

***Pedagogy of Dislocation:
An Educational Issue at the Dawn of the Third
Millennium***

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ABSTRACT

This descriptive research tries to probe the impact of the emerging information technologies on reshaping both face-to-face and distant education. At a time when the technologies underlying all forms of schooling are rapidly changing, the sketching of the emerging opportunities initiates a dialogue about the pedagogy of dislocation that will undoubtedly prevail in the impending Human Age. Interactive multimedia systems are said to hold the promise of revolutionizing education. In the future, it will be possible for people to learn anything, anytime, and anywhere. By using notebook-sized computers, pen-based interfaces, wireless networking, and relevant software, teachers can conduct field-based experiences in which students are physically distributed across an environment, yet linked together by shared data, and pedagogical guidance. Educators will be able to create "classrooms with electronic walls " that are useful in certain types of training, and that demonstrate the distributed learning approach. The cyber-school system, which adapts the approach of the pedagogy of dislocation, can prepare students to cope with the prevailing environment of the Age of Information.

The research, which forms an integral part of educational psychology, concludes that the different variants of current educational practices in schools and universities, including "credit for contact", "credit for computers ", and "credit for contact plus computers " should be reexamined to probe their effectiveness in the impending Human Age.

ملخص

التعليم بعيدا عن النمطية: قضية تربوية في مطلع الألفية الثالثة

تحاول الدراسة الوقوف على أثر التقدم في مجالات الاتصالات وتكنولوجيا المعلومات على الواقع التعليمي، وبخاصة فيما يتعلق بنظام المدرسة والتربية الافتراضية والتعلم عن بعد. فاستراتيجيات التعليم الافتراضية بمساعدة شبكات الانترنت، وهي ما يطلق عليه نظرية التعلم البنائي التفاعلي، تراعي الفروق الفردية وتجعل أعدادا كبيرة ممن يعيشون في بيئات متباينة كما لو كانوا أبناء طبقة اجتماعية واحدة يعيشون في مجتمع افتراضي متماثل. واستخدام استراتيجيات «الخبرات المستحصلة عمليا» سيحدث ثورة في مجال التربية، إذ سيكون بإمكان الفرد أن يتعلم أي شيء يريد في أي مكان يتواجد فيه وفي أي وقت يشاء. وينعكس كل ذلك إيجابا على فعالية التعليم واقتصادياته. وتقدم الدراسة تصورا لما يمكن أن تكون عليه المدارس والجامعات في مطلع الألفية الثالثة.

تأخذ الدراسة طابعا وصفيا، وتتبع منهجا استشرافيا في مجال علم النفس التربوي، إذ تدرس أثر استخدام التقنيات الحديثة على أنماط التعلم واستراتيجيات التعليم.

I. Introduction

Trying to express his vision of the role of the institutions of education at the dawn of the third millennium, Richard Riley - ex-Secretary of Education in U.S.A. - remarked that America would absolutely be unable to achieve very high standards of education if the students kept using lead pencils, and teachers continued using chalkboards and ditto sheets as teaching aids. He advocated using new information tools like the computer and new devices like the internet to create interactive citizens of the world that can reflect and express their views on supranational problems. And as the integration of telephony and data transmission infrastructure has become more prevalent, it is logical to plan for an educational climate where global telecommunications and interconnectivity dictate the utmost available for the structure of education institutions. Such institutions, once co-located for reasons of efficacy, tend now to be dislocated and geographically distributed over a wide area to

create a global presence, or to adapt to the needs of a more eclectic workforce.

In the past, three important actions had to be executed upon setting up any enterprise, either in business or in the field of services including educational ones: installing telephone service, establishing an account with the post office and a courier service, and advertising the presence of such an enterprise to the world. Such actions are presumably transformed in the "Information Age" to be as follows: installing an intranet for organizational communications, establishing an account with an internet provider, creating a World Wide Web site, and advertising its presence to the world. The most obvious implication in such transformation is that telephony is integrated with data communications. The most interesting byproducts of such integration are the access to video-teleconferencing technology and multimedia presentation technology. In the field of education, these changes could break what has been called the "credit for contact" model of instruction, but would at the same time require the introduction of a new system of "credit acceptance" alternative to the info-structures of education institutions. The different variants of current educational practices in schools and universities, including "credit for contact", "credit for computers", and "credit for contact plus computers", should be examined to probe their impact on the learning society in the impending Human Age.

II. Problem of the Study

Though oversimplified, this paper speculates about how the emerging information technologies may reshape both face-to-face and distant education. The major topics it tries to tackle are the following:

1 - Which is more plausible to adapt in order to create well-informed, technologically-sophisticated citizens capable of encountering the ever-changing requirements of everyday life in the current Information Age and the im-

pending Human Age: the traditional methods of instruction or the interactive multimedia and the tele-learning systems?

2 - What practices will education institutions adopt in the learning society that is expected to prevail at the dawn of the twenty first century?

3 - Will the creation of new learning opportunities through electronically supported materials and networking possibilities benefit the individuals to enhance life experiences, or will they just support the productive and consumeristic aims of corporate and global capital interests?

4 - Will the resulting dislocation of education have adverse effects on the learners?

III. Importance of the Study

At a time when the technologies underlying all forms of schooling are rapidly changing, the sketching of the emerging opportunities in the field of interactive multimedia systems initiates a dialogue about the cyber-school system which adapts the approach of the pedagogy of dislocation that will undoubtedly prevail in the impending Human Age. The "credit for contact" justifies the schooling system; the "credit for computers" system advocates deschooling society; and the "credit for contact plus computers" system calls for the adapts of the pedagogy of dislocation which seems inevitable at the dawn of the third millennium. Hence the importance of this study which takes the form of a qualitative research in the field of education psychology.

To my knowledge, this research is the first that highlights the importance of considering the pros and cons of adapting the pedagogy of dislocation in the learning society in Jordan.

IV. Rationale of the Study

Most of today's typical schools or universities are archaic: students and faculty still meet physically in real-time on a standard academic calendar at

the same site in classrooms. In a decade or so, and due to the integration of telephony and data communications, electronic wired universities and schools will likely be competing to tap the best minds around the world for ideas and knowledge that will be distributed to students. Excellent professors might just become international celebrities, sought after in a world that prizes understanding. Students would have access to the wealth of knowledge growing rapidly as the Information Age gains speed. Computers can be used to virtualize a few of a school or university's formal courses of instruction, allowing students to be taught by "virtualized" forms, instead of the traditional academic terms in the traditional classroom buildings.

It is for this reason that this research tries to probe the impact of virtual education and the anticipated strategy of pedagogy of dislocation on the learning society.

V. The Pedagogy of Dislocation as an Integral Part of Educational Psychology

In the computer industry, the term " virtual " refers to the techniques adapted to make computers operate as if they have more capacity than they actually have. The virtualized spaces of a cyber-school try to extend the capabilities of existing education institutions by creating complementary instructional activities that add new services to already existing institutions. In the future, it will be possible for people to learn anything, anytime, and anywhere. By using notebook-sized computers, pen-based interfaces, wireless networking, and relevant software, teachers will be able to conduct field-based experiences for students who are physically distributed across the globe, yet linked together with shared data, and pedagogical guidance. Educators will be able to create " classrooms with electronic walls " that are useful in certain types of training, and that demonstrate the distributed learning approach.

The main issue upon which video-conferencing rests is that human beings are visual creatures. Some assume that three quarters of the human knowledge is attained through the visual cortex of the human brain.

In fact, a medium shapes its users as well as its message. The book, for instance, develops people of effective imagination who can conjure a rich mental image from symbols on a printed page; the telephone creates conversationalists; the television induces passive observers; the information infrastructures, in like manner, will develop interactive people greatly affected by powerful interactive media capable of great good or bad.

The information technologies have a deep impact on the strategies of teaching as well as on learning styles. So the scope of the pedagogy of dislocation constitutes an integral part of the psychology of education.

VI. The Impending Human Age and The Learning Society

Historical ages are often defined by a major characteristic that typifies the most significant accomplishments of each age. Thus, we have the Stone Age, the Bronze Age, the Iron Age, and more recently the Electronics Age and the Information Age. Each of these ages has a specific natural resource or technical capacity that overshadowed all other aspects of that period. Even though the historic naming systems have frequently used either natural resources or technical factors to overshadow people, the evolution of human activities has portended the emergence of human beings as the dominant resource of a forthcoming period. It is as if human life has been germinating in preparation for its full flowering. It can be said that a Human Age will unfold when the human race focuses upon fulfilling its positive potential. Thus, the Human Age is the period when the earth's focus is upon the realization of humankind's potentials; i.e., loving, thinking and sound physical health. It seems remarkable that, as yet, human beings have not had their time history, a Human Age. This accelerating individualization of life-styles sometimes

goes to extremes of differentiation, making a cultural fragmentation usually associated with "late-modernity", by adapting ways not bound by traditional mores, modes and values to shape one's own life for oneself. It may be helpful to define the Human Age by contrasting it with previous ages. For instance, we can imagine a person of the Agrarian Age proclaiming, "Look how our plants are growing!" A person of the Industrial Age might brag, "Look at what our machines can do!" Someone in the Information Age could hold, "Look at the data our computers can produce!" In the Human Age an individual may say, "Look at how well people can live together!" Figure No. (1) clarifies the historical ages of human evolution and their duration (Spendier, 1974).

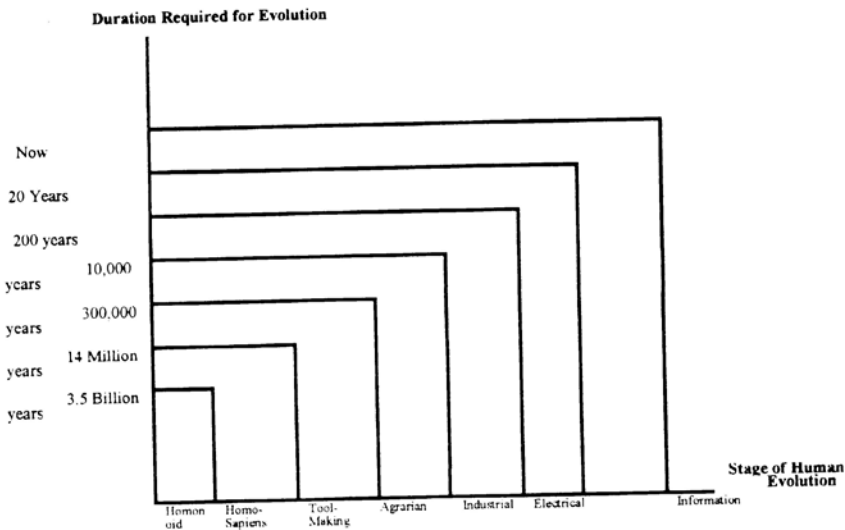


Figure 1
Critical Phases of Human Evolution

Historically, the following three main overlapping educational strands were discernible in the second half of the twentieth century (Strain,1997):

- 1 - The liberal modernist project to create equal opportunities in a social democracy.

2 - The subsequent redefinition of "opportunity" in terms of a learning market, stimulating extension of performative capabilities for individuals and the system in conditions where unregulated choice is allowed to define levels and forms of supply.

3 - The "Learning Society" which facilitates heterogeneity through learner participation in multiple, ephemeral and contingent networks.

The third model reflects the social conditions of globalization and associated qualitative changes in individual behavior in the "post-modern age", that is currently prevailing, and that will continue to do so in the first decade of the twenty-first century. The notion that we now live in an "Information Age" society is seen as dictating a relevant school system that is expected to depend upon cyber-schooling through intraneting, telecommunicating, and web-crawling. While this expectation would match teaching techniques to whatever alluring reflections the myths of an informational society are casting over the general public; it can also ironically, begin to embed education in the instabilities of global flexible specialization.

There are signs that the Human Age is already emerging. One major catalyst for this event is that the limits of machines are becoming more vivid. Scientists find that it seems impossible to give emotions to computers, and people still beat those electronic marvels on even the simplest tests of creativity. In short, while schools were previously asked to ensure the development of basic skills, they are now required to teach all students a new, broad range of cognitive skills demanded by the changing contexts in which students live. This new demand on schools is nothing less than a call for the democratization of thinking. Such a call brings sharp attention to those students placed most at risk to school success. Successful restructuring of learning that supports higher order learning for all students will require intense and persistent work, with particular emphasis given to the resources necessary to ensure that students placed at risk succeed as well.

VII. Electronic Education Made a Reality

Everybody is aware that computers are widely used for word processing and book keeping, for organizing information and making it available over communication networks. These applications are relatively recent. Electronic computers were originally invented in the 1940s for a single purpose, to perform numerical calculations. Computational applications are still tremendously important, but the marketing of digital technology would suffer greatly were it not for the other applications being promoted. Educational uses of computers are still relatively modest in comparison with traditional methods such as lecturing, laboratory work, recitations, debates, field trips, etc. But the situation is likely to change in the near future. According to some educators, "the major way of learning at all levels, and in almost all subject areas, will be through interactive use of computers"(Cooper et al, 1994). Just as technology has achieved productivity gains in business and manufacturing, we can expect technology to help with the "work" of education. So now, if a teacher can't respond individually to thirty students at the same time, maybe a computer lesson can -providing individual feedback to keep errors private. If the school can't afford a field trip to the museum, then a video or CD-ROM can bring images and presentations to the classroom. If students need access to information, they can search the Web. In spite of certain limitations - lack of intelligence or flexibility, limits in resolution, inequitable access, etc.- technology can help make theorists' progressive visions viable and affordable.

Interactive multimedia systems are said to hold the promise of revolutionizing education. In the future, it will be possible for people to learn anything, anytime, and anywhere. In a complex world of constant change, where knowledge becomes obsolete within a short period of time, education can no longer be something that one just acquires as a student to serve for an entire lifetime. Instead, education must focus on instilling the ability to continue

learning throughout life. Fortunately, the "information-technology revolution" is creating a new form of electronic, interactive education that should blossom into a lifelong learning system that allows almost anyone to learn almost anything from anywhere at anytime. The key technology in future education is something called "interactive multimedia", which is a powerful combination of earlier technologies that constitutes an extraordinary advance in the capability of machines to assist the educational process (Iuvara, 1994). By using notebook-sized computers, pen-based interfaces, wireless networking, and relevant software, teachers can conduct field-based experiences in which students are physically distributed across an environment, yet linked together by shared data, and pedagogical guidance. Walkie-talkies allow communication among groups separated by distance. Digital cameras enable collecting visual data for documentation. A cellular phone links the field-based team. All this empowers educators to create "classrooms with electronic walls " that are useful in certain types of training, and that demonstrate the distributed learning approach (Cooper et al., 1994).

Interactive multimedia combines computer hardware, software, and peripheral equipment to give a mixture of text, graphics, sound, animation, full-motion video, data, and other information. Although multimedia has been technically possible and in practice for many years now, it has become a major focus for educational development quite recently. Interactive multimedia systems can serve several purposes, but their great power is in highly sophisticated software that uses scientifically based educational methods to guide the student through a path of instruction individually tailored to suit the special needs of each student. As instruction progresses and intelligent systems are used, the system learns about the student's strengths and weaknesses and then uses this knowledge to make the learning experience fit the needs of that particular student. The following key advantages of interactive multimedia can be outlined (Lyman, 1993):

- 1 - Students receive training when and where they need it. An instructor does not have to be present, so students can select the time best suited to their personal schedules.
- 2 - Students can 'adjourn' training at any point in the lesson and return to it later.
- 3 - The training is very effective because it is based on the most-powerful principles of individualized learning. Students find the program interesting, so they stick with it. Retention of the material learned is excellent.
- 4 - The same videodisc equipment can be used to support a variety of training paths.
- 5 - Both the training and the testing are objectively and efficiently measured and tracked.
- 6 - Educational systems of this type make students engage in an interactive learning experience that mixes color movies, bold graphics, music, voice narration, and text. For instance, a program called "Columbus" allows students to relive the Christopher Columbus's voyages and explore the New World as it looked when he first saw it (Klipsch, 1995).

The ability to control the learning experience makes the student an 'active' rather than passive learner. Common systems include Sim City, Carmen Sandiego, and a variety of popular multimedia games created by a company called Broderbund Software - one of the biggest in this new field. Rather than the old "drill and kill" forms of computerized instruction that are known to bore students, this new form of "edutainment" is already known to be far more effective, because pupils get totally immersed in an exciting learning experience (Thomas, 1994).

VIII. Knowledge-Based Systems

According to some contemporary educators, the most effective method of learning is through interactive use of computers. In stark contrast with this

point of view, stand old-fashioned teachers who usually adapt the aural-oral approach as a medium for effective teaching, and reiterate the saying that the book is the university of the home. Hence, they vehemently oppose the introduction of new technologies in the realm of education, in just the same way that audio taping was resisted by the moguls of the music industry; video taping by Hollywood, and modems by the giants of telephone industry.

To make electronic education a reality, "knowledge-based systems" are essential. A knowledge-based system is a computer program that comprises a body of information and rules based on the experience of an expert that assists in understanding some field of study. Without knowledge-based systems, multimedia would be merely dumb, though colorful, presentations used strictly for entertainment. Knowledge-based systems are developing rapidly, and within ten years would presumably be commonly used in elementary and secondary schools as well as in universities (Tannenbaum, 1994).

Interactive videodisc technology is already used to teach history, geography, science, and other subjects. Knowledge-based systems could be linked with videodisc technology to enhance classroom instruction by tutoring students. For example, an expert system could be constructed to conduct simulated chemistry experiments via videodisc technology to demonstrate the analytical process. An intelligent tutoring system can actually even adjust its instruction to suit a student's level of understanding. Intelligent tutors are now used in teaching foreign languages, and other subjects (Means, 1995). Intelligent tutoring systems are predicted to become common in schools in the first decade of the twenty-first century as supplements to teachers' instruction. Students will be able to explore almost any topic through highly-detailed, fascinating collections of various intelligent multimedia computer programs, almost as if a scholarly tutor guided each student individually through the intricacies of the world (Means, 1995).

While schools, governments, and corporations are looking for better ways to educate people, multimedia instructional systems are becoming powerful, user-friendly, and cheap. So it is easy to imagine these systems finding wide use in learning situations that occur throughout life: such as teaching well-defined subjects; guiding technicians and mechanics through complex jobs; helping surgeons learn new operations; acting as automated sales-offices where customers can get information, occupying registration booths where students can conveniently register for classes, and performing countless other information-handling tasks. Although it is a bit beyond the scope of direct education, it should be noted that the Marriott Corporation has already installed such technology at eight universities in the United States of America to interest graduating students in joining the company; An interactive program informs the students about the firm, outlines various career opportunities and salaries, and answers questions they may have (Delaney, 1995).

Different variants of current educational practices in schools and universities, including "credit for contact", "credit for computers ", and "credit for contact plus computers " can be tested. In some instances, students come to computer-equipped lecture halls to see computer-generated graphics, outlines, or image displays, which supplement the lecture format in traditional large-enrollment classes. In other instances, students come to special computer-equipped classrooms to work in real-time and physical co-location with their instructors to perform computer-mediated math problems, music exercises, or composition assignments. In yet other instances, students go to classrooms to attend traditional small lecture courses in which instructors use lap-top or notebook PCs coupled with display hoods or overhead projectors to convey information from CD-ROMs, internet searches, or custom courseware packages. All of these innovations are exciting and important, but their ability to alter "the credit for contact" model is questionable. Typically, students and faculty still meet physically in real-time on a standard ac-

ademic calendar at the same site in one of the school's or university's classroom buildings. Networks and computers only extend and improve the display of information ordinarily mediated by the instructors' speaking voices, chalkboard diagrams, overhead projectors, slide presentations, or technical demonstrations. In each of such applications, however, personal computers and local networks are used in a certain mode that does not fully exploit the technical potential that public and private interests hope educational institutions can realize from instructional technologies. In other words, computers can be used to virtualize a few of a school's or university's formal courses of instruction, allowing students to be taught by "virtualized" forms, instead of the traditional academic terms in the traditional classroom buildings.

IX. Cyber-schooling and Virtualized Instruction

Computer-mediated communication systems, especially when enhanced to create a "Virtual Classroom", can make significant improvements in both access to and the quality of education. Rather than the physical space being built of stone and concrete, the virtual classroom consists of a set of group communication and work "spaces" and facilities that are virtual and constructed in software. The virtual type of classroom can successfully be used in a vast array of media mixes, as follows (Harasim, 1994):

- 1 - Face to face plus virtual classroom: This can vary from adding system use to enrich on-campus courses conducted by traditional means; to distance courses where system use is supplemented by one or two face-to-face meetings.
- 2 - Virtual Classroom as the sole means of delivery: This can be achieved with the use of print media in the form of textbooks and course notes.
- 3 - Multi-media: virtual classroom plus video, or virtual classroom plus audio or audio-graphic media.

University faculty as well as school teachers should not dismiss the prac-

tical implications of the new instructional technologies. These technologies can totally transform the existing discourses and practices of education; once they become more common, it would mean teaching on networks, instructing through computers, performing on CD-ROMs.

Virtual education institutions have several well-defined characteristics, among which the following can be mentioned: (Lazear, 1995)

4 - Independent of geography, with team members not necessarily collocated;

5 - Technology enabled, in that the members can meet and work together at any time via communications and collaborative technologies;

6 - More efficient than traditional organizations, because the energy normally devoted to travel is directed towards more productive pursuits;

7 - More cost effective, because it can operate with much lower overhead costs in the long run.

The key reasons for shifting to virtual instruction systems are advocated to be "cost control" and the "correspondence principle". On the one hand, the inhabitants of many societies rethink what they paid for collectively and how they benefit from it. Consequently, any large publicly financed program is under increased fiscal scrutiny. Traditional education services presume large systems with high personnel costs, major physical plant investments, and fixed curricular programming. Cyber-schooling has a clear promise in many decision-makers' imaginations as a means to reduce costs by moving educational activity into cyber-spatial info-structures, dumping access costs (computers and network time) to users, downsizing administrative and teaching staffs, eliminating many physical plant needs by constructing flexible info-structures, and keeping curricula more fluid. Cyber-schooling is believed by many to be highly cost effective inasmuch as it might reduce some of the many ways that educational funds have been spent by public authorities. The cyber-school system may prepare students to cope with the prevailing envi-

ronment of the Age of Information. But there will undoubtedly be a good deal of slack in the correspondence principle because the gap between what "the real world " really is and what the school or university actually can be, will probably remain as large as it is now. At the same time, cyber-schools may mimic the inequalities of Information Age societies as they train the elite who are informationally-competent. (Lucas, 1995).

Virtualized courses of instruction are becoming identified as the mythic pay-off for " instructional technologies ", because a virtualized school or university could address three important concerns identified as critical to larger publics : breaking the credit for contact paradigm of teaching, expanding the options for distance learning, and realizing new efficiencies in service delivery. If such transformation is taken seriously, then such a change will mean, in the final analysis, creating entirely new spaces and styles of instructional interaction that could perform the following (Robertson, 1992):

- 1 - reorder the entire mode of education with its existing systems for informing / testing / credentialing students;
- 2 - shift the basic understanding of scholarship / teaching /service for faculty;
- 3 - change the meaning of management / off-campus extension / instruction for administrators; and,
- 4 - cost a great deal of money / time/ energy on an order of magnitude not fully appreciated by all concerned.

Those new agendas for change, allegedly out there in society, cannot be addressed before considering some other very difficult questions about the organization and operation of cyber-schooling. Any school or university, which resolves to construct a cyber-school, needs to rethink what teaching and research become in light of these changes, as they build a standard operating environment, plan applying computer-based instruction on a large scale, and consider operating info-structures as an alternative delivery sys-

tem of instructional services. Virtualization of a few aspects of any university becomes a radical restructuring as far-reaching and challenging as any posed by the introduction of industrial era discourses and practices into education during the nineteenth century.

Cyber-schooling, as a student-centered / process-based / network-driven form of educating people, can be constructed such that it will be teacher-decentered /structure-debasing /network-destroying as these traditional elements inter-operate in many educational institutions at this time. How will such innovations be contained by existing associations of people, institutions, and technology?

The key educational issue for cyber-schooling will probably be showing how it actually valorizes formal instruction on its virtual campuses. Will it lower or raise the value of the education being provided? Cyber-school experiments should not be structured to reward professors for not teaching students. Unless and until cyber-school instruction enhances and enriches the education we now provide, it will be counterproductive to advance in these directions. Net-centric instruction systems rightly could be seen by faculty and students, on the one hand, as techniques for degrading and displacing academic labor as well as, on the other hand, maneuvers leading to the degradation of degree credentials and the displacement of academic status.

Cyber-schools need not provide a devalued product, but it is clear how virtual instruction can be designed to greatly increase faculty workloads, decrease student interactions, short change certain disciplines, overemphasize particular skills, scatter institutional resources, and reduce the value of academic services. In turn, many people - both inside and outside the education institutions - should see this set of outcomes as disastrous rather than as economical. Whether or not it is either the insidious plan by cost control conscious state authorities or the inevitable unfortunate outcome of misapplied correspondence principles, all proponents of cyber-schooling must guard

against a destructive downslide in all of their initiatives. Will cyber-schooling save money? In fact, these educational environments appear to cost much more money in as much as they are supplements to what now exists. While the traditional school and university only invested in buildings, faculty, and various supplies to teach students, they must continue to spend money in this fashion for their streams of "contact" instruction plus pay now to build and maintain info-structures. Local and wide area networks must be built, PCs should be purchased ideally on a one per student and one per faculty basis, support staff are needed to maintain these apparatuses, software and telecom connect time require constant outlays, and someone has to administer and plan all of this activity.

Cyber-schooling does not save money, although it can allow us to develop new learning communities, tap into now unserved student markets, and teach very differently by going on-line. Again, for non-contact institutions, the virtual campus may well provide an excellent introduction for some of its students to many of the "virtual offices" and "virtual factories" emerging out there in the world of work. In fact, all cyber-schoolers may even get some serious exposure to the new material inequalities of an informational order - slow operating systems, restricted memory, and inaccessible websites. Consequently, if cyber-schools are to be built, then they should be designed by their users as an open-ended experiment to change (but not increase) faculty workloads ; to enhance (but not decrease) student interactions; to equalize (but not short change) the resources, prestige, and value of all disciplines; to balance (and not overemphasize) the transmittal of certain discursive skills; to concentrate (and not scatter) the investment of institutional resources; to strengthen (and not reduce) the value of all academic services. New technologies, like those used in cyber-schooling, do not have only one or two structural/cultural possibilities locked up within them, awaiting their right use or wrong misuse. They have multiple potentials that are

structured by the existing social relations guiding their control and application. Any cyber-school's virtual spaces and classrooms can be constructed so that they will help actualize a truly valuable (and innovative) new type of education. Yet, this can happen only if some key initial decisions steer cyber-schooling down operational paths that are truly service-enhancing instead of plainly service-degrading.

Seeing this as disruptive, many faculty argue that the virtualization of instruction should not happen, and they pledge that such changes will not come to pass. Existing methods of "contact" teaching are the best, and only professionally acceptable, way to teach. So the only legitimate ways to teach, they advocate, are through "credit for contact" in real-time and physical co-location on the grounds of a built-environmental campus. This stance, however, is under fire. Because of the lobbying efforts of the professionals who wish to profit from and direct the virtualization process, and because of dwindling support for costly public goods, such as the existing systems of "outreach" and "contact" teaching in public schools and universities. These narrow points of faculty allegations are being thoroughly questioned by many state authorities and some members of the public.

The "virtual school or university" can be constructed, especially if one sees schools and universities only in terms of their in-class teaching. There are no serious technological barriers preventing them from developing. A virtual school or university ideally would open and close on demand in response to student users when those learners chose to access its various infrastructures at their discretion. And, there are reasons to believe, again mostly promoted by the information service industries, that cyber-schooling "fits" the cultural sensorium of today's students. Consequently, faculty members must begin considering the implications of their stubborn resistance, because these important choices about educational practices will presumably be made by competing agencies or even countries, and will perhaps produce less fa-

vorable outcomes for teachers and university faculty.

X. Distance Learning

Interactive multimedia and knowledge-based systems offer lots of opportunities to educate people long distances away through home schooling. A survey conducted by G. Cartright reveals that about one million American children were being educated at home late in 1994 compared with (49) million in public and private schools through the twelfth grade in the United States of America (Cartwright, 1994).

Personal computers, educational compact discs, on-line databases, and networks will make home-schooling even more effective in the future. The beneficiaries will include not simply those children whose parents choose year-round home schooling for them, but also those who are homebound due to illness or bad weather or political reasons and those with special learning needs that can not be met in their local school system. One can imagine that these technologies can also be used to supplement normal school education, somewhat like homework assignments.

Advances in telecommunications can also be used to supplement normal school education, such as homework assignments. These technologies are also facilitating distance learning for adults who want to broaden their education by tuning in to college degree programs. Adult distance learners typically receive college lectures by laptop computer and satellite or cable television. Interestingly, many universities are using distance learning quite effectively now, and the trend is reported to be growing dramatically. As more adults return to school, distance learning is evidently a valuable alternative that should help individuals pursue new career paths (Cartwright, 1994). These technologies also fit in nicely with the rapid emergence of collaborative learning and group problem solving. "Group-ware", which denotes the use of information networks to form various group decision sup-

port systems, is poised to explode because it offers a convenient, powerful new form of working together in modern organizations. A program called "Lotus Notes", for instance, is now being used by several million employees who work together at a distance on consensus building, brainstorming, technical tasks, writing reports, or any other type of teamwork (Delaney, 1995). As time advances, the growth of networking will facilitate the wide use of these methods for collaborative working relationships of any type around the world, forming a new type of organization that has been called the "virtual corporation".

Many people are afraid that electronic education will lack the "human touch" that is believed to be essential for true understanding. They are concerned with the assumption that there is no real substitute for the immediate dialogue that occurs in a classroom. Most of these concerns are normal, but unwarranted, fears regarding such a drastically different mode of instruction. Anyone who has participated in computer-conferencing or other interactive media reports that the intensity of relationships can be astounding. Even religious services are now commonly held over computer bulletin boards, and participants allegedly often find the experience more profoundly spiritual than services in a church or temple (Means, 1995).

As this technology improves, the "bandwidth" of clear, accurate, vivid information transmitted through electronic education should expand greatly to include almost all of the subtle visual and audible cues that we rely on for communication. And, of course, few people would want to use "tele-learning" alone for important matters such as understanding a difficult academic subject, so they will also seek out personal contacts to supplement electronic education. Teachers will always play an essential role, but that role obviously is indeed changing to focus on the more complex issues in learning that machines can not deal with. I infer that distance learning can be viewed as a vast increase in the range of instruction, permitting especially

gifted lecturers to reach an almost limitless number of students around the world, while other teachers give the students individual assistance.

XI. Conclusion : The Education Institution of the Future

In December 1996, the futurist Joseph Pelton remarked that traditional schools and universities were being replaced with cyber ones. If existing schools and universities do not reform quickly, they will decline into irrelevance. Paul Krugman has also commented that diminishing economic returns for academic credentials will lead to the devaluation of education, and a return to the academia's role in the nineteenth century as a primarily social institution for the children of the wealthy (Seaman, 1995). In the near future, ordinary PCs will be able to elucidate and show students the answer to a question in full-motion, talking, color video-graphics instead of simple written text. Personal digital assistants will become book-sized electronic companions for communicating, computing, and performing endless other tasks. Keyboards will be replaced with voice-recognition systems, and language translation will be computerized. Virtual reality will eventually allow one to enter any world imaginable. Screens won't be just the size of a desk, but an entire wall, so images will become life-size. Hardware will continue to shrink and to reduce the size of information technology such that powerful systems will be cheap and small enough to put in a pocket. Already, one can buy a briefcase that incorporates a computer, printer, fax, copier, and telephone, allowing immediate contact from anywhere.

If a society opts to accommodate this flood of information that is now beginning to pour forth, education institutions within it will be forced to become far more electronic than ever before. However, it seems that the emphasis will change: A primary focus for information technology over the last decade was automating functions in education. The focus for the next decade will apparently be on making strategic investments to improve academic pro-

ductivity (Delaney, 1995).

One of the major concerns of the 'wired school or university' is electronic publication of journals, because it speeds the distribution of knowledge and reduces costs. Publishers have been slow to use the concept because they are afraid that users would easily pirate copies of protected works using computer technology (Seaman, 1995). But these issues will be resolved as methods are improved to protect information and to automatically charge users for their access to an electronic publication. Journals are already being electronically transmitted to a limited extent, and this trend will continue. For example, Harvard University has embarked on an eight-year, twenty million dollar project to convert its books and journals to computerized storage (Seaman, 1995). Also, a publishing company is experimenting to make its journals available over computer networks. TULIP (The University Licensing Internet Program), by that same company is believed to be the first attempt to provide published, copyrighted materials over the Internet (Seaman, 1995). In the first decade of the third millenium, electronic scholarly journals are likely to be common, with hard copies being used for archival purposes only.

As these trends will probably reach a peak about the year 2010, education institutions may finally realize the enormous untapped potential of the information technology revolution. Today's typical school or university classroom is archaic: the only thing that distinguishes it from the classroom of the medieval school is an overhead projector. In a decade or so, electronic wired universities and schools will likely be competing to tap the best minds around the world for ideas and knowledge that will be distributed to students. And who knows? Excellent professors might just become international celebrities, sought after in a world that prizes understanding; While on the other hand, students would have access to the wealth of knowledge growing rapidly as the Information Age gains speed. So as I sit in front of my soon-

to-be-outdated Pentium PC to type this paper, I can not help but wonder just what the future does truly hold for education. I contemplate upon the measures adopted by the Ministry of Education in Jordan to prepare the teachers to cope with the rapidly developing technologies of education, and wonder if such measures are sufficient to face the inevitable advent of the pedagogy of dislocation.

Besides, it seems very likely that the inherent grandeur of electronic education will soon become a technical reality. This makes me look back in anger at the insistence of the Ministry of Higher Education in Jordan that all universities in Jordan should follow the prototype of the University of Jordan, without giving any space for creativity and getting rid of the traditional strategies of education at the dawn of the age of information technology and electronic education. As I stroll leisurely down the information superhighway, I can not help but wonder - aren't we already at least halfway there?

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