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The Relevance of E-Learning in Higher Education

ABSTRACT: *E-learning is a technology which supports teaching and learning via a computer and the web technology. It bridges the gap between a teacher and a student in two different geographical locations. Advancement in internet and multimedia technology is the basic enable for e-learning. E-learning applications facilitate online access to learning content and administration. Despite much enthusiasm about the roles of technology in education, its role in transforming teacher learning, in ways aligned with advances in the learning sciences and contemporary socio-cultural perspectives, few changes have occurred. While many teacher educators are turning away from technology, after early attempts met with mitigated success, some are pushing the boundaries of teacher education and professional activity systems. This paper identifies and analyzes emerging trends and models in e-learning for teacher education and professional development from the developing research base, both international trends and current developments. Educational institutions and teaching staff have many benefits due to emergence of modern technology. Teachers have their own networks through which they connect themselves with other teachers across the globe. Institutions have web-supported classrooms. Similarly, it also enhanced the responsibilities of schools, colleges, and universities that should have such teachers who can produce such students, who after receiving their education can adjust themselves at any platform.*

KEY WORD: *E-learning, higher education, multimedia technology, teaching and learning, networks, online access, and professional development.*

IKHTISAR: *Artikel ini berjudul "Relevansi E-Learning di Perguruan Tinggi". E-learning adalah teknologi yang mendukung pengajaran dan pembelajaran melalui komputer dan teknologi web. Ia menjembatani kesenjangan antara guru dan siswa di dua lokasi geografis yang berbeda. Kemajuan internet dan teknologi multimedia adalah kemampuan mendasar untuk e-learning. Aplikasi e-learning memfasilitasi akses online untuk konten dan administrasi pembelajaran. Meskipun banyak antusiasme tentang peran teknologi dalam pendidikan, perannya dalam mengubah pembelajaran guru, dengan menyelaraskan kemajuan ilmu pembelajaran dengan perspektif sosial-budaya kontemporer, masih sedikit perubahan telah terjadi. Sementara banyak pendidik guru yang berpaling dari teknologi, setelah upaya awal menemui kekurang-berhasilan, ada pula yang mendorong mengatasi batas-batas pendidikan guru dan sistem kegiatan profesional. Makalah ini mengidentifikasi dan menganalisis tren dan model dalam e-learning untuk pendidikan guru dan pengembangan profesional dari penelitian dasar dan pengembangan, baik secara tren internasional maupun perkembangan saat ini. Lembaga pendidikan dan staf pengajar memiliki banyak manfaat karena munculnya teknologi modern ini. Paru guru memiliki jaringan mereka sendiri di mana mereka dapat menghubungkan diri dengan guru-guru lain di seluruh dunia. Lembaga-lembaga memiliki ruang kelas berbasis web yang mendukung. Demikian pula, ianya meningkatkan tanggung jawab sekolah, perguruan tinggi, dan universitas yang harus memiliki guru-guru yang dapat menghasilkan para siswa, setelah menerima pendidikan, mereka dapat menyesuaikan diri dengan program apapun.*

KATA KUNCI: *E-learning, perguruan tinggi, teknologi multimedia, pengajaran dan pembelajaran, jaringan, akses online, dan pengembangan profesional.*

INTRODUCTION

E-learning is the process of extending learning or delivering instructional resource sharing opportunities, to locations away from a classroom, building or site, to another classroom, building or site by using video, audio, computer, multimedia communications, or some combination of these with other traditional delivery methods. E-learning comprises all forms of electronically supported learning and teaching.

The information and communication

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systems, whether networked learning or not, serve as specific media to implement the learning process. The term will still most likely be utilized to reference out-of-classroom and in-classroom educational experiences via technology, even as advances continue in regard to devices and curriculum. E-learning is essentially the computer and network-enabled transfer of skills and knowledge. E-learning applications and processes include web-based learning, computer-based learning, virtual education opportunities, and digital collaboration. Content is delivered via the internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM. It can be self-paced or instructor-led and includes media in the form of text, image, animation, streaming video, and audio.

Abbreviations like CBT (*Computer-Based Training*), IBT (*Internet-Based Training*) or WBT (*Web-Based Training*) have been used as synonyms to e-learning. Today, one can still find these terms being used, along with variations of e-learning such as *e-learning, Elearning,* and *eLearning*. The terms will be utilized throughout this article to indicate their validity under the broader terminology of *E-learning*. The worldwide e-learning industry is estimated to be worth over $48 billion according to conservative estimates. Developments in internet and multimedia technologies are the basic enabler of e-learning, with consulting, content, technologies, services, and support being identified as the five key sectors of the e-learning industry.

In today's knowledge economy, learning is needed to survive and to thrive. In this sense, knowledge is power and proliferation of knowledge through e-learning is not a luxury, but a necessity for current and future generations. In this context, distance learning has become an imperative. The need is constant, while the nature of our society and economy drives the need for learning. The demand and use of alternatives to the typical classroom setting has been ongoing for more than 100 years from correspondence courses in paper form through video and computer access.

E-learning is the next level of learning beginning as a revolution, and the internet has now become a part and parcel of the 21st century world. Everything and everyone is getting online. And those who are not doing so are missing out on the immense power of this modern age wonder. Can the field of education be any far behind? Indeed not, as is evident from the advent of E-learning! E-learning is a term that is used to refer to computer-based learning. It uses computer based training and teaching materials, online conferencing, discussion boards, e-mail, computer-aided assessment, and other related methods. In other words, the computer screen, keyboard, and the internet connection are all set to gradually replace of the blackboard, chalk, and the physical school.

The most attractive feature of e-learning is that it is student-centered. It accommodates individual preferences and needs. At the same time, it empowers students of various backgrounds to have equal access to the best resources and referral material, lecture sessions, tutoring, and experienced teachers. Most professionals interested in the use of technology in education understand the importance of an e-learning course site, whether the course is taught completely online, or in a hybrid environment where the instructor also has some face-to-face interaction with students. Today, e-learning companies offer a variety of e-learning services such as building and designing training courses, offering web-based programs for learning, online learning, and content management (Mason, 2002).

The services and format of e-learning allow for the following listed benefits, to name only a few. *First*, e-learning allows any user to host live classes on any topic. A high school chemistry teacher in California can schedule his/her own class with live video and audio feeds and have a global student audience. *Second*, the format allows students to learn easily for the standardized tests by downloading the study material they want, rather than paying hefty bills to tuitions. *Third*, it also allows the students to improve their scores in the standardized tests, by taking as many tests as they want. *Fourth*, the e-learning format allows students to speed up and slow down as they deem necessary.

Students can choose the subject according to their interest level .There is more flexibility in terms of time limit or age barrier. There are an immense lot of opportunities and a host of variety to choose from. And, *fifth,* the online environment allows for a learning environ where there is a better focus on study due to the effect of saved efforts, time and lesser hassles. E-learning opens up a new world of studying comfortably and with better results.

In the early 1960's, Stanford University psychology professors, Patrick Suppes and Richard C. Atkinson, experimented with using computers to teach math and reading to young children in elementary schools in East Palo Alto, California. Stanford's Education Program for Gifted Youth is descended from those early experiments. Early e-learning systems, based on Computer-Based Learning/Training, often attempted to replicate autocratic teaching styles, whereby the role of the e-learning system was assumed to be for transferring knowledge, as opposed to systems developed later based on Computer Supported Collaborative Learning (CSCL), which encouraged the shared development of knowledge (cited in Wagner, Hassanein & Head, 2008).

As early as 1993, William D. Graziadei described an online computer-delivered lecture, tutorial and assessment project using electronic mail. In 1997, William D. Graziadei *et al.* published an article entitled "Building Asynchronous and Synchronous Teaching-Learning Environments: Exploring a Course/Classroom Management System Solution". They described a process at the State University of New York (SUNY) of evaluating products and developing an overall strategy for technology-based course development and management in teaching-learning. The product(s) had to be easy to use and maintain, portable, replicable, scalable, and immediately affordable, and they had to have a high probability of success with long-term cost-effectiveness. Today many technologies can be, and are, used in e-learning, from blogs to collaborative software, e-Portfolios, and virtual classrooms.

Most e-learning situations use combinations of these techniques (cited in http://horizon.unc.edu/projects/monograph/CD/Technological_Tools/Graziadei.html, 9/9/2013).

E-learning is also utilized by public K–12 schools in the United States of America. Some e-learning environments take place in a traditional classroom; others allow students to attend classes from home or other locations. There are several states that are utilizing cyber and virtual school platforms for e-learning across the country that continued to increase. Virtual school enables students to log into synchronous learning or asynchronous learning courses anywhere there is an internet connection. Technologies kits are usually provided that include computers, printers, and reimbursement for home internet use. Students are to use technology for school use only and must meet weekly work submission requirements. Teachers employed by K–12 online public cyber schools must be certified teachers in the state they are teaching in. Cyber schools allow for students to maintain their own pacing and progress, course selection, and provides the flexibility for students to create their own schedule.

E-learning is increasingly being utilized by students who may not want to go to traditional brick and mortar schools due to severe allergies or other medical issues, fear of violence and school bullying, and students whose parents would like to home school but do not feel qualified. Cyber schools create a safe haven for students to receive a quality education, while almost completely avoiding these common problems. Cyber charter schools also often are not limited by location, income level or class size in the way brick and mortar charter schools are (Elton, 1999).

The environment of higher education is evolving rising costs, shrinking budgets, and an increasing need for distance education are causing educational institutions to re-examine the way that education is delivered. In response to this changing environment, e-learning is being implemented more and more frequently in higher education, creating new, and exciting opportunities for both educational institutions and students. E-learning, or electronic learning, has

been defined a number of different ways in the literature. In general, e-learning is the expression broadly used to describe "instructional content or learning experience delivered or enabled by electronic technologies" (Golden *et al.*, 2006).

Some definitions of e-learning are more restrictive than this one, for example limiting e-learning to content delivery via the internet. The broader definition, which will be used for the purposes of this article, can include the use of the internet, intranets/extranets, audio- and video-tape, satellite broadcast, interactive TV, and CD-ROM, not only for content delivery, but also for interaction among participants. More recently, this definition can be further expanded to include mobile and wireless learning applications.

The e-learning models of higher education today find their roots in conventional distance education. Initially introduced to allow individuals in remote and rural areas to gain access to higher education, distance learning has evolved significantly over time. Technological advancement has been the major inspiration for change, beginning with the integration of radio broadcasting in the 1920's. More recently, the advent of the internet has enabled tremendous innovation in the delivery of post secondary education. As time goes by, more and more people gain access to the internet, the cost of computer ownership decreases, and overall computer literacy increases. These trends provide educational institutions an ideal channel for the delivery of educational content (Kershaw, 1996).

IMPORTANCE, RELEVANCE, AND BENEFITS OF E-LEARNING

The internet is a technological development that has the potential to change, not only the way society retains and accesses knowledge but also to transform and restructure traditional models of higher education, particularly the delivery and interaction in and with course materials and associated resources. Utilising the internet to deliver e-learning initiatives has created expectations both in the business market and in higher education institutions. Indeed, e-learning

has enabled universities to expand on their current geographical reach, to capitalize on new prospective students, and to establish themselves as global educational providers (Ronteltap & Eurelings, 2002). This paper examines the issues surrounding the implementation of e-learning into higher education, including the structure and delivery of higher education, the implications to both students and lecturers, and the global impact on society.

In today's new economy, value is greatly enhanced by knowledge. The terms "new economy and knowledge economy" go hand in hand and are complimentary assets. The growth of the e-learning industry is in a high growth cycle. Companies are exploiting opportunities to target this cycle. Distance learning is a tool for e-commerce and used to leverage the intellectual capital of commercial and educational organizations its most important asset. New companies are building profitable businesses by developing or using the next generation of content, services and technologies for business, academic and consumer markets (Hawkes & Cambre, 2000).

Today, technology leads the way to productivity and the internet has become the vehicle of choice for markets and educational institutions. Both John Chambers, President and CEO (Chief Executive Office) of Cisco Systems, and Bill Gates state that the next big killer application for the internet is going to be education. Education over the internet is going to be so big, it is going to make e-mail usage look like a rounding error. Bill Gates, further, defines the importance by saying that the next killer app as the use of a technology so attractive to consumers that it fuels market forces and makes an invention all but indispensable, even if it wasn't anticipated by the inventor (cited in Macdonald & Twining, 2002).

Distance learning via the internet, combined with multi-media platforms, can satisfy the demand for alternative forms of education. Distance education uses the work of the best instructors, an extensive collection of resources and provides a 24/7 approach. It serves as an equalizer in terms of access and equity, provides a quality product at a lower

cost, and a buffer against the vicissitudes of an unpredictable economy. The use of electronic media for flexible course delivery provides a new context for teaching and learning. The emphasis on a synchronicity brought by email and online conferencing brings with it an increased scope for flexibility in study routines, and meets a growing demand for part time study, continuous professional development, and lifelong learning.

Electronic media offer a variety of ways of presenting or structuring learning opportunities which were not previously available on distance courses. They offer new ways to access and combine the information, and the possibility to keep in touch on a more regular and continuous basis, so that students need no longer work in isolation, but belong to an electronic "community of learners".

E-learning has recently achieved prominence as the "philosopher's stone" for future development in Higher and Further Education, and yet there is little common understanding as to its meaning (Golden *et al.*, 2006). R. Mason (2002) outlines the wide spectrum of interests and understandings attached to the term, from those with social constructivist approaches, whose aim is to make use of the communicative potential of online learning, to those who have a more behaviourist approach, and see it as a convenient medium for content delivery and testing students.

There is also a wide variation in the types of student who may be involved in e-learning, in terms of age or motivation, their situation, which may be campus based, or remote, or a combination of both, and also the discipline which they are studying. As part of this debate, a recent manifesto describes networked e-learning as follows:

> Those learning situations and contexts which, through the use of ICT (Information and Communication Technology), allow learners to be connected with other people and with shared information rich resources. Networked e-learning also views learners as contributing to the development of these learning resources and information of various kinds and types (Macdonald & Twining, 2002).

This paper concentrates on those courses where a constructivist approach is adopted, by using online media to support distributed collaborative interaction and dialogue, and sometimes access to information rich resources. Such courses place importance on understanding, rather than on memorizing and reproducing facts, and on the contribution of social interaction and collaboration to learning. Constructivist philosophy accommodates a family of closely related pedagogies, which optimize the potential of networked environments (Kukla, 2000). The family includes collaborative learning, activity-based learning, resource-based learning, and problem-based learning.

These four pedagogies lay different emphases on particular facets of constructivist philosophy, as their names suggest. They all operate by providing opportunities for students to learn by engaging in activities, which might involve collaborative work, or problem solving, or open access to electronic resources (Gray, 2011). In practice, many networked courses adopt all four approaches to varying degrees, alongside more conventional modes of delivery. The pioneers in e-learning have tended to concentrate their studies on postgraduate courses, often having small numbers of students, where e-learning has been the subject of study, as well as being the medium used for interaction. Many useful lessons have been learnt from these courses, however, e-learning is rapidly being mainstreamed at all levels of study, for a wide variety of courses.

At the Open University of United Kingdom, there are now 275 courses involving 100,000 students in which online media are used for tuition. Over 16,000 first-class conferences have been set up for course related tuition, as well as student run peer support through the student union. In addition, by 2005, all students will be encouraged and expected to use web based systems for administrative services and non-academic student support; this will no doubt raise the general level of computer literacy, and also student expectations of online support (McDowell, 2002).

E-learning companies all forms of electronically supported learning and teaching.

The information and communication systems, whether networked or not, serve as a specific media to implement the learning process. The growth of e-learning gives a nature of change in higher education. According to the findings of the Alfred P. Sloan Foundation in 2010, there has been an increase of around 12-14 percent per year on average in enrolment for fully online learning over the five years 2004-2009 in the post-secondary system, compared with an average of approximately 2 percent per year in enrolments overall (cited in http://www.sloan.org, 9/10/2013).

The aim of using e-learning is to improve the quality of the learning experience for students, the drivers of change are numerous, and learning quality ranks poorly in relation to most of them. The importance of using e-learning in higher education is to create an environment which learners in higher education become more advance, make the significant differences, and increase the tendency to create a Virtual Learning Environment (VLE). Firstly, the importance of using e-learning in higher education is to create an environment which learners become more advance. When the students use e-learning, they creating an environment in which learners can explore, manipulate, and experiment.

The features of the digital environment are fully controlled by the program, so that it can be designed to offer as much or as little freedom to the learner as is appropriate to their level of mastery. In the others word, e-learning increases their capability in understanding and critiquing an existing theory. Preference example for a mathematical model of a well-researched system, such as population dynamics in biology, or unemployment fluctuations in economics. An interactive simulation enables students to explore how the model behaves according to the way they change parameters. Technology has revolutionized business; now it must revolutionize learning (O'Neill, O'Donoghue & Lord, 2000).

In the 21st century, people have to learn more than ever before. Especially for global organizations, live classroom-based training is becoming too costly and cumbersome. Even if employees had the time to attend all the courses and seminars and to read all the books and reports they should to remain up-to-date in their area of work, the cost of such learning would be prohibitive (Hawkes & Cambre, 2000). The need to transform how organizations learn points to a more modern, efficient, and flexible alternative: e-learning. The mission of corporate e-learning is to supply the workforce with an up-to-date and cost-effective program that yields motivated, skilled, and loyal knowledge workers.

Anywhere, anytime, and anyone. The internet can offer the logical solution for a company's education and training objectives. Approximately, 80% of the professional workforce already uses computers on the job. Technical obstacles, such as access, standards, infrastructure, and bandwidth, will not be an issue in a few years. The growth of the www (world wide web), high-capacity corporate networks, and high-speed desktop computers will make learning available to people 24 hours a day, seven days a week around the globe (Rubens, Kaplan & Okamoto, 2011). This will enable businesses to distribute training and critical information to multiple locations easily and conveniently. Employees can then access training when it is convenient for them, at home or in the office.

Substantial cost savings due to elimination of travel expenses. When delivered through technology based solutions, training is less expensive per end user due to scalable distribution and the elimination of high salaries for trainers and consultants. The biggest benefit of e-learning, however, is that it eliminates the expense and inconvenience of getting the instructor and students in the same place. According to *Training Magazine*, corporations save between 50-70% when replacing instructor-led training with electronic content delivery (http://www.trainingmag.com, 9/10/2013).

Opting for e-learning also means that courses can be pared into shorter sessions and spread out over several days or weeks, so that the business would not lose an employee for entire days at a time. Workers can also improve productivity and use their own time more efficiently, as they no longer need to travel or fight rush-hour traffic to get to a class.

Just-in-time access to timely information. Web-based products allow instructors to update lessons and materials across the entire network instantly. This keeps content fresh and consistent and gives students immediate access to the most current data. Information can be retrieved just before it is required, rather than being learned once in a classroom and subsequently forgotten. *Training Magazine* again reported that technology-based training has proven to have a 50-60% better consistency of learning than traditional classroom learning or c-learning (http://www.trainingmag.com, 9/10/2013).

Higher retention of content through personalized learning. Technology-based solutions allow more room for individual differences in learning styles. They also provide a high level of simulation that can be tailored to the learner's level of proficiency. With 24 x 7 access, people can learn at their own pace and review course material as often as needed. Since they can customize the learning material to their own needs, students have more control over their learning process and can better understand the material, leading to a 60% faster learning curve, compared to instructor-led training. The delivery of content in smaller units, called "chunks", contributes further to a more lasting learning effect (Collis, de Boer & Slotman, 2001). Whereas the average content retention rate for an instructor-led class is only 58%, the more intensive eLearning experience enhances the retention rate by 25-60%. Higher retention of the material puts a higher value on every dollar spent on training.

Improved collaboration and interactivity among students. In times when small instructor-led classes tend to be the exception, electronic learning solutions can offer more collaboration and interaction with experts and peers as well as a higher success rate than the live alternative. Teaching and communication techniques, which create an interactive online environment, include case studies, story-telling, demonstrations, role-playing, simulations, streamed videos, online references, personalized coaching and mentoring, discussion groups, project teams, chat rooms, e-mail, bulletin boards, tips, tutorials, FAQs (Frequently Asked Questions), and wizards.

Distance education can be more stimulating and encourage more critical reasoning than a traditional large instructor-led class because it allows the kind of interaction that takes place most fully in small group settings. Studies have shown that students who take online courses are typically drawn into the subject matter of the class more deeply than in a traditional course because of the discussions they get involved in (Moore & Kearsley, 2004). This engagement is further facilitated by the fact that instructors do not monopolize attention in an online environment. Another study found that online students had more peer contact with others in the class, enjoyed it more, spent more time on class work, understood the material better, and performed, on average, 20% better than students who were taught in the traditional classroom (Rovai, 2003).

Online training is less intimidating than instructor-led courses. Students taking an online course enter a risk-free environment in which they can try new things and make mistakes without exposing themselves. This characteristic is particularly valuable when trying to learn soft skills, such as leadership and decision making. A good learning program shows the consequences of students' actions and here/why they went wrong. After a failure, students can go back and try again. This type of learning experience eliminates the embarrassment of failure in front of a group. With all of these advantages of taking classes online, it is hard to imagine why anyone would opt to sit in a lecture to learn new information. There are online classes available free on a multitude of topics, just start surfing, find one to your liking, and start learning (Barrett & Paradis, 2008).

Eight Step Process. Entering the 21st century, with the internet and world wide web leading the way, distance learning is already affecting the lives of millions of children, teens, and adults through interventions in their patterns of learning. Beyond enabling learners to independently acquire information and interact one-on-one with instructors in an enhanced learning environment, distance learning offers the means to dramatically alter the structure

of the educational enterprise, as we know it today. Simultaneously, it rapidly improves educational attainment levels in developing nations and regions of the world.

However, best practice effectiveness for e-learning is in the design and implementation of the content to be delivered. Without a sound educational model, successful education via e-learning will fail both the designer/instructor and distance learner. The model for a successful and effective e-learning architecture is an eight-step process, as follows:

Step 1: Needs Assessment & Assessment of Client's Existing Educational. This phase consists of the following activities: (1) Existing Learning systems analysis; (2) Training needs analysis; (3) Business domain analysis; (4) Gap analysis; and (5) Prevalent learning styles.

Step 2: Formulation of an E-Learning Strategy. In this phase, we determine the needs for type of technologies, contents, delivery, governance issues, competency frameworks, and learner objectives. Strategies are to be designed to work within the given financial and time-to-delivery parameters.

Step 3: Solution Architecture Design. Architectural decisions are based on the outcome of the e-learning strategy and address issues like performance, high-availability, scalability, and usability.

Step 4: Prototyping. Various prototypes are developed to select the best possible approach to capture clients vision and gain feedback without committing to a large-scale investment. In many cases, prototypes are made that illustrate the blending of the creative, instructional, and technical concepts. These prototypes allow experiencing the e-learning functionality, design features, and creative approaches that will be employed in the project.

Step 5: Design, Development and Integration of Content. This phase involves the following steps: (1) Migration and re-usability of existing on-line contents, if any; (2) Review of available off-the-shelf contents in light of the learning course; (3) Objectives; and (4) Development of new on-line contents, if needed.

Step 6: Implementation, Deployment, and System Integration. This is the most intensive and the longest phase of the project. This involves programming, testing, and deployment of the complete solution. All the learning components are also integrated in this phase to produce the complete solutions.

Step 7: Client Training on E-Learning Solutions. "Investment in human capital" is the mantra that should be followed by the designer. Learners are trained to most effectively use the e-learning solution to produce the best Return on Investment (RoI).

Step 8: Support. The implementation should offer 24 x 7 customer support after the successful implementation of the solution to ensure maximum up time of the solution. The client gets the support from the designer team via on-site presence, voice, emails, web-chat, or any combination of these (Bentley & Wilsdon, 2003).

QUESTIONING AND CHANGING ON E-LEARNING FOR HIGHER EDUCATION

First, **what is a competent e-learner?** Courses using electronic networks make certain demands on the students who study them. Inevitably, using a networked computer as a study tool involves basic ICT (Information and Communication Technology) skills which need to be mastered, and this eventually leads to a familiarity with the relevant hardware and software tools. Beyond this, students need to learn how to use the computer as a study tool. They may need to accommodate screen based study, with its limitations on flexibility, and the implications for time management; in addition to learning how to manage files effectively.

Approaches to writing and sharing information in electronic form offer enhanced possibilities for the re-drafting of scripts, as well as the use of information from a variety of sources. This presupposes some understanding of plagiarism, and the role of academic evidence in developing an argument. Arguably, all these skills and adaptations, once learnt, are fairly readily used in a variety of situations.

Courses which are networked will by definition offer students greater access to the opinions of peers and the resources of the web, and students will need to develop a self-directed approach study, and adopt a critical approach to these resources. Of course, under traditional university models of teaching and

learning, encouraging students to develop any independence and self-direction in learning is a lengthy and gradual process, which develops throughout a graduate course of study.

Since networked courses with constructivist approaches have been introduced at all levels of the undergraduate curriculum, e-learners may be exposed to unfamiliar demands at an early stage in their academic career. Self-directed study using electronic networks requires competence in two major areas: information literacy and online collaborative learning, in line with the need to cope with collaborative interaction, and access to information rich resources. The term "information literacy" has been in use particularly in the USA (United States of America) and Australia, in connection with self-directed lifelong learning (Lau, 2006).

Its characteristics include recognising the need for information, being able to identify and locate it, gaining access to it, then evaluating, organising it, and using it effectively. Students need to recognise the gaps in their knowledge, in order to establish what they need to find out, and J. Hill (1999) underlines the significance of subject knowledge, in providing the framework for further exploration and research, in addition to confidence and metacognition.

It is clearly not enough to teach students searching techniques, and then to assume that they will be competent investigators. Indeed, the support of students in this area is highly problematic, and L. McDowell (2002) describes a wide spectrum of approaches to the use of electronic resources within courses. There is similar complexity in online collaborative learning. G. Salmon (2000) also proposes a number of progressive stages of development, which include access and motivation, socialisation, information exchange, knowledge construction, and development. These stages illustrate the interplay between competence, and affective factors such as growing confidence, motivation, and group dynamics.

And, of course, if students are to communicate effectively within an academic discipline, then, they need to become familiar with the language of a discipline and the academic genre. M. Lea & B. Street (1998) maintain that this familiarity with the discourse is a defining factor in students' abilities to read and write appropriately within a discipline. In fact, this familiarity grows as they practice writing conference messages on course topics, and reading, or eventually responding to messages from others. Finally, if students are required to collaborate to undertake a common task, as opposed to making optional contributions to a conference, then they need to practise team working and negotiation skills, group decision making and task management.

Again, affective issues may be significant here, for example group cohesion, and the evolution of mutual trust. It follows that the whole process of competence in online collaboration certainly requires practice, and will take some time to develop. A significant body of research supports the view that the design of assessment is critical in determining the direction of student effort, and that the formative value of assessment is vital in providing a channel of communication between students and their mentors. This role for formative assessment is increasingly important for campus based universities, as well as in a traditional distance learning context. But to what extent can the formative power of assessment be deployed to develop competent e-learners, and does it differ in any way from formative assessment to develop competent learners?

Second, **why is e-learning important for higher education?** A student who is learning in a way that uses information and communication technologies (ICTs) is using e-learning. These interactive technologies support many different types of capability: internet access to digital versions of materials unavailable locally internet access to search and transactional services interactive diagnostic or adaptive tutorials interactive educational games remote control access to local physical devices personalized information; guidance for learning support simulations or models of scientific systems communications tools for collaboration with other students and teachers tools for creativity; design virtual reality environments for development and manipulation data analysis, modeling or

organization tools; and applications electronic devices to assist disabled learners.

For each of these, there is a learning application that could be exploited within HE (Higher Education). Each one encompasses a wide range of different types of interaction – internet access to services, for example, includes news services, blogs, online auctions, self-testing sites, etc. Moreover, the list above could be extended further by considering combinations of applications. Imagine, for example, a remotely controlled observatory webcam embedded in an online conference environment for astronomy students; or a computer-aided design device embedded in a role-play environment for students of urban planning (Laurillard, 2004).

The range and scale of possible applications of new technologies in HE is almost beyond imagining because, while we try to cope with what is possible now, another technological application is becoming available that will extend those possibilities even further. Everything will need updating again when 3G (third-generation) mobile phones begin to have an impact on our behavior. Never mind, people keep the focus on principles and try to maintain the equanimity in the face of these potentially seismic changes.

E-learning is defined for purposing here as the use of any of the new technologies or applications in the service of learning or learner support. It is important, because e-learning can make a significant difference: to how learners learn, how quickly they master a skill, how easy it is to study, and, equally important, how much they enjoy learning. Such a complex set of technologies will make different kinds of impact on the experience of learning: *cultural* – students are comfortable with e-learning methods, as they are similar to the forms of information search and communications methods they use in other parts of their lives; *intellectual* – interactive technology offers a new mode of engagement with ideas via both material and social interactivity online; *social* – the reduction in social difference afforded by online networking fits with the idea that students should take greater responsibility for their own learning; and *practical* – e-learning offers the ability to manage quality at scale,

and share resources across networks; its greater flexibility of provision in time and place makes it good for widening participation.

There is also a financial impact. Networks and access to online materials offer an alternative to place-based education which reduces the requirement for expensive buildings, and the costs of delivery of distance learning materials. However, learners still need people support, so the expected financial gains are usually overwhelmed by the investment costs of a new system and the cost of learning how to do it (Laurillard, 2004).

Third, **changing higher education towards the use of e-learning**. E-learning could be a highly disruptive technology for education – if we allow it to be. We should do, because it serves the very paradigm shift that educators have been arguing for throughout the last century. Whatever their original disciplines, the most eminent writers on learning have emphasised the importance of active learning. The choice of language may vary – Dewey's inquiry-based education, Piaget's constructivism, Vygotsky's social constructivism, Bruner's discovery learning, Pask's conversation theory, Schank's problem-based learning, Marton's deep learning, and Lave's socio-cultural learning – but the shared essence is the recognition that learning concerns what the *learner is doing*, rather than what the teacher is doing, and the promotion of active learning in a social context should be the focus of our design of the teaching-learning process (cited in Ashwin ed., 2004).

It is especially the social situatedness of learning, in the Vygotskyan tradition, that is the focus of David McConnell's chapter in his book. If the organisation of teaching and learning in HE (Higher Education) were driven by the insights of these scholars, then e-learning would have been embraced rapidly as the means to deliver active learning. But change in HE requires a subtler understanding of the forces at work, and here Lewis Elton is a valuable guide (cited in Laurillard, 2004).

Another source for this kind of analysis is the literature on knowledge management, which draws our attention to the importance of continual innovation, if an organisation is to remain competitive. P.M. Senge's

Table 1:
New Media and Delivery Technologies for Information Processing and Communications Compared
with Their Functional Equivalents for Reading and Writing

Date	New Technology	Old Technology Equivalent	Learning Support Function
1970's	Interactive computers	Writing	New medium for articulating and engaging with ideas
	Local hard drives and floppy discs	Paper	Local storage with the user
1980's	WIMP interfaces	Contents, indexes, page numbers	Devices for ease of access to content
	Internet	Printing	Mass production and distribution of content
	Multimedia	Photography, sound, and film	Elaborated forms of content presentation
1990's	World Wide Web	Libraries	Wide access to extensive content
	Laptops	Published books	Personal portable access to the medium
	Email	Postal services	Mass delivery of communications messages
	Search engines	Bibliographic services	Easier access to extensive content
	Broadband	Broadcasting, telephones	Choice of elaborated content and immediacy of communication
2000's	3G Mobiles	Paperbacks	Low-cost access to elaborate content
	Blogs	Pamphlets	Personal mass publishing

Source: Diana Laurillard (2014:8).

analysis derives from a systems approach, and concludes that the organisation must be continually expanding its capacity to create its future, so that adaptive learning must also be joined by generative learning – learning that enhances the capacity to create (Senge, 1993). The quote captures the twin tasks of both generating new knowledge, and monitoring existing activities, to ensure adaptive change in response to the external environment.

Similarly, I. Nonaka (1994) made the link between knowledge creation and competition, and draws attention to the relationship between individual learning and organisational learning. Organisational knowledge creation is seen as a continual dynamic process of conversion between tacit (experiential) and explicit (articulated) knowledge, and iterating between the different levels of the individual, the group, and the organisation. Again, the network, rather than the directed graph, is the optimal model for innovation, and the dialogic process between individuals and groups at different levels of description of the organisation, is very similar to the principles embodied within the Conversational Framework for learning (Kukla, 2000; and Laurillard, 2002).

The sequence of technological change in interactive technologies has been a historical accident, driven by curiosity, the market, luck, politics – never by the needs of learners. Learning technologies have been developing haphazardly, and a little too rapidly for those of us who wish to turn them to advantage in learning. This becomes apparent if we compare these technological developments with the historical development of other key technologies for education.

Table 1 shows some of the main developments in information, communication, and delivery technologies over the last three decades, and against each one proposes a functional equivalent from the historic media and delivery technologies. The story begins with interactive computers because the move away from batch processing brought computing to non-programmers. The user had access to a new medium which responded immediately to the information they put in. As a medium for information processing, it was radically different from the much more attenuated relationship between reading and writing, thus creating a new kind of medium for engaging with ideas.

Technological change can affect the learning experience in profound ways, but the direction

of change depends more on the historical accident of the chronological sequence of technological invention, and the drivers of business needs and opportunities. The interactive computer offers the potential for a new kind of personal capability as powerful as the change wrought on human understanding by the advent of writing. It could transform the learning experience in much more exciting ways than simply providing access to information and written communications (Laurillard, 2004:10).

CONCLUSION

E-learning is a large and growing market with great potential in higher education. In order to maximize this potential, e-learning implementations should endeavor to satisfy the needs and concerns of all stakeholder groups as much as possible. The stakeholders' analysis undertaken is a step in that direction. Each stakeholder group has an important role to play while working together towards the common goal of enhancing the overall learning experience.

Students and instructors should participate as proactively as possible, provide feedback to improve future experiences, and communicate the learning possibilities that e-learning creates. Institutions should provide the technical infrastructure and support needed to enable comprehensive solutions. Content and technology providers should provide high quality, interoperable solutions that consider learning principles. Accreditation bodies should provide and enforce clear guidelines for this new form of learning delivery.

The development of new information technologies in the 21st century is expanding the range of information resources; it is also creating conditions for the formation of a global informational, educational and cultural space; and therefore changes occur in the education system. The high results cannot be achieved in the learning and the educational process without integrating new information and communication technologies in the education system. The use of enormous integrated set of computer and internet tools and resources allows us to achieve more efficient and effective training.

The students are no longer passive consumers of the educational programs and services, but active participants in the educational process. Their skills and competencies to work effectively with digital technologies are prerequisite for successful and responsible solving and presentation of scientific problems and cases. The development of new technologies and the use of e-learning in teaching and learning are of great benefit for integrating digital technology into the educational environment can increase the efficiency and the quality of the education system.

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(Source: www.google.com, 9/10/2013)

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