Journal of Maltese Education Research

Vol:3 No.2 2005 66-81
www.educ.um.edu.mt/jmer

A Postmodern Perspective on the Educational Attributes of Hypertext Environments

Patrick Camilleri

patrick.camilleri@um.edu.mt

Patrick Camilleri is an assistant lecturer at the Department of Physics at the Junior College. He also lectures on the use of Internet in Science and Education at the University of Malta. In 1991 he obtained a Bachelor in Education majoring in Physics and Chemistry from the University of Malta. In 2000 he received a Master in Science Education from the University of Sheffield. Presently he is reading for Doctor in Education at the University of Sheffield.

Research interests include developments in Hypertext Environments in general, Online communities, Identity Issues in Cyberspace, Internet Based learning and Science Education focusing on the design of m-learning and e-learning platforms to enhance learning and cognitive development.

Abstract:

The integrity and success of an implemented system is always directly dependent on the optimised relationship between input and output (Lyotard,1979). Hypertext environments and Internet in general offer a great educational potential only if they are fully appreciated by the policy makers and the end users themselves including teachers. The involvement of technology in education has always been characterised by systematic cycles of failures or incomplete successes. The nature of Internet and the World Wide Web are still shrouded in mystery and their validity and implementation still brings a sense of unease clearly related to the problem of alienation. Probably if Internet is readily available in schools for long enough to allow proper internalisation and naturalisation by all the participants then it could be appreciated and utilised more effectively.

Introduction

A brief history of technological failure in education: the root for doubt.

If the first economic paradigm was marked by agricultural dominion the extraction of raw materials and the accumulation of wealth and the second was governed by the manufacturing of durable goods, then the third revealed a shift of economic *postmodernization* or better *informatization* (Hardt et al., 2000, p.280). At the dawn of the 21st century the oceans of information that are engulfing us through various media and its transmission are changing our modes of living. (Boshier et al, 2000). *'It is clear that we are all drowning in a sea of information. The challenge is to learn to swim in that sea, rather than drown in.'* (Copernic Search and Discover, 2005). Today more than ever, knowledge is power.

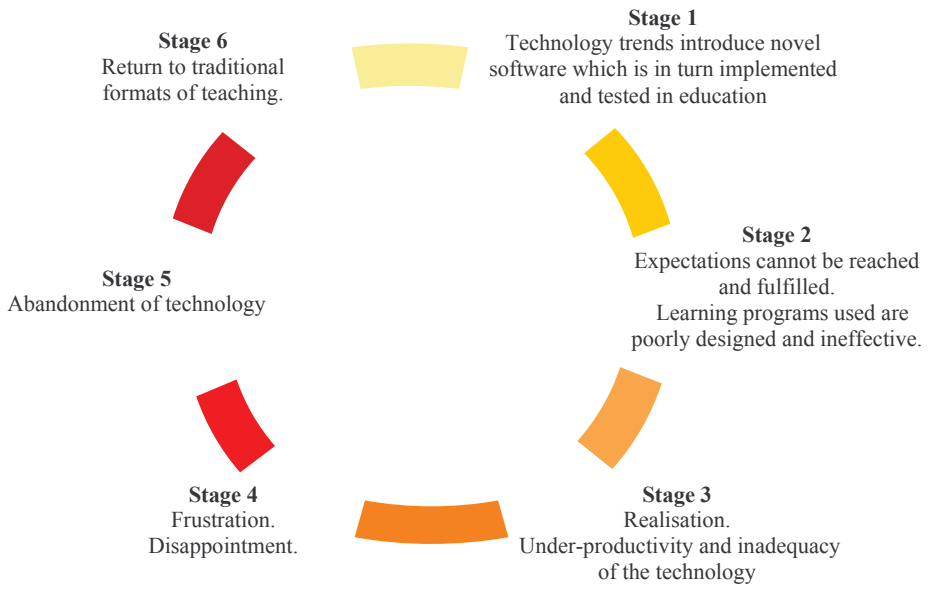
University of Malta, Msida, Malta MSD06
ISSN **1726-9725**

In a time where the unknown of yesterday becomes a fact of today, educators have to act fast. In a time when we are witnessing social transformations that extend beyond the corporate world, education is seen as a business and ideally a profit making enterprise. Education could be in crisis. Educational systems are facing an exploding student population, adult education, lifelong learning, high levels of specialisations, pressures from the industry and what is and what is not economically relevant and viable. The role of universities and tertiary education is being questioned, monetary resources are becoming overstretched and student to teacher ratio is becoming too ridiculously large to be effective. The reality of the classroom experienced by many undergraduates includes auditoriums with a thousand students, inexperienced teaching assistants and brief interviews with a preoccupied or impatient professor (Burbules et al., 2000, p.277). Unless significant changes are made, universities and colleges will find themselves in demise (Bates, 2000, p.9). If educational institutes are viewed as a financial burden by most governments, then it does not come as a surprise that educational reforms are being implemented in the process of striving to survive, bringing change, innovation and efficacy to the system.

The literature on educational change is full with theories and understandings of what has become known as the *change process* (Hargreaves, 1994, p.23) helping us appreciate the implementations of this change. However when the fascination of such goals will outshine the cause of their arousal then directions will be lost and the victims of such implementations will wonder about their purpose, and relevance to them (Ibid. 1994, p.23). In the light of these pressures teachers and educators look for solutions in various modes.

When Poster (1995) distinguishes between two eras in the setup and applications of ICT, he refers to the pre and post 1995 periods. The pre1995 typified as the *first media age* was characterised by the logic of broadcast (Lankshear et al., 2000, p.26). It was the first instance when the barriers imposed by time and geography on earlier communications formats were surpassed and asynchronous and real time communication capabilities became in vogue through wireless technology. It does not come as a surprise then that in the quest of finding alternative educational and pedagogical resources educators have allowed education to become entwined in the hype of innovative media commonly referred to as ICTs or e-learning tools.

The coming of new technologies can bring new hope but any eventual change does not always equalise in progress. There are those pioneers who on the leading edge can push the limits forward to develop inspiring visions or else build castles in the air (McCulloch, 1997, p.89, in Hargreaves, 2000, p.1). Every major innovation, be it the postal system, the telegraphy, telephony or any other major innovation in transmission and the processing of information is always greeted as the bringer of new order (John, 1994, p.101). The introduction, performance and validated output of technology in education is best described by a recurrent vicious de/evolution cycles of failures.



(Camilleri, 2003, p.3)

Robertson (2003) focuses on the failures of technological applications in education and refers to bygone trials as touring through a cemetery of neglected tombstones (Robertson, 2003, p327).

In the early 1920's Thomas Edison believed that motion picture would not only revolutionise educational systems but would supplant most if not all the use of textbooks. Well he was much better in inventing than predicting (Rosenberg, 2001, p.20). In 1932 Benjamin Darrow predicted that the radio may become the vibrant and challenging textbook of the air but again it did not happen (van Dam, 1999, pp.,4,5).

The audiovisual capabilities made television one of the first e-learning tools to be employed. Still besides culminating in a few extraordinary successes like Sesame Street it did not achieve the expected utopian learning environments because it not only caught educators off guard but left them in awe (Rosenberg, 2001, p.21).

Developments in computer technologies and changes in lifestyles made computers more prolific. The computer is a very versatile machine promoting various sophisticated learning strategies varying from a calculator to a processor of micro-worlds (Underwood et al, 1990, p.21) but in the hope of coping with the infinitely subtle variations and needs of the human psyche it evolved and grew out from the limitations prescribed by software to the continuum of cyberspace.

Educators should have learned a lot from the past and should have been quite familiar with the cycle of failures brought about by new technologies not be caught off guard again. Still the pressure to become web savvy and make a presence online caused educators to rush headlong in the acquisition and employment of the medium. In the process a plethora of flashy often pedagogically unsound classes, courses and even entire degrees flourished (Abbey, 2000, p.i.).

Hypertext environments[1] (including the Internet platform and the World Wide Web) have become the in-thing. *"The Internet marks the current high point …or the second age of mass communication"* (Lankshear et al., 2000, p.26). The stunning exponential growth of the medium makes it seem to have been with us forever (Blake et al, 2000, p.1). In a time when conventional libraries are being converted to digital libraries, with sizes comparable to if not even bigger than those of major libraries (Bruce, 2000, p.112), we have all experienced the expectations, excitement and maybe even insecurity if not fear in literally having access to such a body of knowledge in just a few mouse clicks. Internet has become fashionable and iconised in literature and Hollywood movies. The world has experienced an explosion of internet related jargon including terms like *global village*, *the matrix* and *virtual environments*, *cyber landscapes* and even *universities*. After reflecting on the great potential in its kaleidoscopic malleable nature, different disciplines strived to include and embody the magical 'e' in their reference giving rise to new systematic growths including e-meetings, e-business, e-commerce and finally e-learning.

Identifying Problems

The problem is that the startling novelty of the Internet currently occupies the foreground of our attention, rather than the diversity not only of the material available, but also of the possibilities for using it.
(Blake et al, 2000, p.3)

Now that the commercialised form of hypertext environments have been with us for almost a decade and the informational society is taking a more mature shape (Hargreaves, 2000, p.1), the agitation of novel excitement should be abating slowly, making it easier to evaluate problems from the outcomes of the current usability. When taking into consideration that initially it has been designed for a chosen few academics and for military use, educators tend to be quite sceptic by its pedagogical implications (Blake et al, 2000, p.2). Also, being burdened with an already crowded curriculum and with students who are not able to read their name, they are becoming frustrated, lack the enthusiasm and are wary in jumping into the *"ICT miracle, fix it all"* bandwagon (Henderson, 2002, p.4).

Political Scepticism

The nature of knowledge cannot survive unchanged within this context of general transformation. It can fit into the new channels, and become operational, only if learning is translated into quantities of information.

(Lyotard, 1979)

Blake et al (2000) present with a sense of admiration the diversity of communications capabilities and how they have changed the way we have come to perceive socialisation (Blake et al., 2000, p.144). In the same instance (with subtle undertones

[1] The term *'Hypertext Environments'* is used to include the Internet and the World Wide Web. The Internet is a networking protocol that enables remote computers to communicate with each other. On the other hand the World Wide Web, besides being quite a recent addition when compared to the Internet, is probably the colourful part of the medium that has made hypertext environments so popular and easily accessible to less technical people. It is a software protocol that runs on top of the Internet. Today the medium has evolved so much that at times it is difficult to make a clear distinction between the Internet and the World Wide Web. For instance while e-mailing activity is considered to be an Internet activity, the presence of web based utilities have blurred the divisive line.

of apprehension) they mention that the acquisition of information has been recognised to equate to power (Ibid. p.145, 2000). If the post-industrial or informational economy is characterised by flexible skills centrally governed by the important role played by knowledge, information and communication (Hardt et al., 2000, p.285) then personal symptomatic anxieties could arise as the individual questions his/her position and tries to keep in touch with reality (Blake et al., 2000, p.144). Transitional processes from pre to post-industrial situations and cultural postmodernist metamorphoses are always accompanied by disjointed times for the societies involved (Lyotard, 1979, p.3). Sullivan strives to reveal the moral and spiritual atrophies resulting from current and dominant developmental models by labelling present time as THE "*terminal cenozoic"* (Sullivan 1999, p.104) which not only marks *"the end* (or demise) *of an incredible period in the history of the earth"* (Ibid. p.104) but is bringing with it a radical change in modern educational thoughts synonymous to the lulling intonations of a new religion referred to as 'modern progress' characterised by 'growth, development, globalisation, competition and consumption' (Ibid. p105).

The diffusion of online education and the Internet are tightly intertwined with the dynamics of globalisation (Blake et al., 2000, p 12.). According to the World Bank, globalisation is characterised by complex and integrated economies and societies all over the world (The World Bank Group, 2001). This has been enhanced further not only by cheaper transportation but also by lower communication costs aiding a greater international and intercultural flow of ideas and capital between high and low income countries (Anon., 2004, p.5). This highly utopian vision or political imagery, of massification and flexibility in the dissemination of knowledge may not be that credible to everyone. Philosophers of education are not against the educational value of hypertext environments but they should critically see and assess its validity and remain with their feet on the ground without fantasising futuristic overviews of the medium.

Doubts about the validity regarding Internet arise when considering its roots. Internet may be considered as the fruit of academic milestones, but it has not always been that way. The Internet origins date back to a project sponsored by the US Defence Advanced Research Agency (DARPA) in the provision of a network between the military and academics in sharing information (Sherman et al, 2001, p.1). It's major role was to transfer information through multiple routes in a process referred to as packet switching allowing information to be split and routed through various channels in a network to be reconstituted at the target (Bagnall, 1998, p.143), enhancing security and at the same time allowing information to reach the target even if one or more routes would have been jeopardised. Therefore it would not be surprising if educators might be sceptic and worried about educational validity of the medium due to its entanglement with the military and as being observed even with the world of business (Blake et al, 2000, p.2).

In fact the first node that was installed on the ARPANET was set in UCLA in 1969 to be utilised by universities and defence and military contractors alike (Sherman et al, 2001, p.2)

Sceptism lies in its actual implications that go far beyond the immediate tangible sensory qualities of the medium. Probably what caused hypertext environments to become so prolific were not mainly its audiovisual attributes but as Poster (1995)

targets well, the ambitious removal of any "*logical boundaries between the producers, distributors and the consumers*," in coming of the second age of mass communications (Lankshear et al, 2000, p.29). What made hypertext so popular was not the Internet platform but the software interface on top, the World Wide Web. The WWW offered unlimited possibilities in hands-on communication, taking it a step further to interactive electronic socialisation. Internet has actually broken the television's monopoly (Anon, 2004, p.7). The computer and eventually the Internet involve the user in interactive communication (Standish, 2000, p.156). TV is an incidental medium (Ibid. p.156). What is viewed on TV is not controlled by the user while channel hopping leads to unrelated programs and images, on the other hand links in websites exist when a connection has been identified. On the Internet people can choose what to see and how to interact. Therefore it was the people who made the net the way it is and not the technology. The Internet has become the prime venue for social interaction and people prefer to be without TV but not without the net (D'Amico, 1998). Americans say that the Internet has made their lives better and in a poll implemented by Gallup, a majority of American citizens preferred the Internet to the television (Moore, 2000).

Ironically this might be quite misleading. In spite of the Internet's growing influence it is still viewed by many social observers as either a technical curiosity or else as a business potential (Lebo, 2004, p.97) and its implementation in education is always characterised with a bitter aftertaste of incomplete success and integration. While information technologies have had a great impact on society and work places at large, the implementation of current technologies in America's elementary schools had been only limited (President's Committee, 1997, PARA 10.1, p.92). Roberston (2003) puts it more bluntly by stating that*"...with perfect clarity. After twenty years of effort and funding the computers in the classroom project was an unambiguous failure."* (Robertson, 2003, p.323).

On similar grounds as reported in the year 2005 by school inspectors in Scotland:
…from the general inspection programme shows that some schools have already made decisive progress in using ICT effectively in learning and teaching. However, the evidence also provides a salutary reminder that effective practice is not yet sufficiently widespread or consistent in quality across Scotland.
(NGFL, 2005).

In Malta, by the year 2000 Internet should have been introduced in all schools with the gradual networking and connection to the Internet, still significant investment is required to promote similar projects (National Development Plan, 2003-2006). To date Internet is unavailable in most state school classrooms and in the largest and state governed post secondary institute it availability to students and academic staff is practically unavailable except for a handful computers in the proctor's room. Thus it does not come as a surprise if the educational validity of the medium remains uncertain if not grossly mistaken as irrelevant.

The true goal of the system, the reason it programs itself like a computer, is the optimization of the global relationship between input and output-in other words, performativity.

(Lyotard, 1979, p.11).

In the last seventy five years or so the achievements in science and technology has actually outperformed anything that man has done in the last two thousand years, yet with all our technical feats there is one field which although is highly relevant to a great number of people for a prolonged period of time in their life hopelessly lags behind and stubbornly resists change and that is education. (Scheidlinger, 1999, p.119)

I've believed that education is the killer app since 1962, when I taught my first computer course to high school.

(van Dam, 1999, p.3).

And

Except for the real successes-the only two technologies to universally succeed-books (are) chalkboards, now whiteboards.

(Ibid. p.7).

There could be various reasons why ICT are not that successful in schools. Probably a major one its unavailability. Putting that aside (not for its lack of relevancy) there could be other less obvious traits which slows their actual implementations. One possible trait could go beyond sceptism and it is doubt or even more, insecurity towards the implementation of ICT.

There exists a gulf between the acquisition of knowledge and its actual conceivability, in the internalising process of conceptualisation and eventual understanding of novel principles. Its intrinsic values should go beyond the basic motor skills required to access and manipulate the medium. The demand to train the teachers to use Internet effectively in teaching always leads to the dilemma and often neglected question, …*"to do what?"* (McCrory Wallace , 2004, p.482).

For instance there could be the fear of deskilling as notioned by Blake et al., (2000) when quoting Iain Arnison, a lecturer in multimedia. Arnison (2000) sets intriguing questions of why do we have to learn arithmetic when we have calculators or why do we learn to read text when it can be dictated by computers? (Bowers, 2000). When talking about the revolution that is being brought about by the technological change and Internet on the "*long standing narratives of foundation and legitimation"* of knowledge Lankshear et al mention upheaval and massive assault. (Lankshear et al., 2000, p.18). Lyotard (1997) with a hint of Orwell's epic story 1984 refers to a continuum of limitless knowledge where *"the Urbs becomes the Orbs"* (Lyotard, 1997 in Blake et al. 2000, p.147) in a nightmare or dystopic vision dominated by a totalitarian technological state in our desires for freedom (Ibid., 2000, p.147). Simply stated there is a sense of hostility by those who fear that Internet would not only depersonalise learning but would reduce knowledge to information (Standish, 2000, p.153).

But does it have to be fetish to be effective? Do we need to describe Internet and technology in a horribly magnificent manner in order to try to make sense of it's existence?

The fetishism of commodities arises out of the fact that a social relation between producers assumes a fantastic form.

(Standish, 2000, p. 159).

Feeberg (1999) suggests that:
The same kind of ignorance that bound men to the gold standard for centuries maintains the illusion that technology is an alien force intruding….from a coldly rational beyond.

(Feeberg, 1999, in Standish 2000, p.158).

Writing about new technologies always involved the idea of a pure system, unyielding to social norms, changing the future and stamping everything out behind it (Thrift, 1996, p.1469). There is also a certain sense of universal exaggerated ubiquity in their description especially in the case of the Internet like: the new space, (and interestingly always a space), post-modern hyperspace, cyberspace, the netscape, the information superhighway (Ibid., 1996, p.1465), an impressive information harvest (McKenzie, 1998, p.26) and interestingly enough (due to its pornographic content) was also interpreted as a heavily used red light district (Griffiths, 1996/7, p.31).

Probably it is a misconception if hypertexts environments are promoted as the new messiahs for our educational systems. Like wise it does not make sense to mystify their use due to lack of understanding of its chameleon characteristics (Lankshear et al, 2000, p.23). The information revolution has not unfolded in a vacuum (Anon., 2004, p.5) but is best seen as an extra link in our predisposed arsenal in the accurate dissemination of knowledge. Then there are those who oppositely consider that hypertext environments are a mere add-on to what was already present. Thagard (1997) considers the Internet as an essential part for scientific communication (Thagard, 1997, p.3) and, contemporary communications that involve huge teams of scientists (Ibid., 1997, p.5). He provides the impression that they are more than a mere add-on, in fact *"the World Wide Web has been an immense boon"* (Ibid., 1997, p.7), especially in the forefront of research where novel discoveries would make text in books instantly obsolete (Ibid., 1997, p.7).

The perceptions on the medium offered by Thagard are highly valid but disturbingly discriminating as if the medium has been set to be employed by a chosen few. Weston (1994) argues that this might have been the initial ideal of the creation of the net which to date has developed quiet differently, defying centralisation and as described before as a medium for the people and made by relations and by the people (Lankshear et al., 2000, p. 20). His view may not be far fetched though from a parallelism that may be attributed to another basic underlying feature of the medium, language.

Travel, international conferences and faculty exchanges have all aided in the development of a network of common interests with the privileged universal language of publication being English (Burbules, 2000, p.281), becoming even more so with Internet which is not only the globalising medium but also a vector for the diffusion the cultural monopoly of its creators which is the language. English speaking net users find no problem for a very important reason that when interfaces for the medium were set they were designed to accommodate English words. It does not come as surprise then if in the year 2000, of approximately two hundred million Internet users, more than half came from English speaking countries including Canada and the USA (Bruce, 2000, p.109) while today out of more than six billion user on the net, English

is still the most diffused language making up more than thirty percent (32.8%) of the top ten languages used online (Internet World Stats, 2005). In a process that Blake and Standish (2000) refer to as '*Imperialism'* (Blake et al, 2000, p.14) or the fostering of an invading culture through the implications of the interface design, it would be easier for the user to reconcile for the language than be faced with a probable heavier cognitive load brought about by a new interface setup. Therefore it would inexorably become an accepted fact for internet users who, coming across diverse cultural backgrounds would allow them to take up and drop recognised characteristics of these cultures (Wild, 1999, p.195).

Epistemological Doubts

Probably epistemological and political issues cannot be utterly separated from each other. Policies arise from paradigm shifts that validate the ontology of an ideal in preference of another which in their case give rise to epistemological issues, related queries and debates. It is not of immediate relevancy to ponder upon the notion if hypertext environments are here to stay or are just temporal before being designated to the perpetual cycle of failures like other preceding technological applications. It would be imperative if while still in vogue they would be properly 'polished' for their potential pedagogical qualities not through the validation of their existence but for their educational viability, implementation and use. It would be important to see how hypertext environments would contribute to the building of knowledge, and the way education would change now that it seems that the Internet is making such a long permanence.

Probably one of the great mistakes is on trying to duplicate traditional learning environments in hypertext and vice versa. In the early years of employing Internet in education, material was systematically being copied and transferred from paper to the electronic medium. Educational computing and its variants collectively referred to as ICT have emerged so rapidly that there has not been enough time for a robust intellectual tradition to be established (Dillon, 2004, p.138). Considering the present format of the Web it would be ill advised to rush online and not expect the backlash of disillusionment as it would not achieve expectations (Jones et al., 2000, p.130).

There are conservative educators who take advantage of this situation, grasp the consequences of this view and consider if not conclude that beyond the glamour brought about by electronic devices (Blake et al, 2001, p.6) the Internet and the World Wide Web in essence (in terms of educational qualities) do not offer anything more than what was already present. The fact remains that developments in paper/printing technologies with consequent face to face discussion still dominate public education and the audio-visual media has been treated as an icing on the cake (O'Hagan, 1998).

Another important aspect is the credibility of information found on the net especially when considered in the light of its structural characteristics.

> The essential property of the WWW is its universality…anything can link to anything. (it) does not discriminate between scribbled draft and polished performance…Information varies along many axes.
> (Berners Lee et al, 2001, p.31).

Conceptually, hypertext environments represent the direct opposite of traditional learning environments that employ a book-like attitude of a linear strategy that takes the reader through a set of measured controlled steps from objectives to goals. In the World Wide Web there is also a sense of fragmentation. Marchionini (1988) mentioned the term '*hyperchaos*' to refer to the amount of unstructured information found in hypertext environments that might cause the user to experience a sense of bewilderment and loss (Berry, 2000, p.50). Every time that a page is opened on screen the user is flooded with a multitude of information that necessitates an extra mental effort to distinguish and assess between content and presentation of literature offered by a link in preference to another. There is also the problem quality of information. The problem of hypertext environments may be synonymous to man's futile efforts to randomly juggle with symbols and letters to recreate the inaccessible and infinite number of library books in the 'The Library of Babel' (Borges 1989). Between them they could make every possible combination of letters, space, commas and the full stop providing information about anything. Unfortunately this is similar to the Internet. Hundreds of millions of pages hold the promise of finding what we want but the sheer volume of material gets on in its way (Bruce, 2000, p 110). With the virtue of a progressively larger amount of material readily available, Internet seems to be heading to a cognitive overload (Dickinson, 2000, p.200), (Berry, 2000, p.50) making it easier for the user to download chunks of information than trying to differentiate and sift through it. This type disorienting political freedom, lack of judgement and commercialisation offered by hypertext environments can cause educational thinkers to express a certain element of scepticism on the possible outcome of this uncontrolled mode of learning acquisition. All books that are officially used by educational institutes carry a seal of approval regarding content and pedagogy (Abbey, 2000, p.i). What about online literature? There is no recognised authority or editorial board that can invite or vet for any material that is placed online, making any material (unless coming from a known reputable source) disputable (Bruce, 2000, p.110). A web page can look like any other, the credibility of a page may not be apparent to the viewer to such an extent that it may develop a misleading reputation and accreditation (Burbules et al, p.281, 2000). The web today hides its treasures behind a lot of "*semiprecious and junk-grade texts"* (Bruce, 2000, p.112). Consequently one must rely on other indicators like the provenance or source being tapped (Lankshear et al., 2000, p.31). Still there would be the argument that even though hypertext environments spell liberalism and globalisation policies, links chosen and pursued would always have been subjectively made in preference over others by their publishers and creators.

The radicals present and focus on the other side of the same coin. What may be referred as hyperchaos for some is interpreted as 'neutral theory' to others. If six of the standard 2x4 LEGO blocks can be combined in 102,981,500 ways (Wiley, 2004, p.17) then the larger the number of links offered per search in the WWW, the larger would be the number of learning outcomes. They, rather sublimely, interpret the various implications of the medium, its synchronous and asynchronous capabilities and the sensory qualities as a form of uniqueness that would inevitably have a great impact on traditional learning as knowledge is transferred to the net. Established and seemingly impregnable learning paradigms underwritten by ideals of progress, personal and collective enhancement that the student would have to follow have been altered. Oppositely to what conservatives claim, written materials and books have lost their absolute nature as the sole or even leading mode for the dissemination of

knowledge. Since the commercialisation of new technologies is becoming one of the major drivers of society it is natural that such influences are spilling into the field of education. Educational and teaching environments have always been characterised by a certain degree of status quo strengthened both by the secluded security of the classroom and the modus operandi of day to day activities. To be sure, the fact that teacher student interactions have remained unchangeable for centuries then it is enough evidence to prove that there must be something educationally essential about them (Burbules et al., 2000, p.279). In the past the teacher's schemes of work, lesson plans and activities due to the physical classroom limitations, were always linear and synchronous (Dickinson et al, 2001, p.195). The classroom is still there and even though physically it may have not changed a lot, both the expectations and aptitudes of its occupants have evolved. The diffusion of the home computer and broadband internet have brought the library into our homes. It would not be uncommon to have students who precede their teachers in the sequence of the set learning process. The student is considered to have become autonomous in the activity of learning (Lankshear et al 2000, p.17). Today's students are the members of the digital generation. They were brought up in the midst of robust technological media including home computers, video games, cyberspace, networks and virtual reality where interaction is a must (Duderstadt in Katz, 2001, p.7). Therefore they expect and approach learning in an interactive plug and play manner which is not as sequential as educators may be accustomed to (ibid, 2001, p.7) and that is what hypertext environments by nature are offering. This is leading to the consideration that learning can be self sufficient thus inspiring interest to see what is involved in becoming an authority or expert in an area of knowledge (Lankshear et al, 2000, p. 17).

Conclusions

…and the teacher… doesn't it takes two to tango?

As the end of the century approaches…constructivist theory and Internet technology are converging on higher education. They appear to be highly compatible….However, these materials are not directly suitable for integration into a taught course.

(Tait, 1998, p.3).

In hypertext environments the prevalent pedagogical paradigm has been constructivism principally focusing on the active role of the student's activities in the centre of the learning process and the design of the proper interface to enhance such activities. But what about the other major game player, the teacher? In this specific approach the teacher's role has always been that of a background supporter lately conceived as that of a mentoring steersman expertly guiding the students through the learning process, but there could be a missing paradigm.

Research has focused on enhancing technologies and ICT for student learning but has been rather slow on researching how to integrate and use this technology in classrooms and less is known on how it varies across diverse disciplines (McCrory, 2004, p.449). The main idea behind ICT has been the introduction of computers in educational institutes at teacher and student levels with very little attention being given to the any underlying philosophical foundations so much so that ICT has had applied to it theoretical foundations developed elsewhere in education (Dillon, 2004, p.2). Teacher knowledge and beliefs, teacher preparation and professional

development all contribute to understanding what they can do when they carry out activities with the Internet. Teacher preparation for teaching with technology should foresee the acquisition and familiarity, which go beyond its startling novelty and concentrate more on its pedagogical viability. A common trend that Shi et al. (2004) note is that typically teachers consider ICT as an addition (Shi et al, 2004, p.44), primarily focusing on the content of the core subject that leads to workable solutions rather than the importance of technology on the learning process (Goldman, 1999, p.2). The benefits of the blend between content and applications of ICT would be maximised once readily available technological applications would become naturalised through a lengthy weathering process that might take years to meld into the background of the learning activity and to be promoted as a necessary necessity (Ibid., 1999, p.2).

Dickinson et al (2000) present an androgogical view and hint in implementing the adult open and liberal style to lower grades students (Dickinson et al, 2000, p196). While pedagogy is akin to training, convergent thinking and rote learning, androgogy is more learner oriented as it is about educational freedom and the thrill brought about by uncertainty of the outcome. It emphasises learning through experience and opens up new vistas. After all is that not what hypertext environments are all about? This is best achieved if the learner is allowed to steer through the learning process but offered proper support by a well equipped teacher.

In order to take advantage of the Web, educators must be prepared and prepared properly (Jones et al., 2000, p.130). Preparedness implies that educators must be able to foresee the integration of ICT in a holistic pedagogic front which should place an emphasis on teacher training programs. Only if the user would become acquainted and understand the mechanisms of the medium would make him or her more fluent in its use thus able to reflect and uncover its potential inference. Questions which would arise in this case would include the validation of the term computer literacy and Internet literacy. The computer, just because it has a keyboard, does not make it a glorified typewriter (Blake et al., 2000, p.7). If the creation of a computer literate society is a recommendation or a demand from the political stance of lifelong learning one has to see how it can possibly adapt to rapidly changing technological demands and lifestyles (Viteli, 2000, p.2). In the SECI (Socialisation, Externalisation, Combination, and Internalisation) model Nonaka (1998) considers that the creation of new knowledge is a process of interactions between explicit and tacit knowledge. Unless there is a bridging between the actual literacy and the conceptualisation of the true benefits of the medium then resources and the real potential of the medium will be lost (Blake et al., 2000, p.9). The learning process is optimised only if the learner feels no external threats brought about by the natural use of the learning tools in the learning environment the same way as the ball pen calculator and pencil are used. Wiley critiques the lack of theory in instructional design and stresses the purposeful conceptualisation and use of learning objects that include multimedia content, learning objectives and instructional software and software tools to support learning as the basic information objects for higher instructional order (Wiley, 2004, p.18). From personal experiences in the mastering of software and its actual use Sellinger (2001) states that there is a strong body of evidence suggesting that students would become competent users of technology and ICT only if they are conversant with the basic applications (Sellinger, 2001, p.143).

It is reasonable to suppose that the proliferation of information-processing machines is having, and will continue to have, as much of an effect on the circulation of learning as did advancements in human circulation (transportation systems) and later, in the circulation of sounds and visual images (the media).

(Lyotard, 1979, p.4).

Without being overtly optimistic it can almost be assured that the Internet is here to stay especially when its applicability is inexorably seeping into a multitude of human activities and what may have been once a luxury to a chosen few military or academic intelligentsia is becoming a basic social necessity for most. I think it would not be too wrong to consider that hypertext environments are here to stay, the way TV and radio have remained. It would evolve with time the way TV has evolved. We are already observing traits and strengths of hypertext environments being plugged in the medium and are quite familiar with terms like interactive TV. Taking it directly from the creator of the World Wide Web, we may eventually experience the next evolutionary stage of the medium referred to as The Semantic Web (Berners-Lee et al, 2001 pp.29-37) which is a new form of web content that is more meaningful to computers and humans alike. Probably unleashing new potentials especially with the onset of novel break-through in self aware artificial intelligence, it would still be an another important extension of what we have today (Ibid., 2001, p. 31) It would be something to ponder on and philosophise about awaiting what's next in the technological 'Pandora's box'!

References

Abbey, B., (Ed.) (2000). *Instructional and Cognitive Impacts of Web Based Education.* Idea Group Publishing, Hersley USA.

Anonymous, (2004). *Globalisation and Changes in the World Order.* Headline Series; Spring 2004; 325. ProQuest Educational Journals.

Bagnall, P., (1998). *The Internet: where it came from, how it works.* Physics Education and the Internet. 33 (3). (Institute of Physics and IOP Publishing Limited).

Bates, A.W., (2000). *Managing Technological Change. Strategies for College and University Leaders.* Jossey Bass Publishers. San Francisco.

Berners-Lee, T., Hendler, J., Lassila, O., (2001). *The Semantic Web.* Scientific American. Madison Avenue New York.

Blake, N., Standish, P., (Eds.) (2000). *Enquiries at the Interface: Philosophical Problems of Online Education.* (Blackwell Publishers Oxford UK)

Blake, N., Smeyers, P., Smith, R., Standish, P. (2000) *Education in an Age of Nihilism.* (Routledge Falmer, UK).

Borges, J.L. (1989). *"The Library of Babel"* in 'Labyrinths.' (Penguin Books LTD, 2000)

Boshier, R., Onn, C., M. (2000). *Discursive Constructions of Web Learning and Education.* Journal of Distance Education/Revue de l'enseignement 'a distance (2000) Canada.

http://www.cade-aced.ca/en_pub.php (Accessed April 2005).

Bowers, S., (2000). *Modern Visions and the old school of thought.* The Guardian Tuesday February 29, 2000. http://education.guardian.co.uk/higher/story/0,,141511,00.html (Accessed April 2005.).

Bruce, B.C., (2000). *Credibility of The Web: Why We Need Dialectical Reading.* In : Blake, N., and Standish, P., (Eds). (2000) "Enquiries at the Interface: Philosophical Problems of Online Education." (Blackwell Publishers Oxford, UK).

Burbules, N.C., Callister, T.A., (2000). *Universities in Transition: The Promise and Challenge of New Technologies.* Teachers College Record, Vol. 120, No.2, pp. 273-295. http://faculty.ed.uiuc.edu/burbules/papers/highed.html (Accessed April 2005).

Camilleri, P., (2003). *Evaluating E-learning by identification of relevant issues in Instructional Web Based Environments.* The ATEE 28th Annual Conference, University of Malta.

Copernic Search and Discover. (2005). About Copernic-Profile http://www.copernic.com/en/company/profile.html (Accessed April 2005).

D'Amico, M.L., (1998). "Internet has become a necessity, U.S. poll shows." http://www.cnn.com/TECH/computing/9812/07/neednet.idg/ (Accessed February 2005).

Dickinson, D., Stewart, V. (2001) *Towards an androgogy for living in an information society,* in Stephenson J (Ed) Teaching and Learning Online. "Pedagogies for New Technologies." (Kogan Page LTD UK).

Dillon, P., (2004). *Trajectories and Tensions in the Theory of Information and Communication Technology in Education.* British Journal of Educational Studies, Volume 52, No.2, June 2004, pp. 138-150. (Blackwell Publishing Ltd. UK).

Duderstadt, J.J., (2001). *Can Colleges and Universities Survive in the Information Age?* in Katz, R.N (ed.) (2001). "Dancing with the Devil". (Jossey-Bass Inc, Publishers California).

Goldman, S., Cole, K., Syer, C., (1999). The Secretary's Conference on Educational Technology-1999. The Technology/Content Dilemma. US Department of Education. http://www.ed.gov/rschstat/eval/tech/techconf99/whitepapers/paper4.html (Accessed March 2005).

Griffiths, M., (1996). *Children and the Internet.* Media Education Journal, pp.31-33, Winter 1996/97. (Media Matters UK).

Hardt, M., Negri, A. (2000). *Empire*. Harvard University Press. (Cambridge, UK).

Hargreaves, A., (1994). *Changing Teachers, Changing Times. Teachers' work and culture in the postmodern age.* (Redwood Books, UK).

Hargreaves, A., (2000). *Editor in Chief's Introduction Representing Educational Change.* Journal of Educational Change 1: 1-3, 2000. (Kluwer Academic Publishers. The Netherlands).

Henderson, S., (2002). Ministry of Education. *Digital Horizons; Learning Through ICT.* Ministry of Education, Wellington, New Zealand. (Crown New Zealand)

Internet World Stats (2005). Internet users by Language. Top 10 Languages Used in Internet. http://www.internetworldsats.com/stats7.htm (Accessed March 2005).

John, R.R (1994) American Historians and the concept of the communications revolution in: Thrift, N., (1996). *New Urban Eras and Old Technological Fears: Reconfiguring the Goodwill of Electronic Things.* Urban Studies, Vol. 33, No. 8, pp: 1463-1493. (Carfax Publishing, UK)

Jones, G.M., Lowther, D.L., Plants, R., T., (2000) *Preparing Tomorrow's Teachers to Use Web-Based Education.* In: Abbey, B., (Ed) (2000). "Instructional and Cognitive Impacts of Web-Based Education." (Idea Group Publishing UK).

Lankshear, C., Peters, M., Knobel, M. (2000). *Information, Knowledge and Learning: Some Issues Facing Epistemology and Education in a Digital Age.* Journal of Philosophy of Education, Vol. 34, No. 1, 2000. (Blackwell Publishers UK).

Lebo, H., (writer) (2004). *The Digital Future Report. Surveying the Digital Future. Year Four.* University of Southern California.

Lyotard, J.F., (1979). *The Postmodern Condition. A Report on Knowledge.* Translation from French by Bennington G., Massumi B. (1986) (Manchester University Press).

Lyotard, J. F., (1997). *Postmodern Fables.* Georges Van Den Abbeele (Translator) (University of Minnesota Press, April 1999, USA) in Blake, N., Smeyers, P., Smith, R., Standish, P. (2000) "Education in an Age of Nihilism." (Routledge Falmer, UK).

Marchionini, G., (1988) *Hypermedia and Learning: Freedom and Chaos*, Educational Technology, November, 8-12 "Cognitive Effects of Web Page Design." In: Berry, L.,H. (2000) in "Instructional and Cognitive Impacts of Web-Based Education." In: Abbey, B (Ed). (Idea Group Publishing. Hershey USA).

McCrory Wallace, R. (2004) *A Framework for Understanding Teaching with the Internet.* American Educational Research Journal, Summer 2004, Vol.41, No.2, pp. 447-488. (ProQuest Education Journals.)

McCulloch, G. (1997). *Marketing the Millennium: Education for the twenty-first century.* In: Hargreaves, A., (2000). "Editor in Chief's Introduction Representing Educational Change." Journal of Educational Change 1: 1-3, 2000. (Kluwer Academic Publishers. The Netherlands).

McKenzie, J., (1998). *Grazing the Net. Raising a Generation of Free-Range Students.*

Phi Delta Kappan pp. 26-31, September 1998, Vol.80 Issue 1. (Phi Delta Kappan, Bloomington, 1998)

McLoughlin, C., (1999). *Culturally responsive technology use: developing an on-line community of learners.* British Journal of Educational Technology, Volume 30, No.3, pp. 231-243. (Blackwell Publishers Oxford, UK).

Moore, D.W., (2000). *Americans Say Internet Makes Their Lives Better.* Gallups New Service. http://www.gallup.com/poll/content/?ci=3202 (Accessed April 2005).

National Development Plan of Malta 2003-2006. *Education: Information and Communication Technology.* http://schoolnet.gov.mt/ictprimary/PDFs/Plan.pdf (Accessed March 2005).

NGFL. (The National Grid for Learning) (2005). The Use of ICT in Learning and Teaching. HM Inspectors of Schools. http://www.ltscotland.org.uk/teachers/ICTLT/index.asp#essential.(Accessed April 2005).

Nonaka, I., (1998). *Hypertext versus Knowledge Management, Nonaka's Knowledge Creation Framework*in Nonaka, I, Konno, N., (1998) The concept of "Ba": Building foundation for knowledge Creation. California Management Review Vol. 40, No. 3, Spring 1998. http://www.cyberartsweb.org/cpace/ht/thonglipfei/nonaka_seci.html (Accessed March 2005).

O'Hagard, C, (1998). *Like Tomorrow, the next generation never comes.* Educational Technology & Society [2(2)] Formal Discussion Summary December 1999. http://www.ifets.info/journals/2_2/formal_discussion_1298.html (1 of 8) (Accessed may 2005).

O'Sullivan, E., (1999). *Transformative Learning. Educational Vision for the 21st Century.* (Zed Books, London).

Poster, M., (1995). *The Second Media Age.* In Lankshear, C., Peters, M., Knobel, M. (2000). "Information, Knowledge and Learning: Some Issues Facing Epistemology and Education in a Digital Age." Journal of Philosophy of Education, Vol. 34, No. 1, 2000. (Blackwell Publishers UK).

President's Committee of Advisors on Science and Technology. (1997) Panel on Educational Technology. Report to the President on the Use of Technology to Strengthen K-12 Education in the United States, March 1997 (pp. 1-136). http://clinton4.nara.gov/WH/EOP/OSTP/NSTC/PCAST/k-12ed.html (Accessed May 2005).

Robertson, J.W., (2003). *Stepping Out of the Box: Rethinking the Failure of ICT to Transform Schools.* Journal of Educational Change 4:323-344. (Kluwer Publishers. The Netherlands).

Rosenberg, M.,J., (2001). *e-Learning. Strategies for Delivering Knowledge in the Digital Age.* (McGraw-Hill USA)

Scheidlinger, Z. (1999) *Education calls for a new Philosophy.* Educational Technology and Society, 2(3). Advanced e- services for the Knowledge Society research Unit (ASK).

Sellinger, M., (2001). *Learning Information and Communications Technology Skills and the Subject Context of the Learning.* Journal of Information Technology for Teacher Education, Vol. 10, Nos. 1 and 2, 2001. (Triangle Journals, Oxford UK).

Shi, L., Reeder, K., Slater, T., Kristjansson, C., (2004). *Tensions in Learning Content and Technology: the experience of education students in a web-based research project.* Technology, Pedagogy and Education, Vol. 13, No. 1, 2004. (Triangle Journals, Oxford UK).

Smith, R.A., (1989) *On the third realm-on observing a different society,* The Journal of Aesthetic Education 23.1, pp.5-7 in Blake N., Standish P., (Eds) (2000). "Enquiries at the Interface: Philosophical Problems of Online Education." Blackwell Publishers Ltd. UK.

Standish, P., (2000) *Fetish for Effect.* Journal of Philosophy of Education, Vol. 34, No. 1, 2000, pp. 151-168. (Blackwell Publishers Oxford).

Tait, B., (1997). *Constructive Internet Based Learning.* http://homepages.uel.ac.uk/W.H.Tait/Learning/Cibl.htm (Accessed March 2005).

Thagard, P., (1997). *Internet Epistemology: Contributions of New Information Technologies to Scientific Research* http://cogsci.uwaterloo.ca/Articles/Pages/Epistemology.html (Accessed April 2005).

The World Bank Group, 2001. *Globalization.* The World Bank Group, 2001. http://www1.worldbank.org/economicpolicy/globalization/ (Accessed may 2005).

Thrift, N., (1996). *New Urban Eras and Old Technological Fears: Reconfiguring the Goodwill of Electronic Things.* Urban Studies, Vol. 33, No. 8, pp: 1463-1493. (Carfax Publishing, UK).

Underwood J.D.M., Underwood G., (1990). *Computers and Learning. Helping children acquire thinking skills*. (Blackwell Publishers Ltd. UK).

van Dam, A., (1999). *Education: the Unfinished Revolution.* ACM Computing Surveys, Vol.31 4es December 1999. A Symposium at Stanford University.

Viteli, J., (2000). *Finnish Future: From elearning to mlearning.* ASCILITE 2000 Conference Proceedings. http://ascilite.org.au/conferences/coffs00/papers/jarmo_viteli.pdf (Accessed March 2005).

Weston, J., (1994) *Old Freedoms and new technologies: the evolution of community networking.* Paper presented at the free speech and Privacy in the Informtion Age, University of Waterloo. In Lankshear, C., Peters, M., Knobel, M. (2000). "Information, Knowledge and Learning: Some Issues Facing Epistemology and Education in a Digital Age." Journal of Philosophy of Education, Vol. 34, No. 1, 2000. (Blackwell Publishers UK).