

SOCIETY IN THE INFORMATION AGE:
ON EDUCATION AND PREDICTION

by

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ON EDUCATION

In his review of the thinking of Marshall McLuhan, Paul Levinson says: The most famous of McLuhan's missives, characteristically straightforward and enigmatic, was "the medium is the message," one of the best-known and least-understood insights. It meant that the mere use of a medium has a greater impact on society than does any particular way in which the medium is used. The world changed dramatically when people started watching television, for example, regardless of what they were watching.

To what extent does the idea that "the medium is the message" apply to the use of information technology in education? Support your argument with references to course readings.

McLuhan's statement "the medium is the message" was meant to signify that it is not only the contents of a message that has power to change society, but that the medium itself has this ability too (Levinson).

The use of information technology in education certainly has changed the way we teach and are taught today. This quiz is evidence for it. Without the school network, I would not read the questions to the exam online; without my personal computer, I would

write the answers on a sheet of paper. I would not be able to send the answers via email, I would have to drop them off in your office (I just noticed that taking a quiz and emailing the answers to you is different from writing them on paper. The use of email makes it much more personal, as shown by the use of the word "your". This is definitely a change).

When I look back at the past semesters here at Rice, information technology was everywhere. In my two Freshmen Physics classes, we took weekly quizzes online at a website, and our answers instantly graded. In all but one of my Computer Science classes, I submitted my homework by using the "turnin" command; there was no printing, no paper involved. Very few of my classes had homework that was handed out on paper. Most of them, of course, had reading from books, but a majority of them also involved reading articles that were online. Email provides a convenient way to get in touch with professors, teaching assistants and classmates, and instant messaging is even faster and more direct. It is evident that the use of the network to transfer information pervades life at Rice.

All of this, I believe, has made my life more flexible. I have fewer books to carry around and can get to my assignments at any time, anywhere. It is clear that university education is becoming more and more "digital", and the University of Phoenix, as described in the "Drive-Through U" article (Traub), is an example of where this development could take society: A flexible provider of education, providing many locations, that accommodates for people with different schedules who want to enjoy

practical education but would not be able to fit attending a regular university into their schedules. It is only a question of time until the numerous "campuses" the University of Phoenix provides are not necessary anymore and students will have the ability to get lectures and group discussions online as well, if they desire to do so.

As John Seely Brown pointed out, the use of computers and the Internet has also changed the way the "Net generation" is learning. Instead of acquiring knowledge in a "one way fashion" first, and then later applying it, learning seems to have become much more explorative. It now often is a playful series of "what if I change this?" questions. This also leads to the use of bricolage: Quite often it is possible to reach a goal by combining several pieces found on the internet and making changes to them. The anonymity of the Internet also makes it perfect for letting someone learn without making other people aware of this enterprise. There is no classroom, no danger of appearing unknowledgeable, no need to act until one is ready to do so. This might cause people to participate in activities they would not do if they were not online. We talked about this in class: Some of the students might choose not to say something in class, though they would participate in a newsgroup discussion.

The Internet has also created a whole new group of teachers. Amateur teachers who have no real education in teaching but want to share their endeavors can publish articles online and thus teach anyone who happens to find their websites. Almost effortlessly, they get the ability to impart knowledge and become bricolage providers. To some degree, this happens in Rice's newsgroups, where students post answers to

questions of their fellows. I can imagine that this practice has reduced the number of help sessions.

Another article talked about the grim future of higher education (Noam). The direction the University of Phoenix is heading might lead to entire courses that can be transmitted using the Internet to any location of world. From here, it is only a small step to the creation of an independent accreditation agency and "textbook" publishers subsuming some of the functions traditional universities have. This move would certainly weaken the role schools have in society.

Despite all these changes, I do not think information technology has changed education in a fundamental way. There are still books to be read, there are lectures to attend where a professor presents the material in an often unidirectional way, there are assignments handed out and back in.

Maybe I am shortsighted, maybe this gigantic change is just around the corner. From what I see, though, I can tell that it is not here yet. As discussed in class, projectors are only fancy chalkboards. Computers in public schools get replaced every so many years, but don't get used in new, interesting ways. The emails and instant messages students with laptops can send around during class are only digitized paper notes from middle school.

I agree that there are some changes, but when it comes to education, I think the content is still the message, and the medium its carrier.

ON PREDICTION

One of the challenges in thinking about the future is our tendency to hold constant aspects of life that turn out to be quite malleable. Here is an example from an article (which you did not read!) published in the St. Louis Globe-Democrat in 1888: The time is not far distant when we will have wagons driving around with casks and jars of stored electricity, just as we have milk and bread wagons at present . . . The arrangements will be of such a character that houses can be supplied with enough stored electricity to last twenty-four hours. All that the man with the cask will have to do will be to drive up to the back door, detach the cask left the day before, replace it with a new one, and then go to the next house and do likewise. How does the same kind of inevitable shortsightedness show in the papers by Bush and Greenberger? How might Kurzweil be susceptible to the same failing?

When Vannevar Bush described his "memex", he applied some of the recent advances in technology to some areas, but left others unchanged even though history later proved that they changed dramatically.

He allowed for dramatic changes in the way humans interact with machines by making them listen to our voices and even suggesting that humans should engineer a language that is more suitable for such interactions, changes that were never put into practice. On the other hand, while the idea to provide books on microfilm must have been very advanced for its time, he left the information in a format that is absolutely not convenient for machines -- pictures. In retrospect, this seems like an incredible oversight. With all his belief in the power and importance of machines, why did he not foresee a computer's ability to constantly translate information from human-speak to computer-speak and back? He did this with voice commands, why not with the text stored?

Another example of shortsightedness, even though partly caused by storing data on microfilm (which is not micro at all by today's standards), was the physical design of the "memex." Bush believed that dry photography was possible, that cameras would be fast and so small that they could be worn on the forehead without any inconvenience. For some reason, he did not think data storage would become smaller. While you could carry the camera on your body, the "memex" itself did not fit in your shirt pocket. It was a desk.

A few years later, Greenberger made an analogy between electricity and computing. He believed that in essence they were very similar, that widespread use of computers was only a question of time. Even though computers many computers had been produced, which had definitely made production cheaper, and computers had become more powerful, which made computers of the same capabilities smaller, the idea

that computers themselves might be on every desk did not occur to Greenberger. He believed that computers were accessible, but only remotely through terminals; the actual computations would take place on a large time-sharing system.

It also seems to me that he thought of computation as relatively short-lived, that the uses were very specific, limited, customized. This probably stems from the effort that came with programming a computer in the 1960s. Greenberger said that electricity had a large array of products using it; an array of software built for a general-purpose computer did not seem to be on his mind, even though he talked about several uses of computing in banking, insurance, and stock exchange.

In the third paper of this kind, Kurzweil takes a look at what the future of computing might bring us. Again, it is likely that he will apply technological advances to some parts, but fail to adjust others.

He says, for example, that a machine that is as intelligent as a human being has definite advantages in learning, and that humans cannot just download additional information directly into memory. On the other hand, he talks about interfacing man and machine with implants. Maybe it will be possible to directly write into a human's memory; maybe we will find a way to add digital memory to the brain and make it accessible. Either way, fast downloads would be possible then.

Kurzweil also bases the idea that machines will pass humans in their abilities on empirical "laws" that might not hold in the future. It is conceivable that machines will not get smaller and faster, and this could make the threshold of where computers become intelligent hard to reach. I have also wondered if humans can develop something that is more complex, more advanced than a human being. Do one's capabilities not limit the products that can be produced? Maybe all our skills are not enough to reverse-engineer ourselves. Maybe it takes chance, or a Creator, to make life, to make man.

(Questions by Dr. Gorry)

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