Learning to learn in a virtual world

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Abstract

The context for learning and education has altered dramatically over the last few years. We are witnessing shifts that will have a profound effect not only on the social and political orientation of nation states, but also on the ways in which we see ourselves and act upon and within the communities of which we are a part. These shifts will affect how we create meanings, messages and information for the proliferating electronic networks that now surround us. We will also have to re-examine how ideas circulate and how learning and knowledge can be acquired within a digital context.

In fact, learning, as we have traditionally defined it, needs no longer be located within particular or specialized institutions. Learning now becomes an activity of problem solving applied to every aspect of daily life.

The conjuncture of computers, networks, lifelong learning and a vast array of new tools for human interaction variously described through the tropes of the virtual and the cyberspatial, means that teachers will have to reinvent themselves. Virtual spaces generate hybrid environments for the interaction of people and computers. As we negotiate new relationships with these emerging technologies, we are defining new spaces for learning.

This paper will explore the landscape of the virtual and examine whether the many different claims being made for the utility of cyberspace as a learning environment are realizable or, in fact, needed.

I AM PUZZLED.

Here we are at the end of the 20th century, a century marked by some of the most extreme violence that humans have ever seen or experienced, as well as by some of the most important scientific advances in knowledge since the enlightenment. As the millennium draws to a close, we have built the first stages of an extraordinary infrastructure which will enable us to communicate across time and space, using all media, in ways that many would have thought impossible just a few years ago. We are more and more capable of solving problems that seemed intractable when the century began. We are researching the very basis of life itself and unveiling the cartography of the genetic codes that determine our biological make-up. We have gained insights into the way the brain works and insights into our cultural, social, spiritual and economic connections to the environment. In all of these activities, individuals and communities have worked hard to facilitate change. There has been a genuine effort to create and sustain the institutions that are necessary to bear witness to and communicate the vast array of knowledge we now have available to us. This effort has extended in so many varied directions and has involved so many different constituencies, that even those with the most dystopic visions would have to agree that a fundamental re-orientation of the values of Western society has been underway for some time.

And yet, so much remains the same. I have spent the last thirty years as an educator, writer, image-creator and administrator observing and participating in these changes and in this paradoxical stasis. The institution that has changed the least is education, but even as I say that, I know that the educational system has undergone a massive shift. A core element of what education was always about has remained untouched in the midst of these upheavals. And I worry that we have ceased to recognize how profoundly embedded that core is, to the point that the changes being envisioned for the 21st century may not respond to that very history nor recognize what this history has made possible and what it has prevented. It is not within the scope of this presentation to examine the historical legacy of education in the 20th century. However, I do think that we need to clarify whether some of the central assumptions that guided and framed the introduction of mass education in the 19th century have, in fact, changed.

PEDAGOGY AND LEARNING

In an essay written in 1982, the author and educator, Shoshana Felman described some paradoxical statements made by Socrates and Freud on education and learning. In the context of a discussion on pedagogy, they both talked at different times about the "radical impossibility of

teaching." (1982, p.21) A *recognition* of the "impossibility" of teaching, enables and encourages the development of new and innovative approaches to pedagogy and learning. The contradiction is that learning can never be reduced to the way information and ideas are structured for communication. The core confusion is between the authority of the teacher and the authorship that goes into various educational discourses and the manner in which those discourses are exchanged among learners and teachers.

At the root of the claim about the impossibility of teaching is the idea that learning never progresses along a "simple one-way road from ignorance to knowledge." (Felman, 1982, p. 27) In addition, teachers cannot fully anticipate the outcome of the processes of communication and interaction with their students unless the learning process is framed by a set of very narrow concerns. The balance between where students have come from and where they are headed is rarely linear and is often not clear. There is a legitimate desire on the part of teachers to structure ideas and values, and knowledge and content for the purposes of presentation and discussion. What must be recognized is the role of "desire" in communication and teaching, as well as the gap between what teachers know and how well they have come to grips with what they *don't* know. This profoundly affects the teacher's capacity to create a site of learning for students. The same problems and potential solutions apply to learners.

The "radical impossibility" of teaching operates as an affirmation and a negation of the pedagogical activities that contribute to learning. On the one hand, learning is a part of everything we do as human beings. On the other hand, we have developed models of human thinking and models of mind that could best be described as functionalist and reductive in orientation. These models narrow the potential for learning and particularize the processes that make learning possible. "Functionalism assumes that psychology can be adequately described in terms of the 'functional organization of the brain'—much in the way that software determines the performance of computer hardware." (Edelman, 1992, p. 220) It is not an accident that this reductive confusion of brain and mind has gathered strength in the last half of the century (although its roots go back to Descartes) and has been applied to the learning experience. Functionalism simplifies the role of the teacher and of the student. It reduces learning to a series of equations, which end up removing the contingent, fluid and highly unpredictable flow of communicative interactions between learners and educators.

Learning and communications are as intertwined as vision and thought, but more often than not, mechanical models of mind eliminate the complexity that is the ground upon which

knowledge can be acquired. The problems here are not in the availability of information, but in the means used to communicate data, ideas, points of view, and so on. It is not an accident that the classroom and the lecture hall have been one of the primary means of communication in education. The presentation of ideas from teacher to student is not inherently wrong or misguided. The irony is that students in a classroom develop this wonderful phantasmagoria of emotions, experiences, thoughts, daydreams and projections to guide them. This plethora of experiences may not always be visible to teachers, who may be so focused on the content of the communication, that they do not recognize the complex internal world of their students. And this entire process is not helped if a functionalist approach reduces the complexity of what it means to learn.

LEARNING WITH COMPUTERS

So many paradoxes accompany any learning process. Do we rely on external assessment procedures to identify what has been learned? Or do we rely on a more objective set of criteria related to skills and identifiable qualities that learners are meant to appropriate through their exposure to the process? Are subjective claims about what has been learned sufficient? Perhaps the problem <problem> with these questions is in the "what" — is there confusion here between process and result or outcome? I have never been comfortable with the association between skills and learning and the contiguous assumptions about learning and training. Have these terms crept into the vocabulary because we remain so unsure about the meaning of learning? I think that the answer is yes. Vast amounts of money are being pumped into skills development with little substantive reflection on the differences between skills and learning. The assumption is that they are fundamentally the same. The further assumption is that without a set of generic skills students will not be able to function in the modern world. The irony is that most students now arrive in school with a vast body of knowledge and find that it is not really applicable to their experience in the classroom. For example, although television has been around for close to fifty years, we still react to its presence in an antagonistic fashion. Yet, students learn a great deal from their experiences of viewing. The incorporation of those experiences would alter many of the presumptions that we have about curriculum development. For the purposes of this paper I will, rather than exploring this issue in detail limit myself to commenting on the rather quick move that the educational system in North America has made in the use of computer networks for teaching and learning. I believe that the speed of this shift is directly related to a functionalist metaphor and

it signals the degree to which the core assumptions which I have been examining have simply been incorporated into the new educational networks that are now being built.

THE COMPUTER'S MEMORY

The ease with which our culture has internalized the metaphor of the computer as a thinking machine is perhaps best expressed by the notion that computers have memory. The anthropomorphic conferral of so much power to the computer has had an impact on the ways in which we think about learning. It also reflects an historical heritage that links learning to information. The move from information to understanding, let alone from information to knowledge, is very complex. One should keep in mind that the metaphors of memory in use here, influence the way information will be structured for the purposes of comprehension and communication. In addition, we have to be very careful about the assumptions that go into the creation of information, both for the classroom and for networked forms of education. Otherwise, we may end up reproducing the functionalist precepts that innovators like Paolo Freire (1970) so convincingly critiqued some thirty years ago. Has the metaphor of the computer itself become convincing grounds for so many of the assumptions about the efficacy of the learning process? Or has the arrival of the computer allowed us to hide the underlying reductionism that has governed the educational system throughout the 20th century? This is a key question and one that we may wish to debate. Perhaps we need to strip away the many layers that we have built onto the communicative infrastructure of the classroom, or perhaps we need an entirely different model.

In some respects, as the memory of a computer fills up, it takes on more and more of the characteristics of the user. The hard disk becomes a compendium of work, writing, software and general information that reflects the orientation and selectivity of the human behind the computer. The personalization of computers means that they are not simply tools. The pragmatic use of computers puts them, more and more, into the category of companions. This phenomena alone (and I have only described a small part of the relationship) contributes to a modeling activity that links the thinking human with the thinking machine. Unfortunately, it also leads to correspondence theories of mind and machine and reinforces a cultural tendency to transform the mind into a mechanical device. (Searle, 1999)

NETWORKS OF LEARNING

Another facet of this linkage of mind and machine, is the extension of the computer into a networked realm. The concept, the idea that we can connect to any part of the world through our computers (as well as through a plethora of other devices from telephones to televisions) is as important as the fact that we are involved with networks on an everyday basis. I am speaking here of networks in the broadest sense and of the evolution of communities away from narrow definitions of locality to more expansive notions of connectivity. "Networks constitute the new social morphology of our societies, and the diffusion of networking logic substantially modifies the operation and outcomes in processes of production, experience, power and culture." (Castells, 1996, p. 489

These are very general claims, but the point is that even accounting for the specifics of gender, class and ethnicity as well as the particularities of national identity, our culture is 'thinking' about connectivity as if we have uncovered a new model of mind. When Castells (1996) talks about a 'new social morphology' he is referring to both structure and form. Structure refers to organization, while form speaks to history. In both cases we are dealing with evolution and a Darwinian process that suggests something about nature, change and the social context of struggle and survival. Castells explores all of the elements of a changing 'morphology' without grounding his comments in theory. The characteristics of connection are not solely located in the phenomena that have been generated. He mentions the modification of experience that networked environments make possible. As well, he talks about the transformation of our culture. It is clear that to Castells, the outcomes of the connection process are so fundamental that our very sense of who we are is being rearranged.

The impulse to describe a 'networking logic' is part of an evolutionary paradigm destined to locate human thought in functional terms. Generally, to extend what I have been saying, a functionalist approach envisages thinking and hence the brain itself, as a series of algorithms. The brain becomes an information- processing machine that uses mathematical sequencing to solve problems and responds to a set of instructions that are embedded in our neuronal structure. This, then, is the 'logic' Castells (1996) refers to, which goes to the heart of a new organization of the brain into parts with different functions. The trouble is that Castells postulates these links without *explicit* reference to the human mind and to processes of thinking. The 'logic of the network', as a statement, encourages a naturalized linkage between connections and what human beings do with

connectivity. As we shall see, the same logic has been applied to learning as more and more of the learning activity is situated within computer-mediated contexts.

As the functionalist model gains in strength, the computer increasingly comes to stand in for more and more aspects of human thought. The initial metaphorical strength of the computer-human connection takes on a literal character. *Deep Blue*, the computer that defeated Garry Kasparov in a chess series, is now talked about in almost reverential terms, even though the programmers who designed its software are quite skeptical about many of the cultural claims that have been made for *Deep Blue's* intelligence. Murray Campbell (1997) who helped to develop *Deep Blue* suggests that, although the computer plays chess better than most humans, "excellent chess play also requires imagination, intuition, ingenuity, and the passion to conquer." (79) Crucially, *Deep Blue* is "unable to appreciate its own moves." (91) This lack of self-awareness is fundamental to the difference between computers and humans. It has implications for how we envision what computers can and cannot do and to what degree the computer is seen as a stand-in for human beings.

THE PERFECT TEACHING AND LEARNING SYSTEM

Imagine a perfect teaching and learning system based on computer-mediated technology. What would it look and sound like? From a pedagogical point of view, the system would have to be sensitive to the profound differences between students. It would have to be capable of distinguishing among many varieties of human responses in diverse and sometimes unpredictable circumstances. It would have to understand how human beings are able to make jumps in logic and are able to explore their own thinking through imagination and daydream. The system would have to contain enough variations to be able to respond to questions that had never been programmed into it. Its internal architecture would have to grow with the students it taught or informed. In other words, it too would have to be capable of learning. The computer would have to be erudite enough to anticipate the direction students take when they discover new ways of understanding familiar issues. It would have to be capable of comprehending ambiguous statements that might contain the kernel of an important thought, without jumping to the conclusion that the students have not understood the work they have been assigned. The computer would have to incorporate a general understanding of the importance of evaluation and self-assessment in the learning process. It would have to be able to understand the subtleties of reasoning that often guide the thinking process into unanticipated realms of thought. It would have to be inventive and yet not too innovative for fear of

leaving its students behind. It would have to recognize patterns of student emotion that often hinder clarity of thought and efforts at problem solving. It would also have to distinguish between the truth and the not so true. It would have to respond to ambiguity by recognizing the relationship between memory and language. Not everything we say is informed by what we consciously know. In some senses, the computer would have to emulate the role of the teacher in a classroom in order to generate some sense of dialogue and conversation. It might be the case that the computer will have to enter into arguments about existence and the meaning of life in order to find some common ground with students who are asking foundational questions about these very notions. The computer will also have to take stock of the lessons in which it has been involved and be able to sum up the total of its experiences as a teacher.

To be honest, it would take a much longer inventory to get close to some sort of perfection and I have set a task for the machine here that would not be expected of most teachers themselves. It is interesting that even the most utopian models of computer-human interaction (largely represented by the work of Raymond Kurzweil, 1999) hesitate when it comes to self-awareness. The simple symmetry of machine and human does not seem to work when the most basic questions are asked about knowledge. Now, having said this, I am willing to concede that the extraordinary proliferation of sources of information and contact across the web and through e-mail are potential sites of learning. The construction and growth of the Internet is one of the great achievements of the 20th century. It is also the case, that from research activities right through to electronic commerce, the web is opening up new horizons, as well as making it possible for human beings to interact and communicate in fresh and unpredictable ways. It is perhaps too early to assess what we are learning and how the experience will change our culture and ourselves. The problem is, that even if we qualify human-computer interaction, the growth of information sources seems to suggest that the link to the educational process is natural, if not inevitable. It is this simplification that I would like to question in order to avoid some of the fundamental errors that introduces into learning activities. What worries here is that the technologies we are using to connect learners may constrain, if not overwhelm, the fragile cultural faith that we have in the experiential base of learning. We may thus end up creating training environments for narrow-based skills, oriented towards goals that can be quickly attained, rather than contribute to the growth of genuine learning environments. I fear that our assessment of what is important from an economic point of view will weaken our resolve to create contexts for innovative ways of seeing and thinking.

A more optimistic perspective, however, is that the new networks of instruction we are creating will foreground the richness of human knowledge and eventually bring that complexity into a fresh and exciting context. I think about the creation of a public commons where these ideas can be debated with some effect on policy. I hope for conversations among students that are not directed towards a particular end, but revel in the pure joy of learning for its own sake. And, in the face of reductionist attempts to define teaching through a variety of mechanical metaphors, I would like to believe that "instruction" will slowly move away from its present command structure and towards genuine interactivity.

An overwhelmingly pragmatic attitude has taken root in our culture with respect to learning. It is simultaneously holding onto some of the most conservative traditions in education, while proposing revolutionary solutions that will allow for a growing segment of the population to gain access to more and more information. This is why terms like 'educational provider' or 'delivery' appear over and over again in the literature. It is as if learning is about receiving, as if information is about delivery. Access means nothing if there isn't a foundation upon which the information can be transformed into knowledge, and it means very little to gain access to an archive if one has no connection to, or understanding of, history. It is here that the *concept* of a networked connection has overwhelmed and perhaps obscured our ability to explore what connections actually mean. The conventional classroom is a living laboratory of the contradictions, potential, and unpredictability of connections. Why have we not *learned* from that experience and applied that learning to radically reinvent the structures that we are creating for technology-mediated educational experiences? Freud and Socrates were right. The 'impossibility' of teaching is situated in a fear of fragmentation and breakdown, in other words, the flux and flow of contradictions that may have no immediate solution. Teaching, as much as learning is about the struggle to keep these issues in the foreground, and to keep the conflict between all of these factors rebounding against each other in a productive manner. The people who are building technology into education and learning, will have to heed these lessons. Otherwise, we may end up reproducing the very structures of learning that have inhibited fundamental change from occurring in the first place.

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