Where Is the New Learning?

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In the past 20 years, the expenditures on university campuses for digital technologies have mushroomed, from millions to billions of dollars, from hundreds to thousands of support staff and system designers. At the same time, digital technologies have witnessed exponential growths themselves—in processor speeds, in transmission rates, in memory, in bandwidth. Goodwilled and generous investments in information technology units on campus have created sophisticated digital infrastructures that were hardly imagined a few decades ago.

Yet of the billions of dollars now spent on technology at universities across the country, I suggest that only a very small percentage of this resource is directed at enhancing teaching and learning. Certainly there is general technical support for teaching and learning—including administrative support, network administration, and general computer support for word processing, PowerPoint slides, and web access—but there is little specific investment in teaching and learning that attempts to take full advantage of digital opportunities in enhancing this domain. Administrative infrastructures are hungry for resources, security is critical, basic operations require attention, and professors are busy. There are few resources and little time available to focus on teaching and learning broadly defined. This means that while we may have new media, we don't necessarily have new learning.

A Little History

More than 20 years ago, in 1987, Apple Computer, Inc., introduced HyperCard to the marketplace, including it on all new Macintosh computers. It was a new kind of technology product, one that brought many ideas from research labs into the mainstream. Developed almost single-handedly by Bill Atkinson, the author of MacPaint, the basic model of HyperCard was the linking of static cards. These cards had texts or images on them that could be linked to other cards (in "stacks") with simple clicks. Clicks on texts or images could also initiate a movie, initially shown on a second screen (remember, video was an analog signal) though

eventually moved onto the computer screen with the use of digitizing boards. HyperCard stacks were created using a new language, called HyperTalk, which was readily accessible to nonprogrammers.

In addition to providing a new model for off-the-shelf computing that included hyperlinked multisensory user-programmable attributes (arguably the key elements even today of new media), HyperCard introduced an even more profound capability to the mainstream computational realm—a focus on content, not calculation or analysis. And content didn't mean simple listings of texts or even images; it included experiences in pursuing ideas, doing things, and relating concepts. In a computational sense, HyperCard was rather unsubstantial. On the other hand, it provided innovative ways to present hyperlinked content materials that could be explored interactively, materials that included speeches and movies and images as well as text. It extended the palette for learning experience design.

For a number of years after the release of HyperCard, substantial activity in learning enterprises—including universities—was aimed at developing examples of new learning opportunities with HyperCard. I still remember my excitement in seeing Professor Larry Friedlander's project at Stanford—From Page to Stage—which showed a number of different performances of the same text from Shakespeare and which provided exercises in blocking out scenes in a variety of ways. Not only did my understanding and appreciation of Shakespeare increase in this viewing, I also had the intuition that I could now begin to understand and appreciate all performance arts in ways I had not before. I have similar memories of watching Professor Robert Winter of UCLA demonstrate his analyses of Beethoven's music, providing commentary on both the technical aspects of symphonies and a sense of their aesthetics as well as providing exercises for the viewer to enhance the understanding of these elements.

At the time, I directed the Apple Multimedia Lab, where our charter was to explore the implications and opportunities for HyperCard to enhance learning. Our method of exploring was to make examples of electronic environments that provided significant learning opportunities for students. We spoke of this new media-rich capability as the "new printing press." In thinking about this, we came to more explicitly appreciate the attributes of the printing press—including its abilities to create multiple copies of materials and its methodology, which focused on moving ideas beyond geographic, temporal, and personal boundaries. We imagined how excited Gutenberg would have been if he had had the capability to add sounds, pictures, movies, and interlinkages, nonlinearity, and make-your-own capabilities to his products.

We considered the opportunities to reform all of education—from kindergarten to graduate school—engaging these new capabilities, and we were very optimistic. As part of this activity, we looked to universities for collaboration in a number of contexts. One example was the establishment of the New Media Centers (NMC, now titled the New Media Consortium, given a change in concept). Acknowledging that most faculty did not have the instincts or talents to engage electronic environments for learning, we partnered with Adobe and Macromedia to support a number of centers on university campuses that would provide support to interested faculty in creating electronic learning environments for students and suggest examples of new media opportunities in the faculty member's area of interest.

We also partnered with Kinko's to provide publishing mechanisms so that materials created on one campus could be available more generally, so that faculty could move beyond their face-to-face traditions and extend their expertise to students who weren't in their classes. Our intention was to seed a new "media-rich learning enterprise"; we would provide the technical tools and universities would create new media genres for learning that would reveal new opportunities for our tool development.

Fast Forward to 2008

It has now been more than 20 years since HyperCard was introduced, and approximately 10 years since the Internet has been engaged broadly to add the powerful notion of interconnectivity to the learning experience design palette (thus enabling all sorts of revolutionary social networks and distribution opportunities). Yet I do not think that universities have contributed very much to the exploration of new media learning opportunities during these years, most certainly not in ways that go beyond local geographies, times, and individuals in the spirit of the printing press.

Those innovations that have been made have been typically limited to individual campus contexts, and often to a handful of professors. Most of the new media genres—wikis, blogs, and podcasts, IM and Facebook, virtual realities and gaming—have emerged from the popular culture, not the university culture. University publishers remain focused on research publications, not teaching materials, and these typically remain print- and paper-centric.

There have been few substantial electronic treatises developed at major universities to provide systematic understanding of new materials or to extend the reach of single-university professors. Textbooks and

readers and original source materials are still the major sources of direct information for students (including Internet versions of these); face-to-face lectures are still the central methods for conveying content (although they might include PowerPoint slides); and text is still the coin of the realm. The medieval models of university education are alive and well, even as texts are now transmitted electronically instead of in conversation or on paper. Even attempts at scaling a good university experience, through distance education of a range of types, do not typically go very far beyond reenactment of lectures over distances or wider distribution of print materials.

New Media Can Support New Learning

One could logically argue that this situation has emerged because new media do not offer anything for learning, that their capabilities are fundamentally suited for pop culture and commercial enterprises, that they have no relevance to the serious abstract theoretical thoughtful domain of the university. Yet, although it is the case that some of the uses of new media are mindless, this position is countered by countless examples of situations where new media have been shown to provide important insights and significant learning:

- Simulations and games can provide high levels of engagement, providing opportunities for what-if reasoning explorations as well as direct experience over extended periods of time for direct interactions with phenomena.
- Movies and stills of historic interviews or events and of historical artifacts and reconstructions provide original evidence as well as elements for research explanations.
- Media-rich field observations of biological phenomena can provide important materials for later analysis, as well as powerful elements for encouraging conversations.
- Connections between experts spread around the world and aggregations of data gathered from sensors also spread globally can enhance collaborations and explanations.
- Distributed blogs can provide multiple interpretations of events that are not possible with a limited number of professional media outlets.

And, contrary to 20 years ago, most of us have had direct experience with a number of examples like these.

In addition, a number of arguments for these new media representations have been set forth in the past two decades to encourage the serious

consideration of their incorporation in learning. Many arguments focus on learning style; these arguments suggest that new media representations are very important to certain learners, such as visual and acoustic learners and others who struggle with texts. Other arguments are based on representational appropriateness; these arguments suggest that certain materials require new media for their core development, be it the interlinking of original source materials in the humanities or the economic simulations of large data sets or the acoustic readings of poetry to lend focus to the sound of the poetry. There is also a popular set of "fashion" arguments emerging; these suggest that this is the way the world is going, hence it is important for students to gain currency in this world.

At first glance this last argument might be considered faddish, and in some sense it is. Just because everyone is doing it, why should new media be incorporated into the university learning enterprise? However, this argument becomes very powerful once one acknowledges that the youth of today are being brought up in a world that is densely packed with new media experiences; interactions with television, video games, and the computer take up a substantial amount of a youth's life by the time he or she enters the university. It seems quite reasonable to take advantage of the perspectives and skills developed by these individuals, and it becomes important to acknowledge their backgrounds as one designs learning environments for these digital youth, providing them with knowledge and experiences to allow them to move from their status of digital natives to responsible digital citizens.

Yet, few universities have developed sustained programs to investigate new media opportunities systematically, to identify where they are effective and where they are not. Nor have faculty broadly embraced new media opportunities in extending new learning opportunities for their students. There are few university groups that address the interdisciplinary field of new media learning, and no emergent "new media rhetoric" departments to investigate opportunities in this arena.

Obstacles to New Learning

There does not seem to be any strong intellectual argument about this, but instead the inertia to stay with the familiar is routinely overcoming the instinct to try to improve, in a system that has few established metrics that might identify a need for improvement in the learning enterprise. There are frequent blips in the learning landscape, as something exciting emerges, but then, unfortunately, the promising developments typically disappear or are replaced by something even more exciting for the moment.

Administrative organizational structures, even those initiated to support learning, tend to focus on meeting the insatiable demands of the changing technologies, and the invention of new learning approaches (or the sustenance of approaches that were new 5 years ago) is put aside. Brave faculty who embrace the new media opportunities typically burn out after a couple of years of experimentation, or they come to their senses and focus on their research and the demands of their institutions for promotion.

Some argue that the reason faculty cannot create great learning experiences for their students is that they don't have the financial resources that commercial enterprises have. Video games require millions of dollars to create, for example, establishing quite a high bar for visual design and interactivity that seems by many to be impossible to match. Of course, the reason video game companies can invest this much in their games is that they plan to sell the games and recoup their investments (and more). And yet universities, which are themselves multimillion-dollar businesses receiving direct payment from their "customers" for "learning services" (for example, tuition), have not organized themselves to invest directly in the development of new learning materials and environments.

The core investment that universities do make in the learning enterprise is to hire great faculty, and then give them almost complete freedom and autonomy in carrying out their teaching responsibilities. Great faculty are obviously central to great universities and can be very important for student learning, but, almost by definition in most academic fields, these great faculty are extremely immersed in print representations of their expertise. Few university faculty claim to be expert in nontextual, nonlinear distributed explanations, and if they do, they are not typically provided stimulating environments in which they can extend their expertise with colleagues.

The new media resource groups that have emerged on campuses struggle to collaborate with faculty. The hierarchies that divide faculty and staff prevent equal collaborations between form and content, and so the assistance that staff can provide faculty is typically limited to technical assistance rather than to significant experimentation and imaginative explorations of explanations and learning activities in a content domain. Collaborations between faculty and new media experts and craftsmen more often than not disintegrate, as an equal footing for "form and content" in a design activity is very difficult to maintain.

Outside of the university there are few economic drivers for the exploration and development of new media learning opportunities, especially to pursue implementation at scale after an initial idea has been articulated and demonstrated. Resources on the Internet are expected to

be available at no cost (except for the viewing of some distracting advertisements) and the technical updating of electronic products has proved too expensive for most publishers. No new publishers have emerged to support the "new media textbook" (acknowledging that both the words *text* and *book* are metaphoric), so there are not even the traditional venues for the development of teaching materials in collaboration with an outside publisher available for new media materials.

Without university support or organization or outside resources, faculty are then very unlikely to commit substantial resources to develop new media environments for their students. Many media support facilities then go ahead and develop new media materials without faculty involvement; yet without faculty participation in creation and a broad faculty commitment to use, the impact on the students and the institutions is typically not very significant or long lasting.

Summary

At the end of the day, we are committing billions of dollars to digital technologies on our campuses, and we are not impacting the fundamental competencies of the academy as a place of learning. Research has advanced significantly in its engagement of new technologies—to model new phenomena, to gather new data, to visualize new results in ways not possible without the technologies—but the general mission of learning at universities has not typically followed this successful model.

We are supporting lots of computers and many tools for individual expression and information gathering. We are extending infrastructures to support the newest digital technologies that are introduced by industry. However, at the core, we are not focused on learning with technologies. We are supporting students with computers so that they can better take advantage of an educational system that is at its heart still an idiosyncratic face-to-face, text-based enterprise. All the exponential trends we are riding in technology development and computer use simply do not add up to significant advances in new learning paradigms.

Oh, well. Many students at great universities are doing just fine. The revolution is still just around the next corner.