The Technological Trigger: Fostering Educational Revolution

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While we live in an Information Society, information technology has barely penetrated the classroom. Not only does it make no sense for every aspect of our lives save education to be enriched by appropriate technologies (e.g., computers, video discs, interactive systems), this technology has the potential to trigger an educational revolution much in the way that the Gutenberg press triggered a revolution 500 years ago. Technology alone cannot fix our ailing educational system. Yet it can be the thin edge of the wedge in giving us the capacity to provide an educational experience that stimulates the student (and the teacher), opens myriad worlds of information, and conforms to what we believe to be best teaching and learning practices.

KEY WORDS: Technology; computers; interactive multimedia.

A CAUTIONARY FABLE FOR OUR TIME

The Htraeling exhibit was a favorite stop at the Intergalactic Zoological Museum and Petting Zoo. The planet itself, Htrae, embodied an extremely rich and diverse environment extending from towering mountains to deep ocean caverns and from seemingly barren deserts to lush jungles teeming with all manner of flora and fauna. Given its modest size, a mere 25,000 miles in circumference, all visitors agreed that Htrae was the prettiest and most interesting planet in the collection.

Even though the visitors came initially to marvel at Htrae’s beauty, it was really the Htraeling civilization—a wonderfully complex melange composed of hundreds of nations and thousands of distinct languages and cultures—that fascinated them. Of special interest was the active and industrious nature of this society. Unlike most societies in the Intergalactic Zoological Museum (IZM), the Htraelings didn’t simply accept their natural environment; they interacted with it, attempted to learn all about it, and even sought to modify it. It was really this social force of understanding and change that distinguished the Htraelings from the other civilizations on exhibit. The quest for knowledge and progress seemed to be universal Htraeling virtues.

The Htraelings were assisted in the pursuit of such virtuous goals by their obvious love for tools and technology. In fact, visitors to the IZM learned that the Htraelings were the descendants of an aptly named ancient race Homo habilis (the human tools users), but the modern Htraeling’s notion of “tool” and “technology” was far advanced from that of his ancient ancestor. No longer were tools just simple artifacts like levers and pulleys that could amplify animal energy. Htraeling tools had even far surpassed the breakthroughs of the Industrial Revolution. What began as an economic revolution focusing on production—and machines concerned with steam and power and energy—had transformed itself into a societal revolution centered on knowledge, information, and communication.

Modern Htraeling society was currently in the midst of this social revolution, known to all as the
Information Revolution. Its most advanced technologies—computers, video, satellites—were all dedicated to the production and transmission of information. Knowledge, and the tools used to help create it, were viewed as the greatest source of both progress and power. In fact, so great was the Htraeling love of tools, and so powerful were those tools, that exhibit visitors came to understand that Htraeling society had entered into a symbiotic relationship with its technology: initially the society shaped its tools and thereafter the tools helped to shape the society.

As much as the visitors were delighted by the Htraeling exhibition, they were also saddened and perplexed by the paradox of Htraeling education: How could a society that obviously put a premium on knowledge and its vast interconnections embrace a static, disciplinary-focused educational system? How could a society that employed many different types of information and symbol systems (video, text, audio, graphics) allow their educational system to be dominated by a single, typographic informational paradigm? How could a society that utilized many different methods for communicating this knowledge trust an educational delivery system that solely relied on teachers to tell students what they needed to know? How could a society that had developed so much exquisite technology for the development and communication of knowledge be satisfied with a classroom in which chalk, blackboard, and textbook were state-of-the-art tools? And finally, how could a society that was being shaped by its information technology fail to see the essential educational role for that technology?

Unfortunately, we are already experiencing the disastrous results that the visitors to the Htraeling exhibit predicted: Declining SAT scores, incredibly high dropout rates, lack of international competitiveness, poor preparation for the world of work, and a general dissatisfaction among all—teachers, students, parents, society. These data tell only half the story. Like all truly revolutionary technologies, we started out to shape information technology—multi/mega media—and it is now shaping us. Without our knowledge, and certainly without our consent, multi/mega media is presiding over the most important cultural revolution since the invention of writing—a transformation from a world dominated by logic and language into a world dominated by the symbol. As we come to realize that the distinctive feature of human beings is our generalized symbol-making ability, our reliance on the written word is diminishing, and we are embracing new modes of thinking, knowledge, and communication.

We now understand these truths: Ideas are constantly in flux. Knowledge is fluid and connected to every other bit of knowledge. Multiple symbol types can help us represent and think about this knowledge. Technology provides many tools for manipulating these different symbols. Yet until education joins the larger Information Revolution, until we revolutionize how we think about teaching and learning, reconceptualize the knowledge students need to learn, and rethink the role technology must play in the educational process, we will have no antidote to protect us from repeating the Htraeling mistake.

THE NEED FOR EDUCATIONAL REVOLUTION

Like the Htraelings, we Earthlings are also in the midst of an Information Revolution: video pictures are sent instantaneously around the world, for a few dollars the phone company allows us to listen in on the astronauts’ conversations from space, powerful computers have replaced typewriters on most office desks, interactive television systems are being test marketed, electronic computer bulletin boards are referred to as communities. The list, often to our amazement and delight, is without end.

Yet also like the Htraelings, we Earthlings are failing to incorporate this revolution into our educational system: Classrooms appear much as they did 50 or 150 years ago. The curriculum is still composed of discrete subjects (language arts, mathematics, history) that are taught at discrete times and in discrete units. Teachers still stand in front of 30 or 40 students of wildly differing abilities and preparation levels and try to command the attention of all. Although this is a generation raised on Sesame Street and MTV, McGuffey’s Eclectic Reader (or its successor) dominates as the chief conveyor of information. Again, but this time sadly, the list is without end.

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