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'Distance education' and 'e-learning': Not the same thing

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Abstract. This article examines the distinct differences between 'distance education' and 'e-learning' in higher education settings. Since the emergence of the new information and communication technologies (ICT), many have related to them as the new generation of distance education, and some have referred to their implementation in academia as challenging the very existence of campus-based universities. Many policy makers, scholars and practitioners in higher education use these two terms interchangeably as synonyms. But the fact is that distance education in most higher education systems is not delivered through the new electronic media, and *vice versa* – e-learning in most universities and colleges all over the world is not used for distance education purposes. 'Distance education' and 'e-learning' do overlap in some cases, but are by no means identical. The lack of distinction between 'e-learning' and 'distance education' accounts for much of the misunderstanding of the ICT roles in higher education, and for the wide gap between the rhetoric in the literature describing the future sweeping effects of the ICT on educational environments and their actual implementation. The article examines the erroneous assumptions on which many exaggerated predictions as to the future impact of the ICT were based upon, and it concludes with highlighting the future trends of 'distance education' and 'e-learning' in academia.

Keywords: distance education, distance teaching universities, e-learning, higher education, information and communication technologies

Introduction

Higher education systems all over the world are challenged nowadays by the new information and communication technologies (ICT). These technologies have had a huge impact on the world economy, corporate management and globalization trends, and they bear a tremendous potential to reshape the nature of study environments everywhere, of both conventional and distance teaching institutions. Many have related to the ICT as the new generation of distance education (Bates 1999, 2001; Garrison 1993, 1999; Niper 1989; Peters 2001). Already in 1989 Soren Niper (1989) in his classic analysis identified three generations of distance education: the first was correspondence teaching; the second was multi-media teaching – integrating the use of print with broadcast

media, cassettes and to some degree computers; and the third generation was identified with the new interactive communication technologies.

Many policy makers, scholars and practitioners in higher education use the terms 'distance education' and 'e-learning' interchangeably as synonyms, emphasizing the continuous blurring of boundaries between conventional and distance education (AFT 2000, 2001; Arnold 1999; Evans and Nation 2000; Ryan 2002; Selinger and Pearson 1999; Twigg 2001). A comprehensive report issued by *The Pew Learning and Technology Program* in the USA stated clearly that: "The terms 'distance learning', 'distance education', 'distributed learning' and 'online learning' are used more or less interchangeably" (Twigg 2001, p. 4). It is important to mention that the various forms of learning through ICT are defined in the relevant literature by at least a dozen different terms, such as web-based learning, computer-mediated communication, telematics environments, e-learning, virtual classrooms, online instruction, I-Campus, electronic communication, cyberspace learning environments, computer-driven interactive communication, distributed learning, borderless education. In this article, all forms of learning/teaching through ICT are referred to as 'e-learning'.

Some scholars even go to extremes and claim that the new technologies challenge the very existence of campus-based universities. Arnold (1999), for instance, argued that the new information technologies create the appropriate scientific learning environments in the knowledge society, and given this 'it is an extremely small step that distance studies will take the place of face-to-face studies in the future' (ibid, p. 2). In the preface of the book *Virtual University – Educational Environments of the Future*, which provides an overview of the ICT implementation in European universities, Henk van de Molen stated that: "In the network society it is inescapable that the universities will have to deal with the information and communication technologies (ICT), not only for research but also for education. Some even think that universities as educational institutions will become totally virtual..." (van der Molen 2001, p. vii).

However, distance education in most higher education systems is not delivered through the new electronic media, and *vice versa*: e-learning in most universities and colleges all over the world is not used for distance education purposes (Bates 2001; Collis and Moonen 2001; Guri-Rosenblit 2001a, b, 2002; Harley et al. 2002; Somekh and Davis 1997; van der Wende 2002). 'Distance education' and 'e-learning' do overlap in some cases, but are by no means identical. According to a recent survey in the USA, for example, more than 85% of the students in post secondary institutions use various forms of e-learning, but only 7.6% of

undergraduate students take some distance teaching courses, and only 2.2% of them study their whole degree program through distance education (U.S. Department of Education 2002). The lack of a distinction between 'e-learning' and 'distance education' accounts for much of the misunderstanding of the ICT roles in higher education, and for the wide gap between the rhetoric in the literature describing the sweeping future effects of the ICT on educational environments and their actual implementation.

This article discusses the distinct differences between 'distance education' and 'e-learning' in higher education settings by comparing some of their major characteristics. It examines the reasons why most distance education on the university level all over the world is still provided through the more 'traditional' media of print and broadcasting, in spite of the many advantages e-learning provides for distance teaching purposes. The article analyzes the erroneous assumptions on which many exaggerated predictions as to the future impact of the ICT were based upon, and it concludes by highlighting future trends of 'distance education' and 'e-learning' in academia.

Distance education and e-learning at university level – three distinctive differences

Distance education at university level has existed since the early half of the nineteenth century (Bell and Tight 1993). The idea of a distance teaching university adopts the opposite course of a campus-based university. Instead of assembling students from dispersed locations in one place, it reaches out to students wherever they live or wish to study (Guri-Rosenblit 1999). E-learning, on the other hand, is a relatively new phenomenon and relates to the use of electronic media for a variety of learning purposes that range from add-on functions in conventional classrooms to full substitution for the face-to-face meetings by online encounters. Below three distinctive differences between 'distance education' and 'e-learning' are examined in relation to: remoteness and proximity between the learner and teacher in the study process; relevant target populations; and cost considerations.

On remoteness and proximity

'Distance education', by its very definition, denotes the physical separation of the learner from the instructor, at least at certain stages of the

learning process. This applies to distance education at all levels, from kindergarten to higher education. Holmberg, one of the leading researchers in the field of distance education, defined 'distance education' as characterized by non-contiguous communication, meaning that the learner and teacher are separated not only in space but also in time. According to Holmberg, the term 'distance education' covers "the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students at lecture rooms or on the same premises" (Holmberg 1989, p. 3). But contiguous education and pure distance education are extremes that rarely exist. Many distance education providers use face-to-face tutorials, summer schools and laboratory sessions, whereas many conventional universities utilize independent study and guided learning by tutors and a variety of media. The advent of the new interactive communication technologies enables synchronous communication between students and teachers and in-between students from a distance.

Daniel's (1990) interpretation of the term 'distance education' embraces all forms of instruction in which classroom sessions are not the primary means of education. Distance education is mostly homework, with occasional work in class; whereas conventional education is mostly classwork with occasional work at home. In conventional education the teachers teach; in distance education the institution teaches. Keegan (1986) defined the quasi-permanent separation of the teacher and the learner throughout the length of the learning process, as well as the quasi-permanent absence of a learning group throughout the length of the learning process, as two of the major characteristics of distance education. In other words, in 'distance education' students are usually taught as individuals, not in groups, and are separated physically from both the teacher and other fellow students. In some cases, groups of students are taught by a distant teacher, mainly in the framework of teleconferencing and other broadcasting media.

Although ICT facilitate the provision of distance education, and are also defined by many as 'distance learning technologies' (Arnold 1999; Garrison 1999; Garrison and Anderson 2000; Peters 2001), 'distance' is not a defining characteristic of e-learning. The applications of electronic media in distance teaching settings constitute only partial and limited functions, out of their overall capabilities. By their very nature, the new technologies are much more complex than the old distance teaching media, and they open up possibilities to design new study environments that were not feasible beforehand – for both on-campus and off-campus

students. The new ICT offer a rich plethora of uses in learning/teaching processes far beyond the ability to transfer content of textbooks and lectures to students at a distance. In fact, none of the ICT uses denotes the physical separation of the learner from the teacher at any stage of the study process. Many of the ICT qualities can be used most efficiently to enrich and support lectures, seminar meetings and face-to-face tutorials (Collis and Moonen 2001; Fetterman 1998; Guri-Rosenblit 2002; Harasim et al. 1995; Harley et al. 2002; Littleton and Light 1999; Robinson and Guernsey 1999; Scott et al. 2002; Somekh and Davis 1997; van der Wende 2002).

The new technologies are applied in a variety of domains for information retrieval from periodicals, books, newspapers and other information resources; simulations and multi-media presentations; communication with instructors in- and after-classes; communication amongst students; drilling exercises and sample tests; reading notice boards; class administration, etc. Furthermore, ICT have a huge impact on other important areas of university activities, such as: library management; registration and loan administration; enhancement of research communities; academic publishing; mobility and cooperation between institutions. The applications of the technologies in the above mentioned areas have nothing in common with the traditional roles of distance education.

In early 2000 the National Academies of the USA launched a study on the implications of the information technologies for the future of the nation's research universities (National Research Council 2002). The panel was composed of leaders drawn from industry, higher education and foundations with expertise in the areas of information technologies, the research university, and public policy. The members of the panel purported to examine the implications of the new technologies on the activities of teaching, research, service and outreach of the research university, as well as on its organization, management, and impact on the broader higher education enterprise. They concluded that the impact of the information technologies on the research university will likely be profound, rapid and discontinuous. The new technologies will not only influence the intellectual activities of the university (learning, teaching and research) but also change how the university is organized, financed, and governed. Nevertheless, they emphasized that the campus, as a geographically concentrated community of scholars and a center of culture, will continue to play a central role. In other words, the impact of the new technologies on the universities' operation and on the ways knowledge is generated and transformed will grow in the future, but

most of their applications will take place in the framework of campus-based universities and not in distance or virtual settings.

Target clienteles

A second distinctive characteristic of distance education is its attention to the needs of special clienteles that for a variety of reasons cannot attend a face-to-face gathering, a school or a conventional campus. Examples of intensive exchanges of letters for educational purposes have been known since ancient times. Such is the correspondence between Plato and Cicero and their students, and the famous letters sent by Apostle Paul to the early Christian communities. Since the nineteenth century correspondence institutions, extensions and distance teaching universities have opened the gates of academia to diverse clienteles for higher and continuing education. By doing so, the distance teaching institutions fulfilled an emancipatory ethos (Morrison 1992), a kind of barrier-removal mission. Time, space, prior level of education, social class, working and family obligations were defined as barriers to be overturned by special policies and mechanisms applied by distance education institutes.

The target populations studying through distance education at post-secondary level were considered as distinct and special, usually older than the age cohorts at classical universities, and mostly 'second chance' students according to a variety of criteria. Such was the case of Prof. Knight of St. Andrews University, the oldest Scottish university, who decided that women were also entitled to higher education. He offered between 1877 and 1931 an external higher education degree in arts specifically designed for women scattered in over one hundred centers world-wide (Bell and Tight 1993). Traditionally, distance education at university level purported to overcome barriers and difficulties of students that were unable to attend a conventional campus. The obstacles which distance education has enabled to overcome include lack of formal entry qualifications; physical/health constraints; geographical barriers; working; family obligations; being held in closed institutions, such as prisons and hospitals, etc.

Interestingly, even nowadays when millions of people use the Internet and exploit its distance learning capacities, the profile of the students studying all or most of their higher education programs through distance education methods still resembles the profile of the traditional distance student. In a comprehensive survey published by the U.S.

Department of Education in November 2002 on *A Profile of Participation in Distance Education 1999–2000*, it was clearly found that students who chose to take distance education programs were "those with family responsibilities and limited time. They were more likely to be enrolled in school part time and to be working full time while enrolled" (U.S. Department of Education 2002, pp. iii–iv). This survey was conducted on all undergraduate and graduate students enrolled in USA post-secondary institutions during the 1999/2000 academic year.

Unlike distance education, e-learning is used by all types of students on all educational levels, from kindergarten to doctoral studies. E-learning offers attractive uses for learners of all ages and of various interests and needs. Younger pupils enjoy its multi-media games and fun activities in acquiring very basic literacy skills; older students use its endless information resources for preparing homework, assignments and examinations; and millions of people use e-mail, chat groups and other formats of telecommunication as learners, and in their social and working lives. E-learning is by no way exclusively meant for distance learners. As argued earlier, it is used extensively by on-campus students in the framework of their activities in classes, seminars, laboratories and other academic assignments and projects.

Cost considerations

A third major characteristic of distance education at university level in recent decades has been its ability to broaden access to higher education by providing economies of scale. This has particularly become true since the 1970s, when a new brand of large scale distance teaching universities was established. The mega distance teaching universities followed the model of the British Open University founded in 1969. There are about 30 such universities in various parts of the world. All of these large scale universities were a product of governmental planning set to fulfill national missions, mainly – to absorb large numbers of students at a lower cost as compared to traditional campus universities (Daniel 1996). This goal has been achieved through an industrialist model of operation (Peters 1994, 2001).

The division of the academic teaching responsibility into two separate phases constitutes the essence of the industrial model of distance education. The first phase is devoted to the development of high quality self study materials by teams of experts. The production of such courses is most expensive, since they are developed by a small number of

academics and other professionals and they undergo stringent quality control mechanisms. Most of the course developers do not participate in the second phase of the actual learning/teaching process. The underlying assumption of this phase is that large numbers of students can study the pre-developed materials through the didactic apparatus integrated into the self study materials, and the assistance of lower ranks of faculty (such as tutors and teaching assistants); and as the number of students increases, the cost per student decreases. This simple formula constitutes one of the main raisons d'être of the mega distance teaching universities (Bates 1999; Curran 2001; Daniel 1996; Guri-Rosenblit 1999). The fact is that the well-articulated study materials of the new brand distance teaching universities have replaced ordinary textbooks and the low-level correspondence courses, and are used extensively not only by students in the distance teaching universities, but also by many students at conventional universities in different national settings. Hence, many distance teaching universities have gained additional revenues from operating as highly respected academic publishing houses.

It seems that the simple formula of the industrial model upon which the large scale distance teaching universities operate, accounts for part of the misconception as to the economies of scale that ICT were expected to provide. The blurring of meanings between 'distance education' and 'e-learning' led to expectations and predictions that through the new interactive media dozens of thousands of students would be able to join higher and continuing education programs at lower costs as compared to classroom teaching in campus universities. But the underlying premises of e-learning differ meaningfully from the industrial model of distance education, as will be elaborated further on. Quite frequently, effective e-learning costs more, not less, than conventional face-to-face teaching (Bates 2001; Guri-Rosenblit 2001b; Matkin 2002; Ryan 2002). The distinct differences between the industrial model of distance education and e-learning explain why most of the large scale distance teaching universities have so far incorporated the new ICT to a very limited extent, in spite of their apparent suitability to distance teaching.

Why is it difficult to implement e-learning in large distance teaching institutions?

The new technologies are most attractive for distance teaching. They have the potential to overcome three major problems of 'traditional'

distance education: to rescue the isolated students from their loneliness by providing interaction with teachers, professors and tutors, as well as with other peer students throughout the study process; to provide easy access to libraries and other information resources, which was nearly impossible in the past; and to update the self study materials on an ongoing basis. But, as aforementioned, the very basic infrastructure of most large distance teaching universities hinders the wide scale implementation of the ICT. 'Distance education' as provided by the large distance teaching universities and 'e-learning' are based on two different teaching/learning paradigms. While the industrial model of 'distance education' is based on teaching large numbers of students by a handful of professors, most of whom do not communicate with the students at all, efficient 'e-learning' encourages direct interaction between a small number of students and expert teacher/s. 'Distance education' is aimed at students who are located in dispersed places and are physically distant from their teachers and the teaching institution, whereas 'e-learning' can be easily utilized by both distant and on-campus students, and even more effectively by the latter. 'Distance education' at university level in the last thirty years has prided itself for providing economies of scale as compared to campus universities, while well designed 'e-learning' environments tend to cost even more than comparable face-to-face encounters. The advantages and problems which are associated with the ICT use for communication, information access and course update in the framework of distance teaching institutions are discussed below.

Communication – merits and problems

The lack of direct teacher–student and student–student communication has been the Achilles heel of distance education for centuries. The new interactive technologies enable universities to overcome this shortcoming. But intensive communication is, by its very nature, labor intensive. Phoenix University and the University of Maryland University College are two of the most successful USA universities that provide e-learning (Ryan 2002; Trow 1999; Twigg 2001). Their online classes are restricted from 8 to 15 students to guarantee high levels of interactivity. Phoenix University charges more for its online programs than for tutorials in study centers, since its operators found that the interactivity which students value is not scaleable at marginal costs. It turns out that

students who study online are willing to pay the additional costs for increased interactivity, but, to this date, the majority of Phoenix University's students prefer to meet in face-to-face tutorials.

Thus, in theory, enhanced communication in distance education is enabled by the ICT, but its actualization is much more complicated to achieve. Small numbers of faculty are unable to communicate with thousands or even with hundreds of students. Moreover, direct interaction between students and the faculty members who developed the self study courses necessitates the involvement of the latter in the actual learning/teaching process. In other words, it requires the abolishment of the very basic characteristic of the industrial model of distance education. Most, if not all, large distance teaching universities, cannot afford to hire many more academics in order to facilitate student–professor interaction in most of their large courses, often taken by thousands of students. Interaction among students and between students and tutors and lower ranks of academic staff has been enhanced in most distance teaching universities, but the synchronous communication between the senior faculty who are responsible for the overall structure and content of any self study course and the students is either extremely limited or non-existent.

It is no surprise therefore that distance education in most higher education systems is still conducted through the 'old' technologies: mainly print, but also through radio, TV and satellite broadcasts. The USA is the exception – most of the distance education in the USA is delivered through e-learning (Bradburn 2002; Gladieux and Swail 1999; U.S.A. Department of Education 2002), but not *vice versa*. Most of e-learning in American higher education is not used for distance teaching purposes (Guri-Rosenblit 2001b; Harasim et al. 1995; van der Wende 2002). Developing countries, in particular, do not possess the appropriate resources and technology infrastructure to make e-learning available on a wide scale. Bates, who was asked by the *International Institute for Educational Planning* of UNESCO to recommend national strategies for implementing e-learning in post-secondary education in various parts of the world, concluded that: "Those countries that are not yet ready for the knowledge-based economy are probably not yet ready for e-learning" (Bates 2001, p. 111), and he suggested that those countries with large numbers of students unable to access the final years of secondary or higher education should adopt the industrial model of the distance teaching universities, that provides the best route for mass education, rather than design e-learning frameworks.

Information access – on equality and duplication

Access to libraries and other information resources through the Internet has been used in the last decade at an accelerated pace by members of both distance and campus universities. More and more libraries are becoming digitalized and going online. But also in this domain of information access, the mega distance teaching universities encounter more difficulties as compared to campus universities. Many of their students, particularly in developing countries, do not have ready access to computers (Bates 2001; Guri-Rosenblit 2001b). The egalitarian philosophy of most distance teaching universities, that requires that they provide equality of opportunity to all of their students, also forces them to continue developing their printed self contained study packages that can be delivered to each student by mail. In other words, catering to large numbers of students, many of whom lack the ability or opportunity to reach Internet facilities and information resources, hinders the distance teaching universities from substituting some of their courses, or parts of any given course, with online materials, and with a built-in reference mechanism in the pre-prepared textbooks. This accounts for the duplication phenomenon. Many distance education institutes develop currently both printed and online versions of courses, and enable their students to choose their preferred mode of study. Such a policy adds on substantial additional costs to the already very expensive process of developing self study materials.

Update of study materials – potential and difficulties

One of the major problems associated with the development of expensive high quality materials for distance education is the difficulty in updating them. It is tremendously difficult to amend, change and revise materials produced over several years and used in a standardized manner over many years (Daniel 1996; Guri-Rosenblit 1999). Unquestionably, the new technologies and the availability of desktop publishing provide a partial remedy by substantially reducing the time of course production and making the updating of materials less fraught. But in order to be able to update the materials on an ongoing basis, the course developers have to be part of the actual learning/teaching process. Here again the ICT challenge the organizational infrastructure of the distance teaching universities and demand a major overhaul of their whole operation (Bates 1999, 2001; Guri-Rosenblit 2001b; Peters 2001).

In campus universities the individual lecturer or tutor in any classroom may alter and redefine reading lists, and set assignments and study tasks in light of the teaching dynamic. However, teaching faculty at most distance teaching universities do not have any latitude whatsoever to make such alterations. The principles of sameness and uniformity apply to assignments and exams as they do to content. In order to employ flexible updating mechanisms, the distance teaching universities have to redefine and restructure their overall teaching mechanisms. The teaching responsibility in most distance teaching universities is distributed among many actors, and exempts most of the senior academic faculty from involvement in the actual study phase. As difficult as the updating task seems to be, the distance teaching universities will have to undertake it, incurring also the additional associated costs of such a process.

To sum up this section, it seems that in spite of the apparent advantages and merits of the new ICT for distance education, many of the distance teaching institutions lack the appropriate infrastructure and necessary conditions, as well as the human capital, to utilize the full potential of the ICT. To integrate the electronic media more fully and efficiently into their learning/teaching processes a whole restructuring of their operation is required, and such a process will take time and will necessitate totally new agreements between the large scale distance teaching universities and the national governments that sponsor them.

Some erroneous assumptions as to e-learning applications

A few years ago, many economic analysts, policy makers and practitioners projected that dramatic changes would take place in the academic world and in professional training from the new technology push and the emergence of the new information economy. Several years on, the euphoria surrounding high technology industries and their sweeping effects on training markets and higher education has subsided. A large scale comparative study on the applications of ICT in 174 higher education institutions in the Netherlands, Germany, the UK, the USA, Australia, Norway and Finland (Collis and van der Wende 2002) was presented in an international conference on 'The New Educational Benefits of ICT in Higher Education', that took place in Rotterdam in September 2002. The final conclusions of this study were: "Change in relation to the use of ICT has been gradual and unsystematic. Many experiments and pilot projects have been launched leading to interesting

innovations, which are, however, generally not well disseminated. ICT is used mainly to increase flexibility in on-campus delivery of education. Institutions turned out to be only moderately focused on new target groups, such as lifelong learners and international students. Competition from foreign or corporate providers does not seem to be a major driving force for institutional ICT policy" (CHEPS 2002, p. 2).

There are very good reasons for the piecemeal adaptation of the ICT in higher education settings. Most of the predictions as to the sweeping effects of the ICT on higher education have been based on several erroneous assumptions which are examined below.

Space and time as barriers to overcome

One of the erroneous assumptions as to the fast spread of e-learning was based on the notion that the need to attend a physical campus at given times is perceived as a barrier to overcome by most students. This perception is echoed in many publications. In a recent report issued by USA National Academies of Science, for example, it was stated that the new technologies "will erode, and in some cases obliterate, higher education's usual constraints of space and time" (National Research Council 2002, p. 2). But the fact is that most students, and particularly those of traditional college age, enjoy attending the physical campus and meeting their peers in the framework of classrooms, lecture halls and seminar rooms for reasons that go far beyond the acquisition of knowledge and skills.

The need of humans to socialize is essential, not only in higher education. Alvin Toffler (1980) coined in his famous book on the *Third Wave* the term "electronic cottage". He predicted a return to the cottage industry on a new, higher, electronic basis, and a new emphasis on the home as the center of society. In reality his predictions have not materialized. Some business firms decentralized their work, and a handful of professionals like to work at home, but still most people prefer to work outside their homes, because of their immense need for social interaction. This social need applies to higher education settings as well.

Many studies in the last decade show clearly that most students prefer to attend classes even when provided with the opportunity to get video-taped lectures, exercises and intimate tutoring through the electronic media. For instance, a large scale study was conducted at UC Berkeley from September 2000 to June 2002 on the use of technology

enhancement in some large undergraduate courses in chemistry (Harley et al. 2002). This study found that only 16% of the students would be willing to watch lecture webcasts entirely online instead of going to the lecture hall. 84% of the students indicated that they prefer to attend face-to-face encounters, even though they could have studied all the materials, conducted all of the experiments and watched the video-taped lectures at home.

A wide national project in Israel to enhance the use of the ICT in Israeli universities through special funding and incentives provided by the Israeli Council for Higher Education, was joined by many academics. A study showed that at Tel-Aviv University more than 1000 faculty members have utilized various forms of e-learning in their classes in the last 3 years, but only 1% of them used electronic media to substitute for class encounters (Guri-Rosenblit 2002). Many more studies substantiate this trend (CHEPS 2002; Collis and van der Wende 2002; Collis and Moonen 2001; Curran 2001; Fetterman 1998; Somekh and Davis 1997; van der Molen 2001; van der Wende 2002).

Not only students in campus universities, but also students in distance teaching institutions express a high demand for personal interaction with academics and other students. One of the main lessons from the running of distance teaching universities underlines the importance of the social interaction. Contrary to some initial theories which assumed that adult students choosing to study via distance methods prefer to learn on their own and to interact only from time to time with academic staff, the experience of the large distance teaching universities shows that many prefer frequent contact, both with academic faculty and fellow students (Guri-Rosenblit 1999). In some places, where distance does not present a real physical obstacle, like in Israel, more than 80% of the distant students urged the Israeli Open University to provide weekly meetings with their tutors in study centers.

At the University of Phoenix, a subsidiary of the giant Apollo Group, the largest accredited private distance teaching university in the USA that has operated since 1976, only about 10% of its student population are registered for online programs (Ryan 2002). The University of Phoenix appears to have no intention of downscaling its physical learning centers in favour of online provision. On the contrary, a "bricks and clicks" model, offering both an online and distributed face-to-face option is regarded as the best solution for the working adult market.

Even in the business world, many prefer hybrid courses. There is apparent resistance by many students to the notion of exclusively online

education. One demographic group targeted by many universities is the busy professional, unwilling to commit to weekly classes and highly mobile in work patterns. Specifically for this group, a hybrid model has emerged, combining online communication/resources supporting intensive residential periods on campus to engender group cohesion and social learning. A recent European study found that only 15% of companies using e-learning preferred a stand-alone approach, with the majority opting for greater online interaction and use of e-learning to prepare for and reinforce face-to-face provision (Ryan 2002).

In other words, space and time constitute barriers for those students that because a variety of constraints cannot attend a campus or a residential school at specific times. These are the students who have traditionally been attracted to distance education, and their numbers will grow in the future, as will be discussed below. But space and time do not constitute a universal problem for most students, particularly for the traditional age cohorts that attend school and university.

The urge of universities to extend their student population

A second erroneous assumption regarding the impact of the new electronic media on the academic world was based on the notion that most universities have an urge to expand their boundaries and to extend their student clienteles, if only possible. The fact is that most campus universities have no good reason to increase their student body and to utilize distance teaching methods. The elite research universities, in particular, are, by their very nature, less interested in widening access to large numbers of students. They are inclined to remain selective for the few and well-to-do students. MIT is a leading institution in ICT applications. It currently runs nearly forty projects related to various uses of the new technologies (Olsen 2002). Nevertheless, its president, Charles Vest, stated firmly in his 2000/01 annual report that: "The residential university will remain an essential element of our society, providing the most intense, advanced, and effective education. Machines cannot replace the magic that occurs when bright, creative young people live and learn together in the company of highly dedicated faculty" (Vest 2001). MIT is currently developing its Open Courseware project for 'academic philanthropy' purposes, but not for its own students. The Open Courseware project will give interested students and faculty members all over the world a glimpse of the MIT curricula of about 2000 courses. But by no means does MIT intend to enroll large

numbers of students, or offer online courses from MIT professors for credit (Olsen 2002).

In an international comparative study on the applications of ICT in 174 institutions in seven different countries, that was aforementioned, it was found that most universities do not reach out to new student clienteles either in their national settings or in the international domain (Collis and van der Wende 2002). Part of the reason is that it is a complicated and demanding task to design study programs for distant students by academics that have been accustomed to teach on-campus students. The teaching faculty are required to comprehend the unique qualities of various media for shaping new learning environments that are more learner-centered and enhance dialogue with students situated afar. For promoting such programs there is a need to develop a new infrastructure for course design and student support services. The full-fledged distance teaching universities have invested a huge amount of energy, money and human efforts for establishing special mechanisms suited for teaching at a distance. Most campus universities are relatively novices in the field of distance education, and are not appropriately equipped when confronted with distance learning concerns.

In spite of the apparent difficulties to operate distance teaching by campus universities, a growing number of universities use the ICT to export a variety of programs as a commodity for profit. Many new consortia have been founded in the last decade, most noticeably by Australian, Canadian and British universities that export professional and academic programs for international students located mainly in third world countries. These consortia purport to generate more funds for the ongoing operation of the participating universities (Ryan 2002; van der Wende 2002). Most of the exported programs are aimed at graduate and postgraduate students, and have greatest success in professional training. But the majority of the new student populations are not considered an integral part of the main student body of these universities.

Harvard, Dartmouth, John Hopkins and Brown universities in the USA, have been investing in recent years in for-profit college companies (Blumenstyk 2003). The programs that the for-profit companies offer have nothing in common with the traditional core curricula of these elite research universities. Harvard University, for example, is the biggest institutional investor in a $590 million fund run by Boston's Charlesbank Capital partners, which made its foray into the sector in April 2002 by investing in a school that trains automobile and motorcycle technicians (ibid) – not exactly typical Harvard students. In other

words, most of the well-based campus universities are in no rush to significantly expand their student body. Their reaching out to additional student clienteles is mainly conducted for profit, and mostly in professional training areas.

Lack of clear problems as a problem

A third erroneous perception regarding the impact of the new technologies on higher education was based on the hidden assumption that the advantages of the ICT are self evident, and there is no need to define them. In other words, the merits of the new technologies are so great, that they will be adopted easily and eagerly by policy makers and practitioners in the academic world without any need to define a clear vision of problems they might solve or what parameters in higher education they could improve. The new electronic media were introduced into the academic world like a sudden thunderstorm without taking the time to define what purposes and functions they could fulfill or substitute for. The lack of clear problems turned out to be an acute problem in the adaptation process of the new technologies in universities and colleges.

The old and traditional distance education media were defined by very clear parameters. Their main goal was to deliver study content to students that, for a variety of reasons, were unable to attend a face-to-face classroom. Print, radio and television have clear-cut and transparent characteristics. It is totally clear what the self study materials and the communication channels stand for, and what kind of functions in the learning/teaching process they replace. This is not the case with the new technologies.

Unlike the clear obstacles and barriers which traditional distance teaching technologies were designed to overcome, the new technologies offered multiple uses with no clear relation to any existent or future problem in the teaching/learning processes in campus universities. The reactions of many academics asked to incorporate the new technologies into their classrooms have been of the type: "If it ain't broke, why fix it?' or "Technology is the answer – but what are the questions?" (Guri-Rosenblit 2002).

The UC Berkeley study, mentioned earlier, constitutes an interesting example of the impact of problem definition on institutional decision making (Harley et al. 2002). In the process of conducting the study, it was found that technology-enhanced classes in chemistry can save both faculty time and space. Instructors spent less time answering routine

questions because students were able to find some of the necessary information online. And it was found that laboratory sessions could hypothetically be reduced from four hours to three to better utilize lab space. Such a finding has been most interesting for the UC policy makers is face of Tidal Wave II, namely the fact that the University of California ten-campus system is facing an increased enrollment of about 63,000 full-time students, a 43% increase in the coming years. If through the use of technology it is possible to save from 10% to 20% of space and faculty time, technology becomes a strategic solution to absorb more students, although it does not save money (ibid).

Many studies in the field of the ICT implementation claim that the time has come for both governments and institutions to become more focused and strategic in their policies regarding the use of the ICT (Bates 1999, 2001; CHEPS 2002; Collis and van der Wende 2002; Guri-Rosenblit 2001b, 2002; Harley et al. 2002; Laurillard 2001; Matkin 2002; National Research Council 2002; Trow 1999; van der Molen 2001; van der Wende 2002). A macro level organizational effort is needed to consolidate the multiple findings of the ICT uses into a coherent body of knowledge, available to decision makers in higher education settings. Laurillard (2001) in her widely acclaimed book on 'Rethinking University Teaching' emphasizes the pressing need of higher education institutions, both campus-based and distance education providers, to meet the demands of the knowledge society by taking full advantage of the rich possibilities the new technologies present to move teaching and learning into a new era. For making the learning/teaching processes interactive, reflective, adaptive, and discursive, high rank policy makers play a crucial role as resource allocators and as system designers.

E-learning as a profit making activity

A fourth erroneous assumption regarding the ICT implementation in higher education was based on its fast profit making capabilities. A few years ago many analysts, such as Morgan Keegan (2000), projected billion dollar e-education and e-training markets globally. Virtual networks of colleges and universities became a marker of a new economy. Several years later costly experience has caused many higher education institutions to question the increasing costs of their commitments to digitization and wired campus programs (Matkin 2002; Ryan 2002).

It seems that three major reasons account for this misconception regarding the fast and easy profit from e-learning. First, as explained

earlier, the economies of scale provided by the large distance teaching universities, operating on the basis of the industrial model, led many to believe that any distance teaching technology is by its very nature cost effective. Second, substantial cuts in training costs that took place in the corporate world as a result of cutting out flights and hotel expenses on training caused many to assume that such money saving will also occur at universities employing e-learning. Obviously, it is more economical to bring training programs to the work place rather than sponsor the sending of workers for days to remote conference sites and training sessions. It is no wonder then that most of the profit-making claims came from the business and corporate world. But cuts in hotel and flight expenses have no relevance at all for students and faculty in the academic world. Third, the high expenses of setting up an appropriate infrastructure for e-learning, its ongoing maintenance, and its wastage management, were heavily downscaled.

Setting up an appropriate infrastructure for the effective utilization of the ICT in any university or college requires large investments. The computer hardware is still quite expensive, and its rapid change and the need for its frequent replacement increase the expense entailed. The initial costs of the basic infrastructure needed for operating e-learning is by no means a trivial issue. Bates stressed in his report on 'National Strategies for E-learning in Post-secondary Education and Training' that: "E-learning is heavily dependent on appropriate technological infrastructure already being in place for commerce or government reasons. Stable electricity and reliable and moderately priced Internet access is a necessary condition for e-learning" (Bates 2001, p.113). Until there is a basic and reliable infrastructure in place, e-learning is unlikely to be a realistic or practical choice for learners.

Not only the infrastructure, but also the maintenance of e-learning is costly. It is of tremendous importance to establish support systems for both students and teachers who use the ICT. The induction of the teaching faculty into the new technologies necessitates ongoing professional and technical support and the establishment of special centers for course development (Bates 1999, 2001). Ongoing support is also needed for students, particularly weak students (Collis and Moonen 2001; Guri-Rosenblit 1999; Littleton and Light 1999; Scott et al. 2002; Somekh and Davis 1997).

Sir John Daniel who served until 2001 as the Vice-Chancellor of the UK Open University already stressed in 1996 that the potential success of the innovative electronic technologies depends to a great extent on the ability to provide individual learners with adequate backup

throughout their studies. Daniel asked: "Can we through electronic mail, computer conferencing and the World Wide Web, provide the level of individual student support that we think necessary? We are experimenting with that, but despite all the arm waving, I think the jury is still out. If the jury comes back and declares us guilty of being able to provide effective, personal, tutorial support to students on a large scale, then all sorts of things become possible" (Daniel 1996, p. 38). It seems that since Daniel phrased this question, the jury has brought in its verdict – such support is possible when teaching online very small numbers of students, and such a mode of teaching is extremely costly.

In addition to the high expenses associated with setting up an appropriate infrastructure for e-learning and keeping up its maintenance, the wastage of the outdated hardware turns to be an unexpected additional cost. Getting rid of outdated computers poses financial, environmental and ethical challenges (Carlson 2003). Last year the University of Minnesota, for instance, spent more than $100,000 for the demanufacturing of old computers – to pull out valuable steel, aluminium, copper and the chips that contain gold, and to get rid, in an appropriate way, of the many poisons it contains. During the boom of technology in education, colleges bought computers by the truckload. Now the institutions have to be careful when they throw those aging computers away. In some USA states, such as California, New Jersey, Massachusetts, Oregon, Virginia and South Carolina, legislators have proposed or passed laws that ban the disposal of electronic waste and outline how to treat large quantities of hazardous materials which include computer monitors, televisions and other electronics. Electronic waste is now regarded as the next big environmental issue. Old computers compose 10% of the solid-waste stream in the USA, but computer related waste is growing as three times as fast as any other kind. The number of computers retired in 2002 was 40 million, and the number of obsolete computers is believed to be nearly 300 million in 2004 (ibid). Many universities and colleges have not yet decided how to deal with their electronic waste and how to sponsor this activity. In sum, it is definitely not easy to turn e-learning into a profit making activity.

On the future of 'distance education' and 'e-learning' in higher education – concluding remarks

This article examined the distinct differences between 'distance education' and 'e-learning' in higher education, and clarified the erroneous

assumptions on which many exaggerated predictions as to the sweeping effects of the new electronic media were based. Though it is likely that in the upcoming decade more and more providers of distance education will incorporate various forms of e-learning in their learning/teaching apparatus, still the differences between 'distance education' and 'e-learning' will remain noticeable. The boundaries between 'distance education' and 'e-learning' will blur in some areas, but they will never totally merge. Both phenomena will grow in the future, but mostly for different reasons and in different directions.

How will distance education at university level evolve in the future?

Distance education at university level will grow in the coming years and will attract new student clienteles. It will be provided more and more by mixed-mode institutions and consortia in addition to stand-alone distance teaching institutions; and its mode of operation will depend greatly on the technological infrastructure of various national settings.

Initially, most distance teaching institutions were mainly designed for older part-time students. Throughout the last two decades more diverse student clientless have joined distance study frameworks, and it is likely that the future student cohorts, both in distance and campus-based universities will be more heterogeneous. More younger students will join distance education. The desire of many high school students to gain academic credits concurrently with their high school studies, as well as their attraction to highly demanded fields of study, to which admission is difficult at a conventional university, haven drawn, and will continue to draw, young students to highly acclaimed and reputable distance education providers.

In the future distance education is likely to attract several new adult student constituencies. Today, lifelong learning has become the leitmotif and dominant slogan of most higher education institutions worldwide. Grosso modo, lifelong learning is based on part-time education proceeding throughout the whole life cycle. Part-time students are typically adults in full or partial employment and/or having family and social commitments. Among the older students at least three distinct groups can be identified: second-chance students; professional workers; and adults seeking to broaden their education in order to become better acquainted with new fields of knowledge. The proportion of students joining distance education for professional upgrade and for recreational purposes will grow immensely in the future.

A large proportion of students in any higher education institution, but particularly in distance teaching programs, will be studying towards various diplomas and continuing education courses, rather than towards full degree programs. International students, composed mainly of young professionals working in international corporations, will be a growing component in distance education institutions. Being highly mobile they will expect to continue studying as they move within or between different national jurisdictions.

The status of the mega distance teaching universities will remain stable, and their main mandate will continue to be to widen access to higher education by reaching out to students who cannot attend or gain access to conventional universities. They will continue to operate on the industrial model paradigm which produces economies of scale and enables them to enroll large numbers of students at relatively low marginal costs well below those of campus universities or e-learning providers. Print and mass media will continue to serve as the main media in these large distance teaching institutions, though part of their courses will be enhanced by e-learning components.

New leading models of distance education will be provided by mixed-mode institutions and consortia-type ventures. The mixed-mode enables students to study concurrently on-campus and through distance education. Consortia type ventures, in which a number of universities join forces, either within national higher education systems or as an international enterprise, will offer a rich variety of distance teaching programs. Some of the consortia have been created, and will continue to operate, as partnerships between universities and the corporate world. Many of the mixed-mode institutions and consortia offering distance teaching courses will utilize the communication capabilities of the new interactive media.

The technological divide between developing and developed countries will be clearly reflected in the mode of distance education delivery. Most developing countries do not possess the resources and skilled workforce necessary to make e-learning feasible and available on a wide scale. Bates (2001) claimed that only a handful of developing countries will be able to move partially into e-learning through a growing indigenous high-tech sector, a rapidly developing middle class and export of academic programs from developing countries. However, in developed countries as well, the new electronic media applications will be used in the large distance teaching universities mainly as add-ons to the core curricula that will continue to be based, by and large, on printed self study materials and mass media. Nevertheless, the production of the self

study courses and their ongoing update will undergo drastic changes. Communication among students and between students and tutors in the study process will be greatly enhanced by the new electronic media.

How will e-learning at university level evolve in the future?

The impact of the new technologies on higher education environments will grow dramatically in the future, and will affect all domains of academic activity – research, teaching and learning, organization, finance and government policy. Unquestionably, the new technologies have the potential to provide new exciting possibilities to improve the quality of the study process, and affect the generation and delivery of knowledge both in campus and distance teaching universities. However, the provision of distance education will constitute a partial function of e-learning applications, while the campus will remain a center of university culture, knowledge generation, and the locus of students–faculty interaction. The new technologies are not likely to endanger the existence of the campus universities, but rather enrich, support and enhance many of their activities.

E-learning will greatly contribute to growing flexibility in academic study patterns (Bates 2001; Collis and Moonen 2001; Collis and van der Wende 2002). Flexible learning offers students many opportunities to adjust their interests, needs and learning styles to a variety of learning settings and media combinations. Hybrid courses, combining various components of face-to-face encounters with online provision will emerge as a growing pattern in academic institutions. However, online teaching as a stand-alone pedagogy will be used to a very limited extent, and most e-learning will be employed for add-on functions in teaching/learning processes. The majority of students attending campus universities will prefer to attend classes, or will choose to distribute their college experience among residential campuses, commuter colleges and online courses. More graduate or postgraduate students will study online, whereas the majority of undergraduates will prefer the more conventional face-to-face encounters.

E-learning will promote the growth of both academic trade and academic philanthropy. More universities and new for-profit companies will export academic and professional programs as a commodity to a variety of student populations. There are already some noticeable differences among national policies in this domain. Australia, the UK and Canada are more oriented to the international market (Ryan 2001). Many of their

universities try to export their higher education as a commodity to third world countries. American universities are more directed inwards, generally preferring campus-based integration of ICT, with a few examples of purchases and partnerships in physical campuses overseas.

Concurrently with the growing use of e-learning for profit and commercial purposes, academic philanthropy through the utilization of the ICT capabilities will grow as well. The MIT's Open Courseware project constitutes an excellent example in this domain. It demonstrates how a leading private university can practice intellectual philanthropy in the world of academic teaching. Higher education institutions all over the world will be able to adapt content and ideas from the MIT courses for their benefit. Also Carnegie Mellon and Princeton universities are currently involved in experiments to make course materials public on the Web (Olsen 2002). The Open Knowledge Initiative constitutes an additional example of academic generosity. This is a collaborative effort led by MIT, Stanford University with six other institutions of developing free and open technical specifications of learning management systems and related infrastructures (ibid).

E-learning will unquestionably enhance globalization trends. 'Internationalization' and 'globalization' are new buzz words in higher education and practice. These two terms draw attention to the undeniable fact that boundaries of what were relatively closed national systems are increasingly being challenged by common international trends (Enders and Fulton 2002). Universities are at present engaged in becoming partners in inter-institutional schemes and pushing forward in the drive towards globalization. Students, academic staff and curricula are transferred and exchanged between institutions; accreditation agencies ensure promptness in accrediting previous experiential learning and previous academic studies; governments append their signatures to cooperative projects in higher education. Strengthening agreements between academic institutions within a particular country and across national borders will be central to the mobility of adult students.

E-learning exerts global outreach. In an international market, students are able, and will be more so in the future, to approach any university where access policy encourages and extends to international students. This will be particularly true in professional training and postgraduate fields. The outreach of universities to international student clienteles on a global level could be activated at different levels, ranging from enrolling individual students from different countries, through collaborative ventures with other institutions (universities or business enterprises), to cooperative undertakings with governments, interna-

tional corporations and intergovernmental organizations. The involvement of such central bodies is essential for the systematic implementation of the new technologies into higher education systems efficiently and on a large scale.

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