The Role of Virtual Education in the Production and Development of Human Knowledge

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ABSTRACT

In light of information technology, the successive change and the rapid aging of knowledge, it has become necessary to reconsider both of the method of education and training alike, in line with the most important requirements of the era of the knowledge economy. In the beginning, I dealt with the knowledge economy, its requirements and its relationship to human development, and then highlight the role of virtual education through its benefits and methods used in providing lessons, and finally we give a summary of some international experiences related to virtual education

Keywords: Virtual education - knowledge - human development - knowledge economy

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INTRODUCTION

Primitive societies in the ancient era relied on natural materials and tried to exploit them in accordance with their frequent and increasing needs, which led to their development and transformation little by little. This development was accompanied by the emergence of industrial societies that depend entirely on energy, but in the modern era, society depends primarily on the information tide, especially after the expansion of the circle of knowledge and research in various fields and the emergence of electronic devices used in information technology, and our present era has been called the information age based on information networks, and considering that the essence of education and its basis is information, it is also affected by the development and technological techniques that gave it a new dimension and concept, and technological development has led to the emergence of the so-called "flexible learning" that can be adjusted and adapted to conditions according to the surrounding circumstances, which makes the learner more in control of the educational process so that he can determine the appropriate times for him and the topics that appeal to him in addition to control the speed of learning according to his abilities, capabilities and available time. It is possible to go to the areas of education, and learn and gain knowledge without leaving the area in which he lives, thus eliminating the obstacle of geographical borders, as well as a large part of the expenses on traditional education; Flexible education includes open learning, e-learning, virtual learning and distance learning. One of the most important advantages of this educational method is that it helps to achieve "continuous education" at any age and under any circumstances in the field of training in terms of saving time and cost for institutions and companies and encouraging workers to develop and enhance their skills and knowledge of different abilities and personalities. In light of information technology, the successive change and the rapid aging of knowledge, it has become necessary to reconsider both of the method of education and training alike, in line with the most important requirements of the era of the knowledge economy. In the beginning, I dealt with the knowledge economy, its requirements and its relationship to human development, and then highlight the role of virtual education through its benefits and methods used in providing lessons, and finally we give a summary of some international experiences related to virtual education.

1- Knowledge Economy and its Requirements:

The industrial revolution was accompanied by the emergence of businessmen who depended in the foundation of their wealth on natural recources and physical work, but in our present age the age of knowledge has been characterized by the emergence of businessmen who have relied entirely on the foundation of their wealth on human thought and its

potential for innovation and creativity, so that human thought has become one of their most important assets. The technological revolution moved the global economy from an economy with a labor and capital intensity to the stage of a knowledge economy where leadership is for those who know, not for those who own, and knowledge has become the basic material and a factor of production factors and the product itself, and this is evident in the service sector, which depends primarily on providing information, processing and dealing with it and providing service on its basis; The classical economy (the resource economy that depends on non-renewable economic resources such as oil) defined two basic factors of production, namely labor and capital, while the modern economy (the knowledge economy that depends on human development) believes that: -Technology and knowledge are essential factors in production. 1 Abu Anas, "The Knowledge Economy" 31/01/2004

- Knowledge is the primary form of capital.

-Knowledge is a major part of wealth and social well-being.

-It is the accumulation of knowledge that leads to economic growth.

-Investment makes technology more valuable and vice versa.

-Investing in research, development and technological innovation drives economic growth.

 It is evident from the foregoing the importance of knowledge and its role in preparing human capital that is thinking and capable of continuous innovation, which is almost the only competitive advantage for organizations in their struggle to survive. It requires lifelong learning; Therefore, the issue of knowledge is no longer related only to managers, leaders and thinkers who take charge of the process of innovation and renewal. Rather, most of the work, including housework, requires a degree of knowledge, and in this framework the knowledge labor can be divided into three areas:

 1• Employment with simple knowledge that requires a small amount of knowledge sufficient to conduct a specific activity.

2• highly specialized knowledge workers in a specific industry such as programming and systems analysis.

3 • Workers with creative and innovative knowledge, whether in inventing a new product or inventing new methods of management. Therefore, it is necessary for the organization to build its knowledge capital by developing its human resources by:

1- **Inculcating and developing knowledge employment:** by teaching the individual how to learn, where does he find knowledge and how can he exploit it?

 2 - **Preserving knowledge within the organization:** by using information systems to preserve knowledge and its circulation among the members of the organization to interact with each other to produce new knowledge that contributes to making experiences and forming the intellectual capital of the organization. • Bill Gates / translated by Abd al-

Salam Radwan, "Informatics after the Internet (The Path of the Future)", World of Knowledge Series - Kuwait No. 231/1998.

3- Mind management and rationalization: where the manager turns from a commander to a guide who supports the spirit of the team, encourages innovation, believes in trial and error, and manages innovative minds that are exploited by the best exploitation by always placing them in a state of challenge so that they explode their energies through continuous and effective education. Louis Hobeika, "Have we adopted the knowledge economy?"   01/31/2004,   http://www.al-moharer.net/moh145/hobeika145.htm

4 Nadim Abdel MoneimNadim, "The Knowledge Economy" 01/31/2004,

It can be said that the knowledge economy is the economy in which knowledge plays a role in creating and developing wealth, and the shift towards a knowledge economy does not mean abandoning the exploitation of raw materials that nature gives, rather, it means focusing more on knowledge, ideas and advanced technologies to increase their exploitation. The knowledge economy is characterized as an economy of abundance more than being an economy of scarcity, unlike most of theresources that are depleted by consumption, actually increases knowledge of practice and use and spreads with sharing; since knowledge is a mixture of learning and accumulated experience and depends on human understanding and perception, in this capacity it can be transformed into goods and services whose consumers are willing to pay in exchange for them. From this standpoint, the status of each country in the new global economy is determined according to the quantity and quality of knowledge that it possesses. Whatever it is, this practical knowledge can only be provided through formal education and cannot be acquired through apprenticeship and training only, and therefore education occupies a special importance in the knowledge economy. Analyse des technologies utilisées dans les formations   ouvertes   et   a   distance   en   France,   03/03/2001, http://campus.sede.enea.it/OTE/sfrancen.htm

2-ContinuousEducation:

The benefit from the knowledge economy depends on the speed and capacity of the country through which it can be transformed into an educational economy. Education does not only mean using modern technology to access comprehensive knowledge, but also means using it to communicate with others for the sake of creativity. In the knowledge economy, individuals and companies are able to produce wealth depending on their ability to learn and share creativity. The importance of education is highlighted in this only way to spread knowledge, so that it is not the monopoly of an individual alone or a group without the other, but rather it transforms the entire organization into a continuous and flexible learning machine at any time, anywhere, at all levels, and for various capacities. Among what was stated in the Declaration of Principles Document at the World Summit on the Information Society held in Geneva from 10 to 12

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December 2003, "Education, knowledge, information and communication are the focus of human progress and well-being ..., and the use of information and communication technology should be promoted in all stages of education, training and resource development. ...; Continuing education, adult education and retraining, lifelong learning, distance learning, and other special services (such as telemedicine) can make a substantial contribution to increasing employability and help people take advantage of the new opportunities offered by them. Information and communication technology for traditional jobs, self-employment and new professions and awareness of information and communication technology and knowledge of its principles are among the basic pillars in this field, ...; realizing the ambition of developing countries and countries with economies in transition depends to a large extent on increasing capacity building in the fields of education, technological know-how and access to information are all major factors in determining the degree of development and competitiveness. Flexible education (which is of course continuous) can take several forms, which are summarized as follows:

• **Openeducation** that gives the learner some freedom in terms of choosing the method, location, speed and also in terms of scientific subjects.Nadim Abdel MoneimNadim, "The Knowledge Economy" 01/31/2004,

• **Distanceeducation**, which is a system in which the teacher and the learner are not together in one place, whether in the same country or in different countries, but they are connected to each other, either via the Internet or by postal correspondence.

• **E-learningislearning** using computers and their various programs, whether on closed networks, shared networks, or open networks. It is flexible, open and remote learning.

• **Virtuallearning** is that section of e-learning that is based on open networks, meaning that communication in it is secured through the Internet. The importance of shifting from a resource economy to a knowledge economy" 01/31/2004,

3- The concept of virtual learning:

With the emergence of the Internet and its applications through the technological developments that occurred in the nineties, especially those related to direct communication and the possibility of creating virtual discussion groups and the introduction of multimedia techniques and voice and video communication from a distance .. The modern type of education known as virtual education appeared, as it began to be adopted in Western universities after Achieving good results, and the emergence of its positive impact in supporting the educational system and raising its efficiency, and achieving the principle of continuous education and access to sources of knowledge easily.

Virtual education is a definition intended to provide the learner through the network with the knowledge he needs in the various selected subjects or the chosen specialization, for the purpose of raising the scientific level or

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for the purpose of qualification and training, using audio, video, multimedia (multimedia), electronic books, e-mail, groups Chat, debate ... etc.

Virtual education can be divided into two main parts, the education department, which has an academic nature and is directed to students who seek to obtain official and recognized certificates, and is undertaken by universities and institutes, and the training section directed to employees of companies and institutions or aspiring to work in such companies and want to obtain professional training that qualifies them to work in it or for those wishing to expand their knowledge and capabilities in a specific field. The Arab Human Development Report 2003, "The Regional Office for Arab Countries - United Nations Development Program - New York, USA, 2003. 01/31/2004,

The purpose of virtual education is to increase educational opportunities for everyone and obtain qualifications and degrees without going to universities, as virtual institutions are an open and continuous training center without barriers where you can be anywhere in the world in your office or home at any time, and you can also follow your professional future And your business as your studies progress; the emergence of virtual education did not come to abolish the role of traditional education. Rather, it came within the framework of integration with the aim of bringing about qualitative development in human development within the plan for development and modernization of human resources, so the individual needs a certain level of educational attainment, qualification and appropriate preparation to occupy a position and succeed in it, and in addition to that he needs to Continuing his educational attainment and the acquisition of new skills required by his position, as a result of development and innovation, and because of the acceleration of knowledge and technological growth.

Registration is usually done in these educational institutions, through various means of communication, and via e-mail in particular, and examinations are often conducted using the network, in specialized centers accredited and licensed for this, or in the cultural centers of the countries to which the educational institution belongs.

4- Benefits of virtual education:

The importance of the trend towards providing virtual education services to many educational institutions increases daily, especially after the spread of the Internet, as a tool and a means of clarification in the educational process, as individuals of different groups and ages refuge to this type of education for various motives, including:

• Convenience and flexibility in scheduling study times, which prevents absenteeism from work.

• Get immediate access to the latest modifications to the program.

• It is the ideal solution for the education of individuals who are geographically separated.

• The achievement of the principle of continuous education for individuals.

• Lower costs and profit time when we avoid to travel.

• It is distinguished by the multiplicity of educational means and the diversity of educational materials, from regular and divergent texts, and still images, to audio and video files, video conferences, chat groups and discussions. Distance education, 12/10/2003, http://www.savie.com/disted.html

• It can take place simultaneously (direct online communication between the teacher and the learner) or asynchronously (where the scientific material is available on the network for each person to deal with according to his time and personal ability).

• It helps to interact between different cultures and peoples.

• Raising the efficiency of the learner or trainee in performance and raising its value in the labor market.

• Developing the skills of using modern information and communication technology. The most important benefits that accrue to the organization are confined to:

• Creating an appropriate environment and culture for the development of knowledge labor.

• To achieve self-training and learn the required skills.

• Training the largest number of workers at a low cost.

• The speed of publishing news and instructions.

• Obtaining the best possible solutions to the problems raised in the network.

Virtual education differs from other teaching methods in that it is done at the appropriate time (appropriate for the learner / trainee), for the appropriate individual (each learner takes only what suits him from the program according to his personal needs that may differ from other participants in the same program), in the appropriate place (at home, at work, in a public library or an Internet café), in the appropriate form and content (in terms of quantity and quality), with the appropriate speed (where people differ in their abilities and speeds of assimilation, so each participant moves from one stage to another when he is sure that he has grasped what he has studied according to his personal abilities and speed of assimilation).

5- Virtual Education Requirements:

Virtual education has requirements, as the recipient must have a computer equipped with a modem and multimedia hardware, a subscription to the Internet, possession of an e-mail, and a minimum of technical knowledge in using the computer; in general, communication between students between them and the teacher takes place, in prior coordination, by means of electronic communication, which are e-mail, chat rooms, and discussion forums, and it is also possible in special cases to use additional technologies and special software that is called the virtual hall or the virtual campus, depending on the nature of the

educational material, and technologies available at the educational institution.

The virtual teaching is based on two methods of presenting lessons, the hypothetical class (or section) method and the self-teaching method:

A- **Thevirtualclassroom(Laclassevirtuelle):** It depends in providing its services on setting a certain timing in advance, for broadcasting lessons remotely, so the lecturer delivers the lesson directly, and at the same time the concerned people view the explanatory documents for the lesson on their screen and listen to the records; this type of lecture is called the audio lecture (Audioconférence), and if the individual learner (the student) can view the lectures and ask inquiries, the lecture is called the visual lecture (Visioconférence).) And its accessories, a self-propelled camera (digital camera), an electronic whiteboard in addition to a set of programs that lead to video lectures, and the lesson recipient (the individual learner) is required to join the virtual class to provide a networked multimedia computer equipped with a web camera (optional), Real Player; audio capture software and the image, the Webconf Program to track what is written on the whiteboard from the explanations and clarifications of the minutes, or a similar program such as Netmeeting.

The lecturer delivers his classic lecture using the electronic whiteboard instead of the regular board behind the camera that transmits what is going on in the virtual classroom to the second part, and if the second part is also equipped with a camera, the lecturer can watch him and respond to his questions at the moment. The discussion can take place between the lecturer and a specific student without the intervention of another student, so the matter is left to the lecturer, so he has the right to select the interveners and he has the right to participate the student in a specific application (Partaged'application) he wants, and he also has the right to monitor the student's computer remotely (this is of great importance in administering exams remotely).

In the case of the audio lecture, the second part does not necessarily have a camera, because the approved communication system is based only on sending voice and explanatory texts.

Video lectures can take place via satellite by sending and receiving waves that contain sound and image, such as television (La télévision interactive) in direct remote dialogue, and this technology is characterized by a fast and large flow of more than 216 Mb / s. The video lectures may be bidirectional and are very expensive, It may be unidirectional by using a television set to receive the lecture, and using the phone for the debate.

Video lectures require significant flow according to the nature of use, we summarize it in the table below:

Visioconferencing	Animation	Flow
single	motion slow	64 Kb / s - 2 x 64 Kb
collective	motion slow	2 Mb / s - 384 Kb / s
collective	Acceptable movement	Mb/sfrom 6 to 8
collective	Quick movemen	from 216 to 270Mb/s

B- Self-education (Autoformation):
Self-education depends on drawing lessons from the educational institution's website (BBS, Web) by the learner with his participation in forums and discussions via e-mail at the time he wants and from wherever he is.

6- International experiences and expertise:
There are a large number of countries that have successful experiences in the field of virtual education, and it has been customary in virtual educational institutions from time to time to offer some free courses, to encourage students to attend them, while some offer a permanent free course, for the same reason, we mention the following some experiences: - The Arab Communications Company provides online study services from its well-known website at the Arab University, which was established since October 25, 1997, and it is the first, aimed at Arabic speakers, and provides for those wishing to study different fields, its educational courses are free and available to everyone, regardless of their academic degrees for university and other undergraduates, regardless of age, profession and personal skills, communication between the student and the professor is carried out by many means such as discussion panels, chatting, and some multimedia techniques. The exams are conducted in two phases: 11☐Exemple de visioconférence& configuration de Netmeeting, 03/03/2001,

- A direct examination through the Internet, and a lengthy, indirect exam, which requires prior preparation by the student and sends it by e-mail. The university provides electronic certificates of competency that are sent to the successful student via e-mail, followed by a printed paper certificate, which is sent by post upon request.

University curricula and degrees are scientifically evaluated by universities, such as the Egyptian "Ain Shams University" and the Canadian University of Toronto.

☐**The Arab Electronic University** enables its pioneers to:
• Get to know all who attended the course.
• Conversation with all course attendees.
• Using the Arabic library, which enables you to refer to any reference, study, or assistance you want
• Technical advice.

Among the courses offered by the Arab Electronic University are computer science courses, business courses, courses for women and courses for children.

☐**VirtualAfricanUniversity:** UNIVERSITÉ VIRTUELLE AFRICAINE (UVA) specialized in technological and technical sciences. This university offers courses in information technology, university preparatory courses, language courses, training and institutional courses, economics courses, ... and others. The university's goal is to raise the educational level of the trained and increase the skills of specialists for the sake of economic development in their countries, and to cover the deficit in African education systems that suffer from a shortage of components and references; the university started its activities in July 1997, and the university cooperates with 22 African universities of different curricula, and a group of cooperating professors from Africa, North America and Europe participate in providing lessons.

☐**TheWebsiteoftheCampus(électroniqueCampus):** which is supervised by the Distance Education National Center, 'Center National d'Enseignement à Distance' CNED: Affiliated with the Ministry of Higher Education and Research in France, this campus offers its services to registrants from inside and outside France, and it provides its students with all that the traditional university provides; electronic library, directions, evaluation, configuration lists, ... and more.

☐**TheInformaticsInstitute** of **the** University College Notre Dame in Belgium offers supplementary courses for its students directly online, and there is another officially recognized Arab university, such as the Syrian Virtual University, which is the cornerstone of the human resource development and administrative reform plan in Syria. There are also several training and rehabilitation sites owned by institutions or individuals that contribute significantly to the development of human knowledge and the knowledge economy.

☐As for the Algerian experience in using virtual distance education technology, it is still in its beginning despite its pioneering experience in the field of distance education. The first experience in the field of virtual education, which is still in existence, is supervised by the Continuing Education University, which established a virtual site through which it transmits complementary lessons. For its students in some disciplines, this university has been chosen by UNESCO as the AKC Knowledge Center within the Ibn SINNA Project for the Virtual University of the Mediterranean Countries, and a platform will soon be established to be used to broadcast lessons.

Conclusion

The virtual education requires discipline so that the student improves the use of time, and also requires self-reliance in learning. In our point of view, humanity will not dispense with traditional education, which is the basis, and distance education in its branches is complementary to it, as some comparative research between distance education and between traditional education indicates the possibility that they have the same effectiveness when the methods and techniques used are appropriate to the subject of learning.

•Providing an advanced infrastructure of information and communication networks and their applications, as a tool to support education and be easily accessible at a reasonable cost, to be exploited on a larger scale, and if it is necessary to establish access points, especially in deprived areas in places such as post offices, schools, libraries, etc., then the Massachusetts Institute of Technology (MIT) Placing all its materials on the Internet without any costs incurred by the beneficiaries. • Educating leaders and decision-makers in institutions of the challenges of globalization and the need to reduce the digital gap between those who own technology and those who do not possess it, and this will only be achieved through knowledge that is the essence of education and training.

• Preparing the necessary laws and legislations to approve the electronic document, electronic payment, electronic signature, protection and security of networks and their pioneers to build confidence in the use of communication and information technology.

• Preparing a program for education, qualification and training in advanced technologies at the level of basic, intermediate and higher education in all fields: legal, commercial, medical, economic, ... etc.

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