Chapter 29
Instructional Design, Web 2.0 Style

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CONCLUSIONS

In the previous articles, we reported on the results of a multifaceted research study on how to benchmark and use emerging educational technologies. Our approach blended classic research methods with those used in market research studies. We gathered data and expertise from a variety of sources, including academic research articles, industry reports, interviews with leaders and national pacesetters, and the experiences of our own veteran staff. Our objective was to create a means by which decisions about affordances, constraints, and effective use could be made in a just-in-time fashion. We have only scratched the surface.

To summarize, we conducted a variety of studies across two phases. We looked back at important reports and studies from the United States to identify criteria for effectiveness. To date, there have been few research studies of effective technologies and their use that have resulted in design principles, decision-making principles, or metrics for gauging effectiveness. Of those we reviewed, we found that

they recommended the following learning features: encourages collaboration, increases knowledge and skills, relates academics to workplace skills, integrates into the curriculum, improves assessment/evaluation, and changes the teaching process.

We interviewed pacesetters. Some emphasized that the classroom context and the role of the teacher are the most important objects of study, not the technology. Engagement and interactivity were important themes. Pacesetters cited teacher development and implementation variables. Collaboration via technology was the most often cited technology for future education impact.

We developed a list of exemplars from multiple sources and uncovered their commonalities and design principles. The list included notable trends, such as learning management systems; collaboration and communication; mobility and interoperability; engagement; user-generated content; games and simulations; visualization and modeling; real-time, live events; commercial careers-focused resources; creation of student products; and peer-reviewed, juried educator resources. The large number of teacher resource exchange communities indicates that many educators need and seek support for more

effective integration of technology. The programs represented by this list will serve as an additional data source for future phases of this research.

We examined funding trends from the National Science Foundation, determining the degree to which program solicitations included educational technologies. We also examined the emphasis placed on educational technologies by those who received the awards. Many types of educational technology projects were solicited and funded, with cognitive tutors/intelligent agents and distance learning/online communities the most common initiatives.

In forecasting the future, the executive director of the NASA-sponsored Classroom of the Future program wrote about the potential of real time data, real science instruments in learner's hands, online science instruments, caves and immersive virtual reality, simulations, videogames, 3-D object creation, e-books, and science television, and he ended with a vision for a society fully engaged in science.

In the second phase of this project we took the findings from Phase One and applied them to a new development project. The result was the *EdTech Collaborative* website, which uses web 2.0 technologies to bring the curriculum development community together with classroom users, exploring issues related to design principles, metrics for choosing and using technologies, and the sharing of best practices. In the next section we report on the progress of this development project.

NEXT STEPS

We know from the research literature and conventional wisdom that educational technologies hold a great deal of promise to move inspired learners to the next level, to fully engage them, and to help them to learn rich content knowledge and skills. We also know from the research literature and our own experiences that all too often emerging technologies can be engaging without really be-

ing educational. How do we move ahead if we are delayed waiting for the research to catch up? How do we make reasoned choices when the technologies keep changing? We have to adapt, get organized, and collaborate with divergent communities.

Take podcasting, for instance. Even before any research has come out on podcasting's efficacy as an educational tool, universities have embraced it widely. To create podcasts, a user merely needs something to say, a way to record those thoughts (microphone and/or live screen capture utility), and a means to disseminate the final product. University professors are teaching themselves how to do this. Within NASA, educational video producers and instructional designers are teaching themselves too. NASA podcasts may be downloaded for free from iTunes®, along with lectures on every assorted subject from colleges worldwide. We met with a team from a K-12 private school in Baltimore, Maryland, who taught its science teachers how to create their own video podcasts. To reinforce each day's lesson, these teachers uploaded the podcasts to the school learning management system for students to download. While this may appear to be a revolution, it is perhaps an unfortunate one. That is, while time and energy are being spent on learning the particulars of *how* to do it, these early adopters might be missing opportunities to learn *how best* to do it. Mistakes are replicated every day. Learners are watching or listening to *bad* podcasts among the good. Little is known about the pedagogy, and little will be published for a few years.

Downing and Holtz (2008) phrased the problem like this: "…much of the world is restricted from emerging best practices simply because of a lack of collaboration between educators and information/ communication technology developers… Developers often know what is possible, but lack an application, while educators know what students need, but are unaware of the extent to which technology can meet those needs" (page 10).

We have a solution. In one small corner of this

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