioned equipment failures and maintenance costs as factors that would keep them from expanding their distance education course offerings. However, fully 43% of institutions cited the costs of program (content) development as a barrier. One study conducted for the Arizona community colleges (Instructional Media & Management, 1998) estimated that the cost of developing an Internet-hosted college course ranges from \$6,000 to \$1 million, with \$18,000 to \$37,500 being “reasonable” (p. 7). For example, *The Economist* recently reported that the School of Dentistry at UCLA spent \$750,000 and 5 years to develop an online course in periodontics (“Lessons,” 2001). Furthermore, the Arizona study suggested that if they are updated annually, most distance courses have a “useful life” of 5 years. Such updates add 10 to 20% of the original development costs per year, so the total cost per course over 5 years ranges from about 140% to 180% of the original development costs. The report also notes that, although the costs for developing an Internet-hosted multimedia course are about double that for a conventional text-based course, the costs approach parity when course enrollments reach 400 to 500 students per year.

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Russell and his bibliography do have their critics. A subsequent study by the Institute for Higher Education Policy (IHEP, 1999) found that most original research studies of distance learning conducted in the 1990s, including many of those in Russell's bibliography, are poorly designed. They lack control groups, do not select subjects randomly, or lack experimental controls for confounding variables that can affect learning outcomes, such as student attitudes or faculty teaching methods. Most studies compare just one technology with conventional classroom teaching, rather than incorporating multiple media as distance education courses often do. The outcome measures used are ordinarily instructor-created tests or exams that have not been assessed for their validity or reliability. In addition, the IHEP study found that two issues warrant further investigation. First, distance education courses tend to have higher numbers of student dropouts than do conventional courses, and, second, the digital library resources that support distance learners often are inadequate. According to the IHEP report, there is evidence that some distance education curricula have been modified to fit the reduced availability or uneven quality of resource materials available online.

Other observers take a different view of the “no significant difference” controversy, pointing out that the exclusive emphasis on measurable academic outcomes (i.e., testable changes in knowledge) as the sole standard for success in distance education misses much of the point of higher education. Jerry Farber (1998) argues that academic performance is a necessary, but not sufficient, criterion for the success of postsecondary education. “Competence” must be complemented by what he calls “education”—the life experiences and socialization that result from personal involvement with the campus setting, professors, and even more critically, other students: “. . . if we want no more than measurable competence, it comes fairly cheap. But if we want education . . . we need to stop pretending that we can deliver the university experience on a screen.” Noting that new technologies have prompted private firms to view education as a vast untapped well of “content” to be sold, as well as the current vogue for standardized testing and rigidly scripted curricula at all educational levels, Farber warns that “what is not testable tends to become marginalized.”

Farber cites highly regarded studies by Pascarella and Terenzini (1991) and by my UCLA colleague Alexander Astin (1993) that show that college-educated people differ from other groups in terms of their cultural and political attitudes, values, and psychological styles (e.g., they tend to be less authoritarian and dogmatic, are more flexible and tolerant of ambiguity, and show greater preferences for abstract, reflective thought, and rational, critical problem-solving). According to this research, the greatest influence on such attitudes and orientations is exposure to, and interaction with, student peers.

It should be no surprise that so many institutions have staked so much on new media to extend their reach. Colleges and universities played a major role in the development of most contemporary new media technologies and have decades of experience using older technologies like broadcasting and film in undergraduate, extension, and professional education (for example, see Parker & Hudson, 1973). Notably, Wilbur Schramm explored the range and quality of instructional media and compared them with live teaching in *Big Media, Little Media* (1977). From this perspective, Russell's lists are particularly interesting because they comprise a selected historical survey of the use of media in American education. In addition, the current controversies over distance education raise some familiar themes in communication research, notably the classical dichotomy in communication studies between mediated and face-to-face interaction. In the long run, perhaps the most “significant” thing about the “no significant difference” phenomenon may be that it calls into question some of the taken-for-granted differences between face-to-face interaction and communication at a distance.

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