

What's Wrong With Multimedia In Higher Education?

Martin B. Solomon
The University of South Carolina

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Many people have complained that our higher education system moves too slowly. Richard Cyert, president of Carnegie Mellon University, complains that we teach classes today the same way as our ancestors, without innovation or change. Ken King, the previous president of EDUCOM, half-facetiously points out that it took ten years to get the overhead projector from the bowling alley to the classroom. It is true that the pace of change in higher education has been geologic in some ways. But perhaps that is one of the strengths that has made it the envy of the world—not jumping too fast to adopt fads and sticking to the basics have been good formulae for success.

On the other hand, things are changing quickly today. To be successful in the future, organizations and institutions must either predict or invent the future. Higher education is doing neither. Just as IBM ignored the clear signals that the world was changing and got blindsided by its competition, higher education is equally vulnerable to experiencing the same disaster.

It is obvious that higher education is pricing itself out of the market. But higher education's costs continue to mount. Just as IBM's bloated bureaucracy reduced its flexibility to make timely decisions and added layers of costs to its products, higher education likewise continues to cling to a collegial form of governance that may no longer serve its best interests. William Massy of Stanford University has observed that this governance system has shifted vast university resources from teaching to research.¹ This has resulted in teaching loads falling from about 12 contact hours per semester in the 1960s to about six hours in most universities today.

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The Three Revolutions

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At the same time that teaching loads are falling, higher education must spend huge amounts of money to deal with hundreds of compliance issues, an increasingly litigious society and work force, and massive amounts of reporting to satisfy accountability requests. Because of these factors plus inflation, the cost of higher education has been increasing at double the consumer price index.

Just as IBM believed that the high quality of its products sufficiently differentiated it from its competitors, universities and research institutions also believe that their high quality will insulate them from "less sophisticated" competitors. However, when the cost differential becomes too great, customers shift suppliers, as IBM learned the hard way. When the students simply don't show up, it will be too late to adapt gracefully to this new world.

Consequently, many people within the higher education community have been busily developing creative multimedia courseware to try to change the paradigm. Is multimedia a way out? Maybe, maybe not.

This paper explores the factors that have inhibited widespread use of multimedia instructional courseware in U.S. higher education as well as the factors that are necessary to allow multimedia to thrive.

Higher education has witnessed three different revolutions over the past 20 years. The first was the advent of television; it was to change the very foundations of education by bringing the world to the classroom and providing more interesting and innovative material to the student. It didn't happen.

Although higher education spent millions of dollars producing films and videotapes, there was never widespread adoption. Some say that the NIH syndrome (Not Invented Here) was responsible. Nevertheless, we spent great sums of money trying to change the teaching paradigm. It is ironic that television radically changed every facet of our society *except* education. Television has transposed forever our political system, our youngsters, our perceptions of the world around us and even the teaching of religion. Higher education alone escaped unscathed.

The second revolution was the microcomputer; it was to change the very foundations of education by bringing the world to the classroom and providing more interesting and innovative material to the student. It didn't happen.

While it is true that higher education spent billions of dollars on microcomputers, most of these resources related to word processing, learning computer literacy or filling in

spreadsheets. While these functions are useful and meaningful, we cannot measure the precise value that microcomputers added. Two things are clear however: they have definitely increased costs, and education as we know it has not fundamentally changed over this ten-year period.

The third revolution is now multimedia computing, and again, it is to change the very foundations of education by bringing the world to the classroom and providing more interesting and innovative material to the student. Although multimedia computing and computer-based instruction have been around for over 30 years, it isn't happening. The questions are: why, and what do these failed revolutions have in common?

While some very good TV, microcomputer and multimedia materials are in use today, none have changed the nature or fundamental quality of higher education in the U.S. For the most part, materials are not transferable. Is this the NIH syndrome again? Each faculty member wants to tailor the course to fit precisely his or her notion.

To some extent that same phenomenon occurs with textbooks. When a faculty member does not like any of the textbooks available, he or she sometimes writes one. This often requires several years of intensive effort, not too different from the development of multimedia materials. The rewards *are* quite different, however. A reasonable successful textbook can net the faculty member \$50,000. A really successful one can bring in six or seven figures. Similar inducements do not normally exist today for courseware development.

Culture of Higher Education

A primary reason for these failures is the culture of higher education. In virtually all research institutions and large universities, faculty do not feel they have time to devote to serious innovation in the classroom. For one thing, they have been doing quite well, thank you, without these innovations.

Another reason is that there is not sufficient credit toward tenure and promotion for such activities. The Center for Innovative Technology at North Carolina State University, for example, discourages assistant or associate professors from becoming too involved in developing multimedia materials. They suggest that only full professors can afford to spend time in this manner.

Without an excellent research record, one cannot expect a promotion in other than teaching institutions. However, in teaching institutions the teaching load is so high (normally 15 or 18 contact hours per semester) that there is insufficient time.

Financial Costs

To implement multimedia instructional materials today, one must invest in rather expensive equipment for students. Although the cost is coming down, it is still staggering to acquire significant numbers of student stations. Present technology requires computers with videodisc players, CD-ROM drives, audio capability, color displays, etc.

To make matters worse, multimedia is almost universally optional or enrichment material, designed to improve the quality of the educational experience. But higher education is over the proverbial barrel today. If the options are to provide new computer enhancement or offer salary increases to faculty, which will get funded?

We do see pockets of use and some very good materials, but not on any large-scale basis. Unless and until multimedia can reduce the cost of higher education, I do not believe it will receive the needed investments.

Standards Dilemma

There are too many different platforms and techniques to allow either affordable equipment or affordable development efforts. For full-motion video one can use analog videodiscs; videotapes; or digital video formats in DVI, JPEG, MPEG, PX24 and other standards. Microsoft attempted to create a standard a year or so ago, but most manufacturers continue to pursue individual agendas. This technology might be doomed without one single standard for graphics, video and full-motion video. The costs are just too high. Even if component costs fell to \$400 per workstation, it would be too much.

It is not only a single standard that is the issue, but one that can deliver audio, video and programs inexpensively over a network. Connecting a series of devices to each computer is costly, cumbersome and does not allow for remote access from home or office.

If you look at the history of higher education in the U.S., we began with major state colleges and universities, often located in the geographic center. Then, in an effort to reduce students' costs, we created community colleges close to people's home. The next strategy is remote access. Just as TV can reach out to people in each community, the future success of multimedia will lie partially in people's ability to access the educational experience from their home or office without physically traveling to the campus.

Multiple Talents Required

Developing quality multimedia courseware is too difficult for 98% of all faculty. Watch the end of a movie next time and notice that to produce 120 minutes of interesting material, it required 100 different people at a cost of, say, \$15 million. A

typical higher education semester comprises over 2,000 minutes of material. Reasonably, a meaningful amount of multimedia content might cover 10% of the course. That comes to 200 minutes—much more time than a multi-million dollar movie.

Providing a faculty member with a multimedia computer, a camera, a videodisc and a sound card is like giving someone a hammer, nails and lumber and asking for a house to be built. A skilled, trained professional can transform hammer, nails and wood into a nice house. But the typical faculty member has insufficient training in graphics, computer programming, directing, producing, animation and the like to make a success out of multimedia.

Time Required

Even for that rare individual with all of the necessary talent to make a program a success, it takes too much time.

Successful production of multimedia materials requires literally hundreds of hours of planning; hundreds of hours of programming, hundreds of hours of observing student behavior, and hundreds of hours of revision, revision and revision. Even then, the task is not finished. It must be debugged and made bullet-proof so that students will not become frustrated and give up.

Consequently, most people who begin the process of developing multimedia courseware give up soon into the process. It's impossible, in the initial heady days, to really comprehend the vast quantity of time that will be required. After developing a few modules, however, instructors realize that it takes too much time to make any real impact. Others begin cutting corners and end up with boring materials that students hate. And remember, it is a fact that in some places faculty have failed to receive tenure or a promotion because they devoted too much time to developing instructional materials and not enough time to producing quality research.

James Noblitt, who taught French at Cornell University, is one of the most talented teachers I ever met. Jim and two of his colleagues set out to develop a French word processor. (It was actually much more than that because among a myriad of features was the ability to translate text in both directions and look up any form of a verb in its dictionary.) Anyway, the project was still not finished after *three years*. The program, called *Système-D* (a French-language play on words), still had a few bugs, was not documented for general use and contained some annoying features that needed fixing. To finally finish it required hiring a full-time professional programmer at a substantial cost.

The time needed to produce quality multimedia is more than significant. It is staggering!

So, Where Do We Go?

The earlier failure of television in higher education occurred for the same reasons as the current failure of multimedia. It takes too much time, requires too many varied talents and there is no compelling incentive. However, let's not give up hope.

With the fast pace of technology, network-based multimedia delivery will become more commonplace at costs that are much more reasonable and with better standards. Then, when the market is large enough, the commercial sector will be able to afford to develop high-quality materials with a low per-unit costs.

Success will come when:

- multimedia is delivered inexpensively over a network rather than through use of individual, fully equipped workstations;
- multimedia displaces costs rather than increases them;
- standards allow mass marketing of multimedia materials; and
- commercial publishers invest the necessary resources to produce exceptionally high-quality materials. ■

Notes ¹ Massy, W., "Improving Academic Productivity: The Next Frontier," *Capital Ideas*, Stanford, (Sept./Oct. 1991).

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Martin B. Solomon is Vice Provost for Computing & Communications and a professor of computer science at The University of South Carolina. He is also a contributing editor for the T.H.E. Journal.