Chapter 8.1
Contemporary Issues in Teaching and Learning with Technology

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INTRODUCTION

To speak of contemporary issues in instructional technology is like counting wave crests in a stormy ocean: they are changing quickly all the time. New technologies and new issues present themselves daily. Educators struggle with both the instructional integration of computing and developing the skills and knowledge necessary to use technology effectively (Lipscomb & Doppen, 2005). Why, after over 30 years of having computers in schools, are educators still having such difficulties?

Today's population is much more accustom to electronics, yet knowledge is weak, concepts are misunderstood, and the difficulties of teaching with technology seem as serious and convoluted today as ever before. The great physicist and thinker, Richard Feynman, offered some critical comments about the challenges of educators. "What happens is that you get all kinds of statements of fact about education, about sociology, even psychology — all kinds of things which are, I'd say, pseudoscience" (Feynman, 1999, p. 242). Today, we understand "more about education [but] the test scores are going down…we just don't understand it at all. It just isn't working" (p. 243). Being critical of how the scientific method is applied to education, Feynman's comments highlight how the study of teaching and learning yields limited or questionable results. Teacher trainers take their best guess on how to prepare teachers to use technology.

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BACKGROUND

Educational computing is a relatively new discipline compared to mathematics and science. While the earliest uses of computers might have been by departments of mathematics, it quickly became important for virtually all teachers to become computer literate. But what exactly that entails was not exactly clear (Galloway, 1985) for learning and in society (Beaty & Tucker, 1987).

Microcomputer technology, primitive by today's standards, lacked user-friendly applications, any sort of consistent user interface, or easy-to-use telecommunications and interconnectivity. There was an early division between those who learned to program computers vs. those who focused more exclusively on applications software. Conceptual development, improvement of problem solving, and higher-order thinking skills in computing have been directly linked to the inclusion of Logo programming (Allen, 1993; Battista, 1994; Borer, 1993; Dalton & Goodrum, 1991) and BASIC programming (Overbaugh, 1993). Yet, in spite of an overwhelming need to operate early microcomputers through programming, educators focused instead on the actions and procedural tasks of specific applications (Galloway & Bright, 1987).

With this as a foundation, decades of training have followed in which educators have tried to master new devices and software. So, how long does it take to reach a point of nationwide competency, to develop the protocols of effective use, to establish the knowledge of how best to learn computing? Compared to centuries of science and mathematics, perhaps our 30-plus years do not seem so long.

EDUCATORS LEARN COMPUTING: A PROBLEM OF PERSPECTIVE

Our collective perspective on what it means to learn computing affect what goals we pursue and how we proceed. For example, the use of rubrics or portfolios were not commonly emphasized in education 30 years ago. Today, they are an accepted or at least popular tool for preparing educators (Galloway, 2006; Rural School and Community Trust, 2001). Does this represent progress or perhaps just a symptom of changing fads? Is this a function of real knowledge or mere opinions? This is again reminiscent of a Feynman (1999) criticism, as he suggests that professionals 30 years ago have as much right to a correct opinion as we have today, "to equally unscientifically come to a conclusion" (p. 243)—even if wrong.

Preparing Teachers

It is unlikely that educators younger than their mid-40s graduated high school without having computers in their education. There has been, since the late 1970s, a continual focus on the needs of teachers to learn and adapt to a technology-based profession.

Our attempt over the years to change educators into computer-literate professionals essentially failed. Many will argue the point, as clearly there are countless success stories. But, with the exception of the techies and innovative pioneers, educators across the profession a generation ago did not, have not changed their basic approach to integrate technology.

Compared to in-service classes, college courses, training, or other options, an overwhelming majority of teachers maintain that their primary methods of learning computing was through self-study and personal experimentation (Galloway, 1997). It can be argued that teachers must assume a responsibility for advancing their technological knowledge and be engaged learners.

When taking a computer class, one must go beyond the prescribed activities. For example, it is not likely that one would be assigned the experience of losing a file or opening a file with the wrong program. These frustrations can be a very necessary part of learning. Far too often educators are passive and restrict their involvement to oc-