# Educational Technology: Is This What We Were Dreaming?

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A long, long time ago in a galaxy not so far away, educational technology was going through its gestation period. We dreamed of learning scenarios involving multimedia and simulation, where abstraction became absorbed in the discourse and lessons became more poignant, more contextual, and contained more conceptual fidelity. We dreamed of more personalization, more focus, and perhaps even more heart. Our technology would help us build more persuasive arguments, more realistic examples, and more compelling histories.

We had high hopes for our new technology, and the popularity of some early educational software like "Where in the World is Carmen San Diego?," "The Other Side" and others inspired our dreams for the future. Those dreams, if you remember, had a great deal to do with learning and a great deal to do with the students.

Skip ahead twenty-five years or so. What is central to our thinking now? If you are an educational technologist, think about the last few conversations you had with your administrators. What did you talk about? Chances are good that your concerns were either budgetary, related to security (spam, for example), or about network issues. What happened to the dreams about students learning at more mature, more efficient, and more advanced levels? Moreover, let's not pretend that those discussions about security and budgets and networks are about the students, or "protecting" the students. Most computer implementations in schools are designed to use the computer as a reference tool, where the Internet is a "big encyclopedia," or as a fancy typewriter. Very few students are using the computer to engage in real inquiry. Have we forgotten that educational technology is about technology and pedagogy, about not only how we learn, but that we learn, and that none of it will work if teachers do not change?

As educational technologists, we know that direct instruction models are inadequate if we really want to take advantage of advanced learning environments. Most of us have changed the way we teach and have become more learner centered in our approach. But since our conversations with school administrators have to do with security, money, and infrastructure we have little opportunity to become advocates for richer pedagogical models.

One might argue that we had, and still have two tasks to do. The first has to do with students: we have to better understand the evolving pedagogy related to learning with interactive, sometimes intelligent tools nested in a rapidly expanding knowledge base. It is clear to anyone who has taken the time to think about it that interactive models of learning are much, much more elaborate than passive models such as learning to read? Still, while reading specialists argue about the influence of dimensional focus issues on comprehension, educational technologists argue about studies showing no significant difference. Perhaps the complexity of interactive environments is the problem; there are simply too many variables in interactive learning experiences to study them effectively. If that is so, then model building, that is, the building of interactive learning environments, may offer opportunities to help us understand the way students learn. To test these models, however, students would have to be interacting with them in meaningful ways. Teachers would have to be applying

learner-centered principles to instruction. Which brings us to our second task: we have to work with others to help them mount the technology learning curve and apply technological literacy into the curriculum at multiple points. In other words, we have to help teachers incorporate technological tools into the process of inquiry rather than treating technology as a concept outside of their working sphere. Teaching has always been a multi-dimensional activity. One could make the argument that the quality of a teacher depends almost entirely on his or her awareness. For example, if teachers understand Bloom's taxonomy or Multiple Intelligence Theory that knowledge affects their teaching. Similarly, fluency with national and state standards impacts teaching and familiarity with the power of technological tools has its own effect.

Therefore, being an educational technologist means tending to the knowledge community in one's institution. The knowledge system of an institution is somewhat distinct from its memory system. An institution's memory system is related to keeping track of the knowledge, and providing the infrastructure for the transmission and storing of that knowledge. This is important, because many of us have decided, for whatever reasons, to spend our time working on the memory system rather than the knowledge system. We have become service technicians rather than academicians. We have supported one-size fits all networks where all teachers have the same software, and all computers are configured the same way. We have put security above learning, even though most school academic servers have little to "secure." The schools teach a few productivity tools and are satisfied that students are computer literate. Learning, however, is complex, and abstract, and involves decision-making and problem solving.

We need to think less about the dovetail between theory and practice and more about the dovetail between cognition and perception. One of the advantages granted instructors of educational technology is the often flexible stated curriculum. In practice, this means that teachers can set-up learning activities that address desired outcomes in meaningful ways. That is, if an instructor is interested his or her students learning about databases, a project can be designed to accomplish that goal in the context of a larger learning task. For example, such a project might begin life as a research assignment. Each student is going to write a paragraph or so about 10 famous educators. As the students complete the assignment, the instructor might ask “how can we keep track of this information?” Clearly, this data can be thought of as categorical. Why not try to identify categories that are common between the completed assignments: Date of birth, date of death, major contributions, etc. Can we set up a database that includes this data so that we can search for specific people? In one of my graduate classes, I did such a project. My goal was to increase my students’ knowledge of famous educators. I made the initial assignment: collect information on over 100 famous educators. Unlike the example above, my students came up with the idea of a database. In this case, the database was to be online and they had to learn how to set up such a database. Once the students entered their contributions (and they bargained so that each could research fewer educators, that is, they wanted to do the assignment collectively), they felt that it was a waste to keep the information on the local area network. “We want to make this information available to everyone!” So, I suggested a web suite that would disseminate information about Famous Educators. They agreed, and the result can be viewed at http://www.coe.ufl.edu/webtech/GreatIdeas/index.htm.

Fortunately, they decided that the web suite was boring. They wanted to make it a game. At that time, a popular television program gave away a million dollars to a person that could answer a series

of questions. They wanted to create such a game. I told them they had to do the design work. After two weeks of convincing them they couldn't claim to be giving away a million dollars (someone would no doubt want to collect), they came up with the final game. It represents what I call a "soft machine". A soft machine is a device that helps us do a task, in this case the task is learning, that is built entirely with software. You can view the game at http://www.coe.ufl.edu/webtech/Edugator/Edugator.htm.

Finally, the students realized that if a player did not know the answers, they would need a reference tool. The reference tool, of course, was their original "Famous Educator" web suite. One wonderful aspect of this project was that the students carried it forward. They "designed" the project. Students can create soft machines on many levels. Some simple soft machines do a single function and be completed in one or two weeks. To see some examples, visit http://www.coe.ufl.edu/webtech/index.htm.

The point of this example is this: educational technology is a perfect forum for addressing many curricular objectives that have traditionally been problematic. Unfortunately, many educational technology programs do not consider production an important component in the course of study. However, much is lost when the primary activity in an educational technology program is reading. Designing and producing are activities that require a large number of decisions, and a great deal of problem solving. Students have to address time constraints and other trade-offs, and learn that bringing a product to completion is much harder than having an idea. They must collaborate, since not every student is an artist, or an editor, or a programmer, or knowledgeable about all subjects. Consider problem solving, for example. It is difficult to solve problems without making decisions. Technology projects require thousands of decisions and sometimes viewing those decisions in the context of multiple perspectives. We have not cultivated our discipline and have not sought out cross-disciplinary collaborations that might help infuse technology into the larger curriculum.

Somewhere along the way, we educational technologists lost sight of our academic mission - to help people learn. Perhaps we were swept away by the wave of our own learning. Perhaps we were intoxicated with knowledge acquisition; there was so much to learn. It was intoxicating. We became self-actualized learners, learning every detail about devices that produced the greatest explosion in human communication in history. But the overall effect of our lapse in focus has been to slow down the development of good educational software, and to maintain a teaching environment where a large number of teachers don't understand how to integrate technology into their courseware. When teachers don't understand how technology intersects with pedagogy, they undervalue the potential impact of the technology.