

## The Nature of the University in the Information Age

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President Farrington Inauguration Panel

April 23, 1999

The high visibility of technology-based change in the Industrial Age led to a belief in the positive role of technology in social and economic change. On this front, not much has changed. Technology--specifically, microcomputer-based applications--is the current zeitgeist in American education. From a cultural standpoint, many believe that computers will play a significant role in our transformation from an Industrial Age plutocracy to an Information Age society. Universities, school systems, and legislators throughout the country are revising curricula and adjusting vision statements to place computer literacy and technological know-how at the forefront of system-wide instructional initiatives.

If a successful, meaningful transition from the Industrial Age to the Information Age--with regard to teaching and learning--is to come about, it is imperative that educators strive to discover the most meaningful point of convergence for technology and educational need. Core issues involving the distribution of power and control, the organization and management of learning systems, and the process of innovation must be addressed through a lens very different from the one so prevalent today. Tonight, I'd like to quickly discuss some cultural, some cognitive, some social, and some political ramifications for the university of the new age.

Langdon Winner uses the term *mythinformation* to describe "the almost religious conviction that a widespread adoption of computers and communications systems along with easy access to electronic information will automatically produce a better world for human living." (Winner, 1986; pg. 105) The concept of *mythinformation* is only the latest manifestation of the belief that--if we are diligent and patient--an abundance of today's technology of choice will simply lead us to becoming a freer, more democratic, more just society. For those who adopt such a world view--as many today do--technological determinism becomes an ideal—that is, "as long as the economy is growing and the machinery in good working order, the rest will take care of itself." (Winner, 1986, pg. 108). One may quickly find this sentiment in today's technology of choice--the Internet--and its relationship to what we consider to be the key to freedom, democracy, and justice: that is, access to information.

However, modern technologies such as the Internet often are not as information-rich as we perceive them to be. It is highly likely that, when compared to more traditional sources, the Internet is *data*-rich, but information-poor. But this is not strictly a computer problem—not by any means. The total volume of print doubles every 5 years. 1,000 new books are published—everyday. There has been more data generated in the last 30 years than in the preceding 5,000. Without meaningful context—that is, without connection to people, tasks, and environments--data are often useless, meaningless, and--in some cases--actually harmful. If information is to be the currency of the next millenium, then it is imperative that we develop appropriate strategies, tools, and

techniques for creating meaning from a sea of data. It is this criticality that has become paramount.

Frankly, from a deterministic point of view, the stark possibility of a significant knowledge deficit appears eminent unless we adjust our concepts of authority and literacy. No longer can we assume the words we read, the images we view, nor the sounds we hear have been carefully reviewed, verified, and presented. The embedded authority of information we have counted on in the past is no longer present. Instead, the responsibility for authority, verification, and contextualization has drifted away from the author and toward the reader. The parameters of expertise, validation, and experience--essential components of knowledge--that we assume accompany the information we encounter can no longer be taken as present.

It is important to remember – perhaps now more than ever – that knowledge and information are *not* synonymous. Knowledge is the artifact of practical distinctions—it is spatiotemporal by nature—crafted from experience and cast by particular tasks and contexts. That is, a sophomore at Lehigh is no more likely to gain insights into the intricacies of mechanical engineering by surrounding himself with tools than she is to magically discover the wonder of Keats by holding vigil amongst the stacks in the library. It is now the role of the critical consumer of information to bring the components of knowledge creation to bear upon that which he or she encounters to *construct* or *cast* requisite knowledge. I think it is here where a reasonable investigation of technology within the university experience is necessary.

But I must stress the word *reasonable*. In many ways, the use of technology in education is a solution frantically in search of a problem. There are many in education--as in society as a whole--who have succumbed to the lure of the 'technological imperative'—that is, the need to strive continuously for the broadest, grandest, most complex technical feats currently possible. For those who are guided by a sense of the technological imperative, that which is deemed feasible *must* be attempted. A common result is an insatiable desire for the technologically 'sweet,' and technology, itself, soon becomes the major driver of decision-making.

Such is often the case with educational technologies and their advocates. Instead of approaching technological endeavors from the standpoint of the problematic, many focus on the inherent characteristics of the technology itself as the driving force behind its use within teaching and learning. However, this approach fails to recognize the amount of negotiation that occurs when man meets machine. No technology may be judged as neutral, separate from the social life in which it is used. This is an essential point that we must take into account, for I believe it is this very idea that will guide our vision of what the nature of this place should be like from this point forward.

So, what *is* that vision? Well, from a purely cognitive point of view, we can consider a distribution that manifests itself in two forms--the effects *with* and the effects *of* technology. First, computers can amplify one's processing ability, much like a lever can extend one's physical ability. That is, computers cannot think without humans, and there

are plenty of things humans cannot think about without the aid of computers. Individuals can define the problem space, but certain massive computations require a computer to unearth alternatives, possible solutions, and creative permutations for examination. The cognitive effect *with* this technology results in an amplification of the cognitive ability of the individual (Brophy, 1995).

In the second sense, the interaction between student and computer can result in a cognitive residue that is brought about purely through the relationship between the person and the technology. For instance, computers can not only 'process,' but also model exactly *how* they process, and can map this out in tangible ways for students. New and exciting work is currently beginning in the field of science education, for example, where some are using computer modeling as an explicit tool for teaching not only the process of science, but also the process of *thinking as a scientist thinks*. In principle, over time students will develop the cognitive skills necessary to think as scientists do, and this cognitive residue will be the artifact -- that is, the effects *of* technology.

We have to remember, though, that Educational Technology is still very much in the novelty stage for the vast majority of educators. Most who are using technology in the context of teaching and learning still rely heavily on the use of technology within the context of *existing* pedagogies and structures. As a result, technology is just now beginning to emerge as a significant enabler of new, meaningful teaching and learning environments. Those with vision are seeking synergies and points of refinement between the old and the new, rather than trying to replace the former with the latter. Unfortunately, not all in education are visionary. Many are traditionalists, drawn toward concepts such as "the Information Age" or "the Computer Revolution" as culminating paradigmatic shifts, and toward a belief that the Information Technology-based revolution is the *final* component in a systematic march toward an empowering control over data, information, and knowledge.

One of the obstacles for the successful integration of Instructional Technology into the American educational system is an over-reliance on 'technical' fixes and a lack of receptiveness to a more 'technological' mindset. One group (Papenek and Hennessey, 1977) offers five common ways technical problems are approached:

- 1.) Capitalist approach -- make it bigger
- 2.) Technocratic approach -- make it better
- 3.) Revolutionary approach -- make it an example of exploitation and denounce it
- 4.) Romantic fallacy approach -- don't use it, maybe it will go away by itself (pg. xiii)

What they propose is a 5<sup>th</sup> option, which turns out to be a paradigmatic shift ("invent a different answer")

I think that different answer is not to make technology simply a worthy end in its own right. Nor is it to naively say that it is simply a tool--strictly a means to an end. The point, I think, is as Winner notes, that:

"...the important question about technology becomes, As we "make things work," what kind of *world* are we making? This suggests that we pay attention not only to the making of physical instruments and processes, although that certainly remains important, but also to the production of psychological, social, and political conditions as a part of any significant technical change. Are we going to design and build circumstances that enlarge possibilities for growth in human freedom, sociability, intelligence, creativity, and self-government? Or are we headed in an altogether different direction?" (pg. 17)

Unfortunately, for the former to occur, we must re-think some of the constructs most familiar to us. Infusing technology into university learning environments has done little to change the philosophical foundation upon which success is judged and noted. Replacing "industrial" with "information" simply changes the lexia, but the meaning and beliefs are still the same. The result is a strongly-held belief that expanded information technology within the domain of education will automatically produce a higher quality society--as long as the machinery is kept up-to-date and continues to churn--and that only non-compliance with the laws of technique and efficiency can stop the movement.

What is ignored is the social significance of technologies, and the role they play in structuring human interactions. These interactions are what bring about the kinds of thinking and the level of growth that we strive for at this university. Indeed, learning is *not* downloading, seeing is *not* doing, and teaching is *not* telling ... and pizza and beer *do* seem to be better brain foods when consumed in groups—something about the chemistry of it, I guess. What we must strive for are those technologies that we might call “transparent.” A transparent technology meets the following criteria: 1.) it is familiar, 2.) it is accessible, 3.) it is convenient, 4.) it enables communications and/or interactions otherwise unavailable, and 5.) it allows the *focus* to lie upon that interaction and/or communication, rather than upon the enabling mechanism.

So perhaps it is just a nuance—just a slight change—that really provides the necessary insight. In all likelihood, the nature of the university in the information age will *not* be “teaching you what to do,” as it has been in the past, but rather, to help you answer the question—“What do you do when you don’t know what to do?” That is, when you find yourself in an ill-defined space, and when your existing schemata fails you, how will you proceed? This moves beyond mere skills, clear systems, and ephemeral theories. Indeed, technology allows us to do things differently and to do different things. But that, in and of itself, is only marginally interesting, at best. What *is* interesting is this--as we consider the nature of this place at the dawn of a new millenium, what constructs and artifacts will we create now that will have a lasting impact on the way things will look once our children and grandchildren come here? Winston Churchill once noted that "we shape our buildings and afterwards our buildings shape us." Indeed, our technologies affect the way we view, shape, sequence and generally experience the reality around us. It is for this very reason that we must be diligent, reasonable, and yes—a bit visionary—when contemplating the experiences we intend to provide for our students and for ourselves here at Lehigh. It is with this challenge that we are faced, as we enter a new era for

Lehigh University – and a new era for learning. Can't imagine a better place to be than right here, right now.