NEODIDAGMATA 29/30
POZNAŃ 2008

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SHIFTING THE CENTER TO THE MARGIN: ONLINE LEARNING AND SYSTEMS OF CONTROL

ABSTRACT. Muffoletto Roberto, *Shifting the center to the margin: online learning and systems of control*, "Neodidagmata" 29/30, Poznań 2008, Adam Mickiewicz University Press, pp. 39-54. ISBN 978-83-232-1908-8, ISSN 0077-653.

This essay will argue that before we can fully understand the potential of the existent and emerging communication and information technologies for online distance education, we need to consider their impact on schooling, teaching and learning. The conversation on distance education must be grounded in the historical, social, economic, and political interests related to developed and emerging networked digital systems that guide the visions and definitions of education, if not reality. Not to do this, will continue to repeat the past, the unfulfilled promises of education and media, and to relive history. To accomplish this is no simple matter, for to unpack and understand reality, its history and current practices, and to break from the common-sense discourse on schooling, is complex and demanding. It might be best said that this essay will stake out the territory, the map to be covered, and not provide answers to questions that need to be asked. Even though the perspective offered is one informed through experiences and reflections with the educational system found in the United States, there are similarities found in most western countries. In the end, this essay will consider two paths for education relative to networked digital media and Internet based distance education.

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INTRODUCTION

Historically media technology and system technologies have been framed as progressive, modern, and beneficial to the schooling process and society in general. Public education in the United States, since the turn of the 20th century, has been engaged in a debate as to its purpose; "who" it serves, and how to efficiently and effectively deliver its services. As we enter the first part of the 21st century, the debate continues as to the purpose of

public education and its format, with the addition of networked digital technologies: current and emerging hardware, software, and systems, and the Internet. Add to this the growth of global information and communication systems primarily via the Internet, and a growing borderless migration of business interests and political agendas, and you have a complex array of interrelated forces that effect not only the learners and teachers in public education, but the horizon line of social world possibilities.

Near the center of the current debates on the future of education are questions related to the integration of networked digital technologies into the day-to-day life of students and teachers in the classroom, on the campus, and to the extended campus in a student's home, workplace, or cafe. Central to this discussion is a vision for education, a vision positioning the teacher and the learner at the center of educational initiatives in building learning environments or instructional ones, dynamic learning communities or individualized instructional programs.

A "technology of education", a pre-defined scientifically designed system (as compared to situational systems where the system evolves as the situation emerges) where digital devices and programs deliver the curriculum to students, while at the same time positioning classroom teachers at the margins of the process. A "technology of education", is concerned with pre-defined outcomes, centralizes control of content and the learning process by others outside the classroom and the community.

"Technology in education" draws from a constructivist postmodern perspective where knowledge is understood as an historical social construction, positioning the learner in relationship to historically shaped knowledge, others (them) and the constructed self (subject). Digital media/technology (hardware, software, and ideology in practice) is used to explore and inquire into the notions of knowledge, truth, and constructed meanings from a learning community perspective. In a learning community you are never alone, never an individual within a crowd, but an individual who is formed and shaped by others, while shaping the other.

The debates concerning the future of public education and emerging various digital networked environments in the United States may be framed as either student/teacher centered or system centered. The difference is found between the concept and practice found in a "technology of education" or "technology in education".

Not far from the center of those debates are questions concerning the locus of control over the teaching and learning process. (Kliebard 1986) "No Child Left Behind" as a technology of control, is a prime example of a controlling system, is presented through various administrative discourses based in accountability, efficient use of economic and human resources, and

the public good. Improvements and innovations to teaching and learning are couched in student centered and "life time learning" debates. Found in these discourses are visions of technological determinism, painting a brighter future for students, teachers, and the community in general.

This essay argues that before we can fully understand the potential impact of the existent and emerging communication and information technologies on schooling, teaching and learning, no matter if it is in a traditional space and time bound environment or in a virtual online environment free of space and time, the debate must be grounded in the historical, social, economic, and political interests that guide visions and definitions of social reality. Not to do this, will continue to repeat the past, the unfulfilled promises of all new media, and to relive history. To accomplish this is no simple matter, for to unpack and understand reality, its history and current practices, and to break from the common-sense discourse on schooling is complex and demanding. It might be best said that this essay will stake out the territory, the map to be covered, and not provide answers to questions that need to be asked. In the end, I will point to two broad possibilities for the direction of "online educational environments" as information and communication technologies (systems) evolve within a shifting global economic environment (Friedman, 2005) and a political discourse of benefit and national interest. In order to accomplish this, a context for thinking, or framing of educational discourses related to online distant education, a few comments on the history of media and media technology (systems) in education are in order.

TECHNOLOGY AS A SYSTEM

Before World War Two, the new media of instruction was primarily termed as "audio-visual". This construct included a range of what was then understood as "new media": stereo views, radio, overhead projections, silent and sound films, to name a few. Central to the employment of the new media was the teacher. The teacher, who for all practical purposes made the pedagogical and curricular decisions in the classroom. Behind closed doors the classroom teacher would, like an "artist", construct the learning environment. It was not till later that the teacher as "conductor" was required to follow the score or script, with little room for interpretation and innovation. This is an important point to consider; before the mid 20th century, teachers in the United States were primarily in charge of the day-to-day delivery of a curriculum, after World War II this changed drastically. This is not to say that systematic efforts were not made before the 1940s to monitor or control

the behaviors of teachers, quite the opposite. Through defined curriculum, limited textbook selection, and other instruments of control, the monitoring of teacher behavior and their delivery of the official curriculum, the system attempted to steer life in the classroom. (Apple, 1979, 1986; Callahan, 1962; Cuban, 1986).

After the 1940s we witnessed the merging of three fields: engineering, psychology, and education. Combined, they formed the foundation to the field of instructional technology. Engineering provided the conceptual boundaries related to system management and the design of various information and communication devices (its roots will be found in social engineering and visions of the public good). Psychology, based in a neo-behaviorist, operant conditioning paradigm, provided the learning theory by which the system would evolve. Education provided the purpose and reason. Together, they offered a "technology of instruction" based upon concerns for control over the teaching and learning process. (Skinner, 1968) This technology of instruction gave birth to instructional and educational television, self-paced programmed instruction, (the Skinner teaching machine and later the instructional kit or package), various media kits that were self contained learning programs, computer based instruction, and most recently "integrated learning programs". In many cases, in the modern classroom, the role of the classroom teacher was only to keep the learners on task, start the program, and manage the learning environment. It is important to note that the classroom teacher was not central to design and delivery of the curriculum. (Cuban 1986; Muffoletto 2001) Technologies of control are embedded in the discourse as well as the system. The foundation of the "No Child Left Behind" initiative is a discourse of rationalization for school improvement that supports the system; it is the system that is steering contemporary education in the United States. (Heidegger, 1977; Muffoletto, 2007).

For example, in the 1980s, a spokesperson for instructional technology, Robert Heinich (1985), argued in the Association of Educational Communication Technology's research journal (*Educational Communication Technology Journal*) that in order to improve education we did not need classroom teachers. To improve the effectiveness of the schooling process, Heinich argues that we need educational engineers over teachers. It was a period when education turned to scientifically and systematically designed instructional delivery systems over the perceived uncontrolled variables of teachers and their day-to-day classroom behaviors. This pedagogical and political position mirrored the attacks on the teaching profession. The public attacks on teachers in the 1980s once again questioned the ability of teachers to teach effectively and provide instructional leadership. This period in the

United States produced an array of state level "teacher test", various mass mediated attacks on teachers, and further attempts to control and limit the actions of teachers in delivering the curriculum. State test similar to the North Carolina's ABC end of year test, and the current federal NCLB are examples of attempts to systematically monitor and further control the classroom teacher, with the publicly stated intention of improving the effects of schooling on the education of students. Most of these arguments were, and still are made in the name of efficiency, effectiveness, and accountability, while meeting the needs of the changing American society.

The second half of the 20th century witnessed the launching of Sputnik, the cold war, global economic competition with Japan (and now the EU, India, and China), the struggles of oppressed classes to bring social equity and justice to the United States, an unpopular war (Vietnam), and the development of small affordable computer systems, high speed communication network – the Internet, the engagement of business interest on a global scale, and a growing concern over immigration from Central and South America to the United States. (Friedman, 2005; Muffoletto, 2001) The world also witnessed the end of the cold war, the opening of the Berlin Wall, and the growth of terrorism.

Schooling over this period fell more and more under the control of those outside the classroom. Through the use of state requirements, the flow of funding, the discourse of "life time learning", and public opinion concerning the effectiveness of schooling on the future lives of their children, a façade of educational reform was taking place. (Popkewitz, 1982) The vision of those outside the classroom was to control the content and delivery of the curriculum through standardized curriculums and outcome-based testing, while at the same time maintain the status-quo of the social economic system which provided a labor pool to an ever increasing technology driven economy. (Apple, 1979) In short, the effect of schooling had to remain the same, the United States needed a labor pool to feed the low status, low pay occupations, especially located in the growing service industries and, an increasingly global economy required an affordable and flexible labor pool within the national boundaries. In the 1990s the "Iowa Business Roundtable", similar to other state business panels, outlined the needs of changing business landscape and its labor pool for the 21st century. These recommendations would eventually find their way into the classrooms and curriculum, as well as the minds of students, teachers, administrators, and parents.

One result of the last decade of the 20th century was the attempt to redefine the term and definition of the classroom teacher. For example, when teachers are defined or framed as "coaches", "facilitators", "guides", and "instructional leaders" each term brings with it its own paradigm of mean-

ing, practice, and expectation. The emergence of digital information and communication systems (driven by the computer processor) provided new horizons for a broader and deeper form of control over the actions of teachers and students. The "World Wide Web", the Internet, provided further the opportunity for a singularity of curriculum, its delivery, and ways of valued knowing through the dissemination and consumption of "ways of knowing": distance education. Digital technologies and the Internet, from another perspective, provided the fruit, the fertile ground, for a learning environment that placed learners and teachers at the center.

TEACHERS, COACHES, AND GUIDES

In the 1980s the teaching profession witnessed vicious assaults through the form of state teacher exams and mass media attacks. Coupled with low pay for their educational status, a loss of faith and respect by parents and students, an "outcome-means-end" rationality based system, collectively contributed to the current conditions facing the teaching profession and the exodus of many of its valued members.

At the turn of the 21st century, the teaching profession in the United States noted losses of 50% of its members every five years. To fill this gap with educated personnel efforts were and are being made to draw individuals to the classroom through alternative entry portals and not the traditional teacher education route. Very little of the public discussion on this exodus, of so many qualified and experienced professionals, focused on the reasons why teachers were leaving the profession. It appeared that various levels of state and federal leadership believed that it was easier to take advantage of the shift in employment patterns (less full-time work, the closing of business and loss of opportunities, and less high paying jobs) to draw people to the profession instead of using resources to improve the conditions from which teachers were escaping.

At this point a few thoughts need to be given on teaching as a profession and career. As early as the first decade of the 20th century the skills, abilities, and attitudes of teachers were called into question. The quest was to control the behaviors of teachers, who were seen as pro-child and liberal thinking (this was a time of urban industrial growth, influx of immigrants looking for a new life, and concerns over child labor issues, as well as the growth of socialism). (Callahan, 1962) Early media research compared the delivery of curriculum by a mediated audio-visual program to its delivery by a live teacher in the classroom. Later, teacher effectiveness was compared to the effectiveness of educational film, radio, television, programmed instructional kits and later computer delivered instruction. (Usually there was

noted no significant difference in these studies) As time passed, the term "teacher" was challenged by the use of labels, redefining their identity and role in the classroom. Teachers were labeled as coaches, guides on the side, teaching scholars, and other configurations, but not as teachers. (Cuban, 1986, Muffoletto,1994).

It may suffice to say that teachers were viewed as the weak and uncontrollable variable in the instructional/learning process. (Callahan, 1962, Cuban, 1986) Basically, students were viewed as the raw material to be formed and shaped, the curriculum, which was scientifically designed by content experts and instructional designers from outside the classroom, with teachers being the unknown element in the formula. These conditions created the justification for the broader use of the technology of instruction, the systematic control of the curriculum, its delivery, and testing through various devices, mainly computer delivered programs (consider the arguments and rationale behind the use of instructional television and computer delivered and managed learning environments). The system was set in motion for the development of a national curriculum delivered via the Internet.

Consider for a moment, these conditions: Teachers teach to the test to gain not only a pay raise, but the respect of their community, (school report cards were published without any in-depth description of what the data meant); teachers in many cases needed to carry a second job to make ends meet; when students do not pass the test and the school shows no improvement, the teachers (and then the administration) are suspect; teachers are leaving the profession.

The above scenario may be read as follows. Teachers have not been trusted by society in general, and thus blamed for the problems of a non-effective educational program – who or what else is there to easily blame. Throughout the last century institutional attempts have been made to lock in and control the work of teachers. Because of working conditions in the schools and classrooms, teachers have left the profession to find work in other areas. Balance the professional exodus with society's inability to attract replacements to the profession through historically normal channels.

Parents and communities, especially the working poor and the middle class, believe that education will provide a "way" up and out to a better life for their children. Now, add to the mix the development of computer technologies, the Internet, and information and communication applications and resources, the development of curriculum and its delivery by perceived experts and instructional designers, and you have an interesting combination of conditions. Conditions, I believe will lead to a national curriculum, the redefinition of teachers from grades 6-16, the broad use of digital information and communication systems, and the continuance of the status-quo.

COMPUTER TECHNOLOGY AND THE NET

A few words concerning technology are needed at this point. From its early formats in education, those behind the employment of media and media technologies (hardware, software, and systems) in education have promised improvements. Salesmen, backed by research and a passion for profit, have sold countless programs, kits, and procedures to school administrators in the hope of improving the learning of their students; little ever changed on any meaningful scale. Cuban, L. (1986) and others have pointed to the institutional constraints limiting the vision from being actualized (Apple, 1979). But I believe the situation goes deeper than that, schools are doing what they were always meant to be doing, that is maintaining the status quo of a class-based economic system, and one of benefit and privilege. (Kozo, 1991).

The last few decades have experienced (primarily in western culture) the massive growth of the knowledge industry, the processing power of computer chips, the adoption of technological solutions, and what some may have expressed as "posthuman" developments in human-technology interface (brain implants have arrived.) In any case, we now have the potential with current communication and information technologies to design, develop, and activate various learning platforms and environments. For example, enough is known about the cognitive and learning conditions needed in traditional and online learning environments for the learner to be successful (success is defined by the system), and the system required needed to "make it real" (both the conditions and systems reside within specific assumptions, beliefs, and purposes of education. For example, an environment designed within a behaviorist paradigm would look and feel different from one designed from a social constructivist one). We can develop online virtual learning environments (including those in Second Life and Active Worlds, and use various simulations within a learning environment), deliver individualized curriculums, and support integrated learning systems. We, as a society (the United States, and I would include the European Union), know how to design schools and classrooms based upon solid environmental and cognitive learning requirements. But we haven't. Consider for a moment the choices that can now be made related to digital technologies, pedagogical methods, and the definitions of knowledge to change the schooling experience of children and adults.

If teachers, and the system in general have been labeled as ineffective, out of date, and non-responsive to the needs of the business community and the public in general, to whom (what) does society give the power and responsibility for the education of its youth?

If there has emerged a lack of trust, a loss of faith in schooling, teachers, and the system in general, would a wise social system give public education more control and power over the futures of its children? If for years, I as a parent, a business leader, a member of a specific community, I have heard, and maybe experienced, the problems facing children and schooling in the United States, why would I give more control and power to teachers; the profession that has been pointed out, in various ways, over and over again as a major part of the problem? Would I as an inner-city, low income, if any income, parent feel good about sending my child to my local school which has a history of under-funding, shifting instructional staff, unsuccessful educational programs, and at times a violent environment, or would I want to send them to schools located a few miles away from my community where life looks "so" much better, safer, and futures for my children appear brighter? (Kozo, 1991) From this perspective home schooling and online educational programs have a certain appeal. Parents and students have an array of choices (or will have) as to how they receive their education. No longer are students, young and old, limited by geography and time. Students, of all ages, in Poland as well as in other countries, are not any longer restrained by national borders, the cost of travel, and living close to an educational center. Students do not have to be submitted to the traditional form of teacher and curriculum centered learning environment. As opportunities evolve on the Internet for collaborative and cooperative learning environments and learning communities, students will have the opportunity to study with others from different cultures and social horizons. In this manner, the educational system will have to respond and evolve if it is to remain worthy of public faith, appear to be progress, democratic, and modern.

If given the choice, parents and communities would lean heavily towards what they believed, or have been led to believe, in a "system" that would provide their children with a knowledge and skills foundation to have a better life. (In the United States in the late 1980s and 1990s the emergence of an educational voucher system, magnet schools, and cross and inter-district busing was promoted as a solution to the struggling educational environment as well as racial inequalities found in many cities and rural communities.) A better life translates into a good job with a good income. Need I add that "the" system is born out of science and instrumental rationality, is ideologically linked to progress and social control, and founded upon the belief that individuals need to take responsibility for their own behavior and future. That is the beauty of "No Child Left Behind Act" (NCLB). Who can argue with the concept embedded in the title – no child is left behind, the concept of setting standards and rewarding those who meet and excel beyond the established boundaries, standards determined by government, educational and business leaders.

The end of year test (pre-determined outcome performance behaviors) has come to define the nature of knowledge and learning, as well as good teaching and quality schools (school report cards). The NCLB is perched to make schools responsible for the American dream, at least in rhetoric. (For schools that failed to show improvement over previous test scores, teachers and then administrators were posted as the cause. Rarely was the system itself called into question.) The system is now in place for legitimating a technology of instruction built upon the digital delivery of education in a standardized and scientific manner, and to be embraced within the walls of traditional classrooms or via the Internet as distance education. The outcomes are set, teachers will be redefined, the system will teach, teachers will be the guide on the side, the coach, and manager, and students will continue to be the raw material to be molded and formed to meet the expectations of a society.

THE QUESTION

I believe that the question comes down to this: What are the forces, the ideological horizons, that will determine (and have determined) the future direction(s) that public education will travel. Understanding the history of education in the United States, the relationship of schooling to business, industry, and various communities, will open many avenues for understanding and defining the question. At this point in our educational and technological evolution, we are capable of inventing innovations that use digital technologies interfaced with learners that would change the heart of education and their futures. We, and we being "us", have visions and ideas as to what an education system could look and feel like in a democracy. We do not need a "Second Life" to live the dream (even though there are wonderful possibilities offered through virtual environments, providing us with the ability to create learning environments that are dynamically different from what we now have).

TWO SCENARIOS[1]

Much of the professional literature, faculty development materials, and school initiatives (I am including k-12 and higher education in my consideration of public education in the United States) take two perspectives when it comes to computer related policies and educational practices. The first is

[1] The two scenarios presented here had an original form in an earlier publication and were modified for this manuscript (Muffoletto, 2006).

grounded in the system management arena. The system delivers the curriculum and evaluates the learner in an efficient and effective manner through digital networked technologies. The second format is to provide teachers with the education, the resources, the working environment, the administrative and community based support that is open to innovative solutions and challenges to making schools work for all children and communities. To be open to possibilities offered by a global education, virtual worlds, and a constructivist student centered collaborative learning environment.

At the start of this essay I suggested that there exist two possible directions (among an array of variations and discourses) for schooling in the United States (as well as other educational systems, the key word here is system) to take as we slowly slide deeper into the 21st century. A brief example of both may suffice at this point. The first portrays a direction based upon the use of technology as system to manage the curriculum, the evaluation of the learner, and offer prescriptions for future action. The second will sketch a picture that is collaborative and global, using the developed and emerging information and communication technologies to construct a learning environment over an instructional environment. In both cases the definition and behaviors of teachers and students are redefined within a world of emerging possibilities.

SCENARIO ONE: TECHNOLOGY AS AN INSTRUCTIONAL SYSTEM

Considering Heinich's call concerning the need for educational engineers over teachers, the standardization of the curriculum similar to the efforts of NCLB, the development of computer based integrated learning systems, and the redefinition of "what" teachers do, a look into the near future could envision a national school system driven by simulated, computer generated teachers (avatars), where learners work through the curriculum, in concert with scripted and packaged curricular materials; not too different in concept, but far more elaborate and effective than the teaching and testing programs delivering the curriculum and learner evaluations found in the 1960s. The teacher's role in this general case is to provide the emotional support, provide over-all management of the environment, and when the program cannot respond to the needs of a learner, search with the student for additional or supplemental teaching materials. If the system is designed correctly it will be an intelligent system, that recognizes the learner and their needs, identifies pathways for the learner to take to meet the objectives of the curriculum, provide evaluation reports to the learner, the system, and

to the parents and community. At this point, intervention by an "agent" or "advisor", will be necessary to explain to all parties the meaning of the reports and what future actions, or prescriptions, will and should be taken. (Similar to a life insurance agent who explains to the client the meaning of the data analysis collected from them, leading to the recommendation to purchase one of the company's products.) (Garason, 1989) As one can imagine in this scenario, the system defines the students as she or he taking responsibility for their own learning (The history of self-paced instructional packages provide us here with a context for the future use of instructional systems delivered over the Internet). The picture is not one where students are frozen to their seats working through text based, fragmented curriculum objects, but one that is media rich, highly interactive, connected to the global information network, challenging, and not judgmental. The system does not watch over the student's shoulder, but works in collaboration with the student as they, together, work through the learning process. In the end the student, the parents, community, and the system know if the students have met the pre-defined objectives of the schooling process. They, and the student, will know if the student has gained the knowledge and skills that were tested for. In short, it is the test and the test makers, defining learning.

Similar to the second scenario (below), the student may access the system from any location with broadband access. She or he may be working with others in collaborative projects and inquiries. The difference being the standardization of results, ways of seeing, and the setting of horizon lines: the system sets and defines the boundaries of legitimate knowledge and steers the "ways" of knowing, defining the definition of what it means to be a learner and who in the end is the teacher. This is a critical difference between the two examples. From one perspective the system defines the nature of knowledge as fixed and repeatable. The other positions the nature of knowledge as an historical social act, emerging out of a community of learners, where knowledge is not fixed, but is understood as fluid and emerging. I believe that it is important to note that both are examples of pedagogical paradigms, each with their own history and struggles.

SCENARIO TWO: TECHNOLOGY USED WITHIN A LEARNING ENVIRONMENT

The second scenario provides a look into the future, where schools have been re-defined, as well as notions of knowledge, teachers, and learners.

It was a sunny morning in Berlin, Germany. Ursula, a 17 year old, the daughter of German-American parents, arrived at her learning center.

Learning centers are common in year 2050 where the curriculum has come to reflect a historical global perspective, providing learners with ideas, experiences, and opportunities to understand themselves in the world. Even though Ursula is connected to what information and communication networks she requests, she, like most students, attend a learning center to develop social skills, meet people who live in the same geographic area, take part in sport activities, and just "hang out" with others her age. Most of her learning can take place from anywhere in the world, it is the sharing of physical space, a sense of social presence in a physical world, that Ursula enjoys (even though virtual reality spaces offer a sense of "social presence", atoms are preferred over code).

Ursula is an average teenage girl. She speaks and writes in two other languages in addition to her birth language. Besides her native German she speaks and writes in Chinese and English, the two major languages of global interaction and business. Ursula lives in a wireless world where she is connected to her family, friends, learning community, and information resources on a global scale. She, like other teenagers her age, holds a job, enjoys a social life, and is getting ready to leave home for the university or further professional studies. Ursula is considered to be from a middle class family (economic and social classes have been redefined in the mid-21st century), one who has benefited from the political-social advances from the year 2000. Ursula considers herself a citizen of the world as much as a citizen of German culture (all national borders have been eliminated by 2034). Again, this perspective is normal for most people across the globe.

Ursula arrives at her "learning center" (Schools are not called schools since 2011 in an effort to redefine what education "is" rather than what it was.), exchanges a number of greetings with friends, proceeds to a study center where she finds her favorite spot to work and think. Once there, sitting on the floor with a few big pillows, she turns on her tablet informing her of that day's schedule and study group assignments. The system then informs her of who else from her study team is online and displays any messages posted by her team since she last read them. Ursula notes that Marta from Poland, Alex from Mexico, and Barbara from Canada, all members of her study team, are in an interactive space for exchanging ideas and information (I use the historical names of countries even though national boundaries serve no purpose and do not exist in 2050, I wish to provide the reader a cultural and geographic reference points). There are seven members in the team representing different hemispheric regions (representing the regions and former countries of Germany, Poland, Canada, Chile, China, and Mexico). They have been working together as a learning community for almost two years.

The team has already started their daily chat and exchange of ideas. Ursula joins them while playing back their recorded discussions held before she was able to join the group (because of time zones not all students are able to start at the same time). After some short greetings and social updates (How was Marta's date last night and has Alex heard from the universities he applied to?) the team agrees on the topics and items they need to address in this meeting. The team is researching the effects of climate change as a result of a global shift of energy sources: from oil to hydrogen. Earlier the team researched the economic impact as a result of moving from oil to hydrogen as an energy resource.

Ursula is a member of two learning communities, this one whose focus is on the sciences, history and social politics, and mathematics. The other team has a focus on the creative and expressive arts. At times, the teams will merge to address issues and topics from a multi-disciplinary perspective. Both teams learn about each other's culture, religions, history, art, and world perspective, as well as their global identity (Even though national borders do not exist, historical identities are valued and maintained). Education at the learning center is multi-cultural, valuing every perspective as important and equal to the next. The advances in communication and information technologies since the 1990s have allowed learning to be global, while redefining terms like diversity, multiculturalism, and ways of knowing.

After her team meeting and a short break to stretch her legs, Ursula sits in on a video critique at the center. The students and faculty are discussing a new science fiction video produced in Egypt. The discussion includes students from Egypt and Italy (all via real-time video conferencing). Ursula is a contributor to a global multi-media high school newspaper. She is thinking about writing a critique of the film and to include video clips of today's discussion.

Later in the day, Ursula is meeting with her mentor, Antonio who lives in Gubbio, Italy. They will be discussing her current work and results from a knowledge survey of her factual knowledge in chemistry. Ursula and her advisor will use this information and discussion to identify her next inquiry into various aspects of chemistry. Ursula is considering investigating the development of oil based base paints/pigments used by the early Italian renaissance painters and its possible impact on ways the world was perceived by those who had access to them, as well as contemporary understandings of that period. After that they will look at her progress across various academic areas, as well as her interdisciplinary project engaging the crossing of a number of knowledge bases. Since there are no pre-

determined knowledge constructs (pre-determined objectives), progress is viewed as a learning process over acquiring fixed knowledge.

The rest of the day Ursula works on her collaborative research projects; continues her online tutorials on basic knowledge in science, mathematics, history, art, and literature. (Students at this point in time are expected to have base line knowledge constructs and skills for accessing knowledge databases) The curriculums for each of these areas emerge from a cross-cultural perspective. For example, Ursula not only studies the history of Europe in the seventeenth century, but also China, South and North America (including Central America), Africa, and Asia. The curriculum reflects a position valuing "knowing" from a broad cultural and geographic perspective. It is believed that not to know what conditions existed in western, eastern and central hemispheres in the seventeenth century would provide a limited understanding of social and technological development of today's thought and practice.

As can be imagined, Ursula's learning is defined differently; the role of teachers, and/or mentors/advisors is as well. Ursula has no time limits to her learning. Her biorhythms and the schedules set by her teams are all factors in her learning process. In this construct learning is not something that only happens between set hours and in a defined controlled environment. Through scheduled meetings and online portfolios Ursula's parents are kept informed of her learning (progress is not used because it refers to a set outcome, a fixed goal).

The two examples offered here point to a construct for thinking about the use of interactive online computer-based systems for creating learning environments. Each "story" positions the learner, the teacher, and the system in different ways, constructing the notion of schooling, learners, and teachers.

CONCLUSION

The development of online learning environments (this is radically different from online instructional environments), the history of schooling, information and communication systems, as well as the hopes, values and assumptions held by the different aspects of society concerning schooling, need to be considered in the development of virtual learning environments. As suggested in the second scenario, online learning provides the opportunity to shift and realign the power relationships between learners, teachers, and knowledge. Online learning environments offer an alternative to the historical understanding of schooling (as an institution and as a practice), teachers, students, and knowledge. Democratic education emerges from an

environment "designed" to be democratic and collaborative, giving voice and a place to all. Online education has the opportunity to shift the "center" to the "margins".

For "us" to consider the future of educational innovations through the creative and democratic process, we need to ask why it has not happened already.

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