Universidade do Porto

Faculdade de Engenharia

FEUP

Challenges for Higher Education in the Information Society

Sérgio Sobral Nunes

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Abstract

In this essay we are going to reflect about the future and challenges to higher education in the context of the information society. We will present both utopian and dystopian views about the future and conclude with a personal perspective.

In the first section we introduce several questions that arise when we think about the changes that we are currently experiencing in this information revolution.

In section two we present a brief overview of the main points defended by those who have a utopian vision confronted with dystopian ones.

In the following six sections we analyze the situation focusing on different aspects, namely: technological, spatial, cultural, occupational, political and economical. In each one we try to present both visions of the future.

Finally, in the last section, our perspective about the challenges for higher education is presented.

Introduction

Our society is currently evolving and changing in a profound way. Digital technologies, the Internet and the personal computer are fostering these changes. We are now in the process of becoming what is referred to as the Information Society. A society where information and knowledge are the most important values.

In the end of 2001, nearly half a billion people around the world had access to the Internet from their homes. (Reuters, 2002)

These changes have a great impact on every aspect of our society. From the way we conduct business and communicate with each other to the way we learn and stay informed. The volume of information produced has been increasing exponentially. Wurman (1989) writes, "a weekday edition of *The New York Times* contains more information than the average person was likely to come across in a lifetime in seventeenth-century England".

According to Noam (1995), in most branches of science, there is an annual growth of about 4 to 8%, with a doubling period of 10 to 15 years. "For example, more articles have been published on Chemical Abstracts in the past 2 years than throughout history before 1900", he states. Tapscott (1998) goes further by saying that "the knowledge base of humanity is now doubling annually".

> *With so much information being produced and accessible to all, what will be the teacher's role?*

Thus, it's obvious that the traditional role of the university is going to change in the future. With these growth rates, universities can no longer aim to be a repository of specialized information. Also, according to Noam, "universities are gradually shifting from investment in the physical presence of information to the creation of electronic access". Tapscott (1998) says "with what you learn at the university you are not even settled for the next 10 years. Mainly the technological areas".

> *With the constant renovation of knowledge, what's the meaning (and need) of an higher degree?*

Historically, the field of education has been oriented toward a model called broadcast learning (Tapscott, 1998). The teacher works as an aggregator of knowledge in some specific subject and learning is focused on instruction. In the near future, with the constant renovation of information and the increasingly scope of the subjects, this scenario no longer seems feasible.

As Tapscott states, "In this new economy, wealth is increasingly created by knowledge work – brain rather then brawn". In the new society knowledge workers will be the majority of the work force. Already, almost 60% of American workers are knowledge workers and 80% of the new jobs are in information-intensive sectors of the economy (Tapscott, 1998).

Critical thinking, mastering of communication and collaborative skills among others will be the most decisive factors to the future workers.

> *What kind of education will equip the current generation (future knowledge workers) for these tasks?*

Companies will need to maintain their workers constantly updated, thus giving them specialized training or education along their lives.

Will universities adapt to this situation or will commercial companies become the universities of the future?

As we can see, there are numerous challenges and questions that arise when we think, in the context of this information revolution, about the future of education.

Utopian and Dystopian Views

In this section we make a brief introduction to the concept of utopian versus dystopian viewpoints.

Utopian ideas are, in this context, optimistic and positive about the benefits of the information society to the future of education. The main idea is that this revolution will allow everybody to have an easier and cheaper access to knowledge, thus reducing the gap between the rich and the poorer.

The Internet is seen as, according to Gates (2000), "the most incredible learning tool ever created".

Their vision is of a world were education is accessible to all and universities work as 'knowledge servers'. Each university will be specialized in a specific area and services will be exchanged in a global way.

Dystopian, sometimes called apocalyptic, ideas represent the opposite view. Those authors who share these ideas have a more skeptic and reserved view about the future of education.

As Postman (1998) warns, "there are always winners and losers in technological change" and we must pay close attention to the hidden agendas of those enthusiastic about the new 'Age of Information'. He alerts that "for every advantage a new technology offers, there is always a corresponding disadvantage".

Critics, as Postman (1998), say that new technologies tend to strengthen the existent disparities in education. Giddens (1998) states that, a new form of poverty ("infopoors") may arise and be added to the existent list of privations (e.g.: school materials, medical care, proper nutrition), that have great impact on the process of learning.

Robin and Webster (Lyon, 1988) refer that many "people on this planet are suffering intensely not for lack of IT, but because they are deprived of things in superabundance in the Western part of the world and of things that could be made good by use of existent technologies, knowledge and resources".

The majority of these thinkers preview a world where there will be a new separation between those who dominate the technologies and those who don't, thus being controlled by something that they don't understand.

They also view universities, as we know them, evaporating, giving place to corporations or other institutions, that will explore the 'knowledge market'.

In the next sections we will try to emphasize these two viewpoints while analyzing the future of universities through different "lenses".

Technological

The utopian thinkers see the new information technologies as a great tool to improve education and the learning process. Technology and digital multimedia will enhance the student's learning experience. As Newt Gingrich (cited in Newsweek 2001) puts it, "Learning will be high tech and high touch. By the time you can explain it on a chalkboard, you could build a virtual immersion in which [students] could experience representations of atoms actually vibrating".

Besides enhancing education, these technologies will also allow it to be "customized for you", as Danny Hillis defends (cited in Newsweek 2001), and "new technologies and software […] will teach you what you need to know when you need to know it".

Papert states (cited by Tapscott 1998), "this will make it possible for the dream of every progressive educator to come true: In the learning environment of the future, every learner will be 'special'".

Paper (cited on Newsweek 2001) also says, "Instead of fragmenting knowledge into 'subjects' and segregating children by age, we will see groups formed around common interests." So the key, he continues, will be to give "every kid some sort of personal, portable and connected computing device. It should be an extension of your hand, eye or brain".

The Internet and the personal computer will provide an easy access to the best information by anybody, everywhere. As Tsichritzis (1999) puts it, "communication technologies and computers will allow people to access the best specialists on the planet at the touch of a button, while allowing each individual to proceed at the desired pace. These technologies will provide easy access to entire networks of data collected from all around the globe, while saving hours of searching in library stacks".

Most of these writers defend that the gap between the rich and the poor will be reduced, and the main challenge will be the fight against the "digital divide" – the gap between those who have access to information technologies and those who don't.

The majority of governments tend to believe these trends, and are actively supporting the introduction of these technologies into schools. Due to this, Giddens (1998) states, "multimedia technologies will, without doubts, find its way trough education".

On the other hand, Neil Postman, one of the most anti-utopian thinkers of our time, refers (1998) that "radio, movies, television, computers, are all useful to teach us. But they are not a substitute for what has to happen between a teacher and a student for us to claim education has occurred". Education is more that the delivery or access to information.

Postman (1998) continues saying that although data and information can be represented in an explicit form and thus transmittable through digital means; learning is not only about the delivery of information. "To a person with a computer, everything looks like data", he says. Papert (1990) reinforces this idea, referring that "knowledge is not transmitted, it is constructed. Each individual must reconstruct knowledge".

Cleary, they say, learning is also a social experience. Tapscott (1998) refers that "many still remember the university experience as the greatest time of their life". Nor the charisma or experience of the teacher is transmittable through 'wires'.

About the huge amounts of information that the Internet has made accessible, Postman (PBS, 1996) notes that the absence of 'gatekeepers' (someone useful in separating the irrelevant from the relevant and the true from the false) is clearly a problem.

Addressing Internet's credibility, Berghel (1997) states that it "will forever remain, credibility and value-neutral". Meaning by this that the mere fact that a resource is available on the Internet does not provide "any guarantee of importance, accuracy, unity or value".

Concluding, Postman (PBS, 1996) defends that "if students get a sound education in the history, social effects and psychological biases of technology, they may grow to be adults who use technology rather than be used by it".

Spatial

'Distance learning' and 'virtual classrooms' are popularized ideas of what the new communication technologies will bring to education.

According to utopian ideas, a new world of possibilities will open, allowing the dilution of physical barriers. Tsichritzis (1999) advances, as cited before, with the concept of uniting the best specialists from around the world. And he continues stating that "before, the best people were concentrated in the best universities. Now, the best people will not even have to move".

Education, they predict, will be at "the distance of an Internet connection" eliminating several costs and overcoming all sorts of barriers. People with disabilities will be able to access universities in the same way as other students.

Tsichritzis (1999) conceives a scenario where universities become global providers of specialized knowledge, and distribute that knowledge, through other universities, all around the world. Poorer countries will not need to set up expensive courses to teach all subjects, they'll be able to buy them to other faculties, at lower prices, through networks.

Besides diluting physical barriers, digital technologies will also allow the overcoming of time barriers, allowing asynchronous learning.

Although predicting its inevitable appearance in the future, Giddens (1998) says that "the 'wall-less classroom' seems to be, for now, something out of question".

Anti-utopian criticisms focus on the aspects of dehumanization of people. The risk of we all becoming spatially separated, mediated only through machines. Although proclaiming the benefits of distance learning, Tsichritzis notes that "no technology can substitute for human presence".

Cultural

Due to the evolutions in technology and the consequential need for increased abilities to work, education through life will be fundamental. (Giddens, 1997) This assumption, shared by many thinkers, will be the main driver of cultural changes to the universities.

So, utopists say universities will stop being an isolated landmark in one's life, and start offering courses addressing 'life-long learning'. Due to this, university's role in society will change. They will no longer be seen as a turning point in our lives, a place where we get our education and make the passage to adulthood. These last aspect, as Noam (1995) sees it, "could be replicated in other ways […] often in more attractive locations and climates".

Universities are deeply associated with the industrial revolution. Books and printed materials wore massively distributed and produced due to evolutions in machines and factories. "Nothing is more characteristic of school than the book or the scholar manual" (Giddens, 1997). Information and telecommunication technologies will change this landscape, in the same way books did.

Technology "touches the very substance of the university, that is, knowledge development and transfer" (Tsichritzis, 1999). Knowledge will be developed globally, by the most specialized university in each area, and then transmitted through networks. This way, local universities will be able "to concentrate mainly on fields related to their culture and import educational services" (Tsichritzis, 1999).

Utopians see a world of connected universities exchanging knowledge (as services), and local universities being able to focus on regional questions and problems. The globalization of knowledge.

Dystopians picture a world were universities, in an extreme situation, will vanish, leaving their place to commercial institutions.

The need for permanent education will lead corporations to enter the education market. Universities will be under extreme pressure to compete in this scenario. Due to the impossibility of keeping pace will all the knowledge in all the areas, universities will specialize, thus becoming one more, of several, provider of knowledge. They will loose their status of a local 'bastion of knowledge'.

With the creation of a global "education market" curriculums will loose their local roots and people will learn according to those who dominate the production of content (i.e.: Microsoft's Encarta).

R&D taking place at universities will also, gradually, move to commercial institutions.

Giddens says that "it may happen that school itself becomes increasingly unimportant because students can learn at home using computers".

Drucker (cited by Tapscott, 1998) says that, if universities are unable to respond to the challenges posed by continuous education and commercial institutions, their role in society will vanish.

Postman (1998) calls attention to the fact that computers are seen as 'gift of nature' by younger generations, and not as artifacts produced by humans. People, he says, must pay attention to this fact and use technology in their own benefit rather that, he alerts, be used by it.

Concluding, education will be transformed in a economy, where teaching will be treated like a commercial product.

Occupational

Providing students with a closed set of knowledge will no longer by the goal of education, find, analyze and correlate knowledge will be more important. This is a consequence of the ever-growing knowledge base and its renovation. People cannot expect to be settled for life with one higher course, their knowledge will be outdated. This is more obvious in some disciplines than others, but it's the actual trend.

The need for life-long learning and the tremendous amount of information available will produce a change in the way professors teach. They will act more like consultants of resources and facilitators of collaborative work. Their main focus will be to help students develop search and inquiry skills and capacity of independent judgment. Professors will become "information intermediaries" within specific areas of knowledge. (Tapscott, 1998)

The development of networks of universities and the creation of digitally stored curriculums (used in distance learning) will, according to Tsichritzis (1999), allow professors to evolve and produce/maintain content to be reused through classes given by teachers. Teachers will be local coordinator of classes, they won't need to dominate the subjects. Thus, the number of professors can be "greatly reduced" and be freed from time-consuming tasks, like explaining the same thing year after year. Tsichritzis (1999) pictures professors as partners in legal firms.

Students will be more freed to take classes where and when they want. Asynchronous learning will be a reality. Distance learning scenarios involve physical presence on a regular basis (i.e.: weekly reunions with teachers), but most of the time work is conducted in a remote way.

Concluding, utopians, view new technologies as a way to free people, allowing them to focus on what's important. Each person can make its own schedule, professor, teacher or student.

Dystopians focus their critics on the controlling aspects of new technologies. People may be physically less restricted, but they are more supervised in every aspect. For example, distance learning software allows the coordinator the check the progress of the student. See which modules have been completed, which lectures students have downloaded, how much time they have taken, etc.

Professors, on their hand, will be controlled by their peers and superiors based on student performance and other metrics easily available with digital technologies and computers.

These thinkers talk about the mining of the creative process and the end of the university's culture due to the computerization of learning.

Dystopians talk about a panoptical society that has consequences to the university's life. Students won't have more freedom to conduct study as they wish, they will be more under control and permanently under evaluation.

Political

In a new era of information and knowledge, universities, utopians defend, will have a central role. They talk about 'knowledge servers' connected in networks all around the world (Duderstadt, 1998).

According to this view, universities will control information and the technologies of its control. Thus 'owning' the most important asset of this new age – knowledge. Consequentially, their political and influential power will increase.

Governments and corporations will seek universities to find answers, studies and condense disperse information about a given subject. This will happen, because individual institutions won't be able to compete with a global network of dedicated institutions, processing and storing the massive amounts of information being produced.

Tsichritzis (1999) defends that universities will have more time to focus on matters of local importance and become an important partner of local governments.

Universities will be the only ones capable of making sense out of all the unstructured and disconnected information available.

Anti-utopians say that it won't be feasible for universities to keep up with the increased need for knowledge recycling and external competition of commercial corporations.

They refer to globalization and that only the best fit and prepared will survive. The pressure brought by commercial institutions entering the education market will lead to the diminishing of university's prestige and their local influence will, consequentially, erode. Only the famous and the string will last.

Within this scenario, governments will seek other, global, providers of expertise. This will happen unless universities become competitive in restricted areas at a global level. (Tsichritzis, 1999)

Economical

The economical landscape and current business model for higher education is certainly going to change.

The current knowledge explosion has reflections on the value of a higher degree, as Richard Soderberg (as cited by Tapscott, 1998) poses, "People mistakenly think that once they've graduated from university they are good for the next decade – when they're really good from the next ten seconds".

Continuous education and specialization of employees will be a must for every competitive company. And the trend is for companies to provide that education.

Tapscott (1998) gives the example that "in 1992 the growth in formal budgeted employee education grew by 126 million additional hours, this represents the equivalent of almost a quarter of a million additional full-time college students – 13 new Harvards". He concludes that employee education is growing 10000% faster than academia.

For utopians, universities will become 'knowledge servers' and gatekeepers in this new era of information. They'll have to restructure to treat students, local governments and other universities as customers (Tsichritzis, 1999). A global economy of knowledge provision will appear and universities (not as they are today) will have a central role.

Regarding this matter, Tsichritzis says that the "problem with universities is that they don't treat students like costumers, thus not providing a quality service. This has to change".

Universities will have to be more efficient to lower their operational costs (i.e.: recycling lectures) in a world of global competition. Regarding this point, Tsichritzis (1999) notes that "universities generate content every day through their courses and seminars. Then they throw it away. There is a certain charm with this approach, but it is not cost effective." Universities must obtain financial rewards through reusing content.

This global competition will make the 'cost of education' to drop, thus being easier for poorer nations to access education. The disappearing of physical structures also reflects in this cost reduction.

A new area of profits will arise with 'life-long learning', enabling universities to maintain their investments on research and development.

On the other hand, dystopians focus their warnings in the risk of universities not being able to compete in a world were knowledge becomes a commercial 'product'.

Nowadays, universities have, in many places, a regional monopoly, but that will change due to communication technologies and globalization. Many new institutions will enter this market. The president of a corporation, who develops educational solutions to adult workers, states that "universities play the main role in education, but there are millions of potential students avid of knowledge, to whom they aren't able to access". (Kenway et al., 1995 cited by Giddens, 1998)

Giddens (1998) states that many of the newcomers to the educational field will be organizations that previously had little or nonexistent relations with schools. For example: cable companies, software developers, telecommunication groups, film producers and equipment providers.

Software companies are actively developing products for the field known as "edutainment".

Most universities around the world are still largely dependent on public financing, but these funds are dying up, worsening the situation. (Tsichritzis, 1999)

Many thinkers warn that, if universities can't respond adequately, they won't be able to survive in this new economy, where corporations are 'throwing' so much money.

Dystopians say that, although the cost of education will lower, its value will also be less due to the constant need for renovation. Concluding that the benefits won't be as much as those put forward by utopians.

Conclusion

Utopian visions have greater impact on the public and are more promoted by the media. In general it's easier to find literature about these authors than those who talk with skepticism about the future. People, in general, prefer positive visions. Nevertheless, we tend to think that both sides should be easily available to the public and equally promoted by the media. In fact, due to the widely spread utopian visions more emphasis should be put in the promotion of anti-utopian ones. The general public could then form its own opinion.

Visions of the future are important in the way that they allow us to think and discuss the possibilities ahead, while being aware of the main challenges and questions.

These visions are, nevertheless, simply predictions made by opinion makers and thinkers.

For example, demonstrating a clear utopian vision, Scientific American, in 1899, said that "the improvement in city conditions by general adoption of the motor car can hardly be overestimated. Streets clean, dustless, and odorless, with light rubber-tired vehicles moving swiftly and noiselessly over their smooth expanse, would eliminate a greater part of the nervousness, distraction, and strain of modern metropolitan life." (BusinessWeek Online, 2001). Practically the opposite has happened.

We must think carefully and with cautious about the images put forward by mainstream thinkers.

Education is a theme about which more predictions and speculation is made. It's a subject that has great impact on the general public and a lot of literature has been written about it.

It's been referred that "about 70-80% of telecommunication experiments made, around the world, with emerging multimedia technologies involve education or have an educational component" (Kenway et al., 1995 cited in Giddens, 1998).

As we could see with this work, the same utopian and dystopian visions appear when discussing the future of higher education. A more detailed analysis, according to six lenses, reinforced these two viewpoints.

Utopians see a world were knowledge has become a valuable asset and universities play a major role. They are seen as 'knowledge servers' connected in a global network. They are pictured as the 'keepers of knowledge' in a society where information has become so abundant and so dubious. In this world, people will need education through life and universities will have a predominant role.

Dystopians, on the other hand, see commercial institutions entering the educational arena and putting the university under great pressure. This pressure will, ultimately, destroy universities as we know them today, because they won't be able to compete commercially. It's not in their nature to exist in a financial driven environment.

We agree with the concept of life-long learning and that commercial institutions will explore some niches of this market. We also think that distance learning will have an important role.

We agree with Tapscott (1998) and Papert (1998), when they talk about the new generation of children and that they will be the main force driving the change in the educational system. They will bring new concepts and new ways of using the

technologies. People tend to use new technologies to do the same things they were doing before, only better. Papert (1990) gives the example of the camera, that when it was invented people would represent like they did in theatre in front of a fixed camera filming. This is clearly different from what we have today – cinema.

Also, we think, multidisciplinary works and projects will be a trend, people will need to master different disciplines. Universities will need to abandon, according to our perspective, structured courses around one subject and start offering courses based on personal interests that aggregate disciplines from different faculties.

Universities should promote the concept of 'learning to learn', where students are taught how to adapt to new environments and are able to rapidly grab new concepts. This is particularly visible in the area of computer science, where new technologies are constantly being developed and a course would be useless if it taught, for instance, one specific programming language. The majority of these courses focuses, correctly, on paradigms and leaves the choice of a specific language to the student.

We think that commercial institutions will never replace university's role in society because they work in a logic of profit that tends to mine scientific work.

So, in conclusion, we think that universities should be aware of the needs of knowledge renovation by its former students, and set forward measures to address this. They also should avoid neither enter in direct competition with commercial corporations nor treat students as customers because that would mine the roots of its philosophy. Universities must be separated from market forces and interests, and focus its efforts in providing a quality education and an independent opinion.

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