

Investigation of some Aspects of the History of Distance Learning*

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Abstract. The article examines a few issues of e-education, also called e-learning and online learning. Distinctive features of this form of education are the physical separation of teachers and students during the sessions and the use of various technologies to facilitate communication between student and teacher. Distance learning is traditionally focused on non-traditional students, such as full-time employees of enterprises and organizations, military personnel, as well as non-residents or individuals in remote regions who cannot attend lectures in an audience. Also, this article discusses the dynamics of the development of distance education, which is an indicator of the relevance of e-learning.

Keywords: model, education, process, development, technology, universities, goals.

1 Introduction

The development of civilization is the history of continuous learning of something new, human life is a constant process of knowing oneself, the world around and its places in it. Early, education implied close personal contacts of students with a mentor. With motivation, such tutorials gave excellent results but education remained a privilege for the elect. The problem of accessibility of education was solved by the appearance of distance learning.

2 Consideration of the development of distance education in retrospect

The history of studying at a distance begins with the end of the XVIII century. It was during this period in European countries that a new term appeared - "correspondent education", which was introduced by Isaac Pitman, who taught students of shorthand in the UK. The students received educational material, talked with teachers and passed exams by mail.

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More and more universities in the world offer distance learning opportunities. A pioneer in this area is the University of Phoenix [7], which was founded in Arizona in 1976 and by the first decade of the 21st century became the largest private school in the world with more than 400,000 students. He was one of the first to introduce distance learning technology, although many of his students spend some time in classrooms in one of the dozens of campuses in the United States, Canada, and Puerto Rico. The exact figure for the number of foreign students enrolled in distance education has not been published, but the number of enrolled students in the two largest state universities that actively use distance learning methods gives some digital guidelines: at the beginning of the 21st century, the Indira Gandhi National Open University with headquarters apartment in New Delhi [4], has received over 1.5 million students, and more than 500,000 students have studied at the Central University of Radio and Television of China with headquarters in Beijing Comrade.

Students and educational institutions master distance learning for various reasons. Universities win by expanding the number of students, since there is no need to build classrooms and student dormitories, and students can work where and when they want, combining work with higher education. School systems offer special courses, such as language learning with a small number of students in groups and Advanced Placement classes [2], without the need to create multiple classrooms. In addition, students studying at home have access to centralized learning.

Various terms are used to describe the phenomenon of distance learning. Strictly speaking, distance learning (student activity) and distance learning (teacher activity) together make up a distance education system. Common options include e-learning or online learning, used when the internet is the medium; virtual learning, which usually refers to courses held outside the classroom with primary or secondary school students (and also usually using the Internet); distance learning, a long-used method in which individual training is carried out using mail; and direct education, the standard system of education in Europe in a regular university.

Distance education is characterized by four main characteristics. First, distance learning is by definition carried out through higher education institutions; This is not a self-learning or non-academic learning environment. Higher education institutions may or may not offer traditional classroom teaching, but they are eligible for accreditation by the same government institutions like universities that use traditional teaching methods.

Secondly, the geographical separation inherent in distance education divides pupils and teachers. Accessibility and convenience are important advantages of this learning method. Well-designed programs can also bridge the intellectual, cultural, and social differences among students.

Thirdly, interactive telecommunications connect people in the study group and with the teacher. Electronic messages such as e-mail are most commonly used, but traditional forms of communication, such as a regular mail system, can also play a role in the learning process. Regardless of the environment, teacher interaction with students is necessary for distance learning, as for any other education. Communication between students, teachers, and learning resources are becoming less dependent on physical proximity, as communication systems become more complex and widely available.

Thus, it is legitimate to conclude that the Internet, mobile phones and e-mail contributed to the rapid growth of distance learning.

Finally, distance learning, like any education, creates a learning group, sometimes called the learning community, which consists of students, teachers, and learning resources, that is, books, audio, video, and graphic displays, which allow the learner to access the content of the subject. Social networks on the Internet promote the idea of building a virtual community. On sites like Facebook and YouTube, users create profiles, identify members (“friends”) with whom they keep in touch, and create new like-minded communities. In the conditions of distance education, such networks can create connections between students and thereby reduce their sense of isolation.

Considering the process of development of distance education, I would like to draw attention to a rather long history of distance learning, which began with the creation of correspondence schools in the 19th century.

Geographical isolation from schools and scattered religious congregations stimulated the development of religious distance learning in the United States in the 19th century. For example, the Sunday School Assembly at Lake Chautawka in the western state of New York [3] began in 1874 as a training program for Sunday school teachers and church ministers. Going beyond its religious background, the program gradually expanded to include a non-denominational course on home-based reading and distance learning. His success led to the founding of many such schools throughout the United States, the so-called chautauqua movement.

There was a fairly high demand for this type of training from industry, government and the military. This situation has pushed the distance learning system to new levels of development.

In Europe, mail courses were created by the middle of the 19th century, when the Society for Modern Languages in Berlin offered correspondence courses in French, German and English. In the United States, companies such as Strayer's Business College from Baltimore (now Strayer University) were founded, which was founded in Maryland in 1892 and included correspondence courses by mail to meet the needs of employers, especially in training women for secretarial duties. In most non-religious correspondence courses by mail, special attention was paid to the teaching of spelling, grammar, writing business letters and bookkeeping. In addition, new areas of distance learning have appeared: from the development of esoteric mental abilities to work in a beauty salon. The undisputed leader in distance education in American higher education at the end of the 19th century was the University of Chicago, where William Raine Harper [9] used the methods he developed as director of the education system at Chautauqua for several years, starting in 1883.

From this time period, one can speak of the development of early educational theories and technologies, such as behaviorism and constructivism.

During the first half of the 20th century, the use of educational technologies in the United States was strongly influenced by two developing schools of educational philosophy. Behaviorism, led by American psychologist John B. Watson [8], followed by B. F. Skinner, who ignored all subjective mental phenomena (for example, emotions and mental images) in favor of objective and measurable behavior. A constructive ap-

proach emerged based on the ideas of progressive education put forward by the American philosopher John Dewey [1], who stressed the need for the education of "the whole child" to achieve intellectual, physical and emotional growth and argued that learning is best carried out by children, rather than striving to memorize the facts. Constructivism, the leading figure of which was the French developmental psychologist Jean Piaget [5], argued that learning arises as a result of the construction of mental models based on experience. These theories have led to different methods of using the media in the classroom, where behaviorism concentrates on changing student behavior and constructivism on learning based on processes and experience.

One of the first technological assistants in education was the lantern slide (for example, the Linnebach Lantern), which was used in the 19th century chautauqua classes and lyceum schools for adults, as well as in mobile public lecture shows around the world to project images on any comfortable surface; such visual aids have proven particularly useful in educating an illiterate audience. By the beginning of the 20th century, learning theories began to focus on visual approaches to learning, in contrast to the practice of oral reading, which still dominated traditional classrooms.

The first significant technological innovation was made by American inventor Thomas Edison [11], who invented the 1877 Phonograph foil.

This device made it possible to create the first language laboratories (rooms equipped with audio or audiovisual devices for use in language learning). After the First World War, university-owned radio stations became commonplace in the United States, and by 1936, more than 200 such stations broadcast recorded educational programs.

Edison was also one of the first to produce films for the classroom. Many colleges and universities experimented with the production of educational films before the First World War, and during the war educational films were widely used to train a diverse and often illiterate population, soldiers on various topics - from military equipment to personal hygiene. Improvements in filmmaking, in particular, the ability to create "walkie-talkies", were used immediately before and during World War II for technical training and for propaganda purposes. While the propaganda itself may have been *Triumph of the Will* (1935), one of a series of films made by Leni Riefenstahl for the German fascist government in the 1930s, similar films were shot by all the main belligerents. In the United States, the army ordered Hollywood filmmaker Frank Capra to produce seven films, the well-known series "Why We Fight" (1942–45), to teach American soldiers what was at stake.

TV training courses began to be developed in the 1950s, first at the University of Iowa. By the 1970s, community colleges throughout the United States had created courses for broadcasting on local television stations. Various computer education experiments also began in the 1950s, such as programmed or computerized instruction, in which computers are used to present teaching materials consisting of text, audio, and video, as well as to evaluate student performance. Most of the early studies were conducted at IBM, where the latest theories of cognitive science were incorporated into the application of educational technologies. The next major achievement in the field of educational technologies was the connection of computers via the Internet, which made it possible to develop modern distance learning.

What can we attribute to modern educational technologies? Firstly, it is an online course.

By the beginning of the 21st century, more than half of all two-year and four-year institutions of higher education in the United States offered distance learning courses, mainly via the Internet. With over 100,000 different online courses to choose from, about a quarter of American students took at least one such course every semester. The general target population groups for distance learning are professionals seeking re-certification, employees who upgrade employment skills, disabled people, and active military personnel.

Although the theoretical trend that began in the 1990s seems to have been more dependent on video, audio, and other multimedia, in practice most of the successful programs used electronic texts and simple text messages. The reasons for this are somewhat practical — individual instructors often bear the burden of creating their own multimedia — but also reflect a developing understanding of the main advantages of distance learning. Now it is seen as a way to facilitate communication between teachers and students, as well as between students, eliminating time constraints associated with the exchange of information in traditional classrooms or during teachers' working hours. Similarly, self-learning software educational systems, although they are still used for certain narrow types of training, have limited flexibility in responding and adapting to individual students, which usually require some interaction with other people in informal educational settings.

Modern distance learning courses use web-based course management systems that include digital reading materials, podcasts (recorded sessions for electronic listening or viewing at a student's leisure time), e-mail, multi-threaded (connected) discussion forums and chat rooms in virtual (computer) classes. Both proprietary and open-source systems are common. Although most systems are usually asynchronous, which allows students to access most functions at any time, they also use synchronous technologies, including live video, audio, and general access to electronic documents at scheduled times. Shared social spaces in the form of blogs, wikis (websites that can be changed by all participants in the audience) and jointly edited documents are also used in educational institutions, but to a lesser extent than similar spaces available on the Internet for communication.

Secondly, it is web services. Along with the growth of modern institutional distance learning, personal educational services have appeared, based on web technologies or facilitated, including e-learning, e-tutoring and research assistance. In addition, there are many educational assistance companies that help parents choose and contact local tutors for their children, while companies handle contracts. The use of distance learning and tutoring programs has increased, especially among parents who consider it necessary to organize homeschooling for their children. Many universities have some online tutoring services [10] for corrective help with reading, writing, and basic math, and some even have online tutoring programs to help doctoral students in the process of writing a dissertation. Finally, many online personal assistant companies offer a wide range of services for adults who want to receive continuing education or professional development.

One of the most notable types of educational institutions that use distance learning is the so-called open university. Opened in the sense that almost everyone can study there, regardless of age. Since the middle of the 20th century, the open university movement has been gaining momentum around the world, reflecting the desire for greater access to higher education for various groups, including non-traditional students, such as the disabled, military, and prisoners.

The origin of the movement can be traced back to the example of the University of London, which began offering degrees for foreign students in 1836. This paved the way for the growth of private correspondence colleges, which prepared students for the University of London exams and allowed them to study on their own to get a degree without formal admission to the university. In 1946, the University of South Africa, with headquarters in Pretoria, began offering correspondence courses, and in 1951 it was converted to training courses only for foreign students. The idea of creating the “University of Air” proposed in the UK was supported in the early 1960s, which led to the creation of the Open University in 1971 in the so-called new city of Milton Keynes. By the end of the 1970s, 25,000 students were enrolled at the university, and since then their number has increased to hundreds of thousands a year. Open universities have spread around the world and are characterized as “mega-universities” because their enrollment can exceed hundreds of thousands or even millions of students in countries such as India, China, and Israel.

Being one of the most successful non-traditional institutions with a research component, the Open University is a major source of both narrow scientific and pedagogical literature in the field of open universities. The university relies heavily on prepared materials and a system of teachers. Initially, the printed text was the main means of education for most Open University courses, but this changed somewhat with the advent of the Internet and computers, which allowed the distribution of written assignments and materials via the Internet. For each course, a student is assigned a local tutor, who is usually contacted by phone, mail, or email to help with questions related to educational materials. Students can also attend face-to-face local classes conducted by their mentor, and they can form self-help groups with other students. Assigned assignments and discussion sessions are the main aspects of this educational model. Teachers and interaction between individual students are designed to compensate for the lack of in-person lectures at the Open University. To emphasize aspects of teaching and individual learning, the Open University prefers to describe it as “supported open learning” rather than distance learning. Naturally, the organization of distance education is faced with certain academic problems, the solution of which will allow developing it in the future.

From the very beginning, correspondence courses acquired a bad academic reputation, especially those provided by commercial organizations. Back in 1926, as a study commissioned by Carnegie Corporation showed, fraud was widespread in the correspondence schools of the United States and there were no adequate standards to protect the public. Although the situation later improved due to the introduction of accrediting agencies that set standards for the provision of distance learning programs. In addition, there were always problems with the quality of educational experience and the verification of students' work. The introduction of distance learning in traditional educational

institutions has given rise to fears that one-day technologies will completely destroy ordinary educational audiences and people-teachers.

Since many distance learning programs are offered by commercial institutions, distance learning has become associated with the commercialization of higher education. As a rule, critics of this trend point to the potential exploitation of students who are not able to enroll in traditional colleges and universities. There is a certain temptation in commercial schools to lower academic standards for higher incomes and a corporate administrative approach that emphasizes “market models” in educational curricula. In addition, the development of courses and curricula designed to attract wider demographic groups to generate more institutional revenue — all to some extent confirms the decline in academic standards.

It is important to emphasize that modern distance learning technologies in education are an important element of the organization of education of students with special needs in inclusive audiences. Here, special requirements are placed on the availability of infrastructure, the development of new teaching materials based on new needs, the formation of new methods for assessing the results of the educational process. With such an organization of the educational process, it is quite possible to ensure the satisfaction of the individual learning needs of all students, along with special attention to those who are vulnerable to marginalization and isolation. Inclusive distance education as an approach to the learning process implies that all students with or without special needs will be able to study together through access to a common, flexible education system.

As the study shows, among the prevailing barriers to the successful implementation of distance education are limited government support, ineffective policies and legislation, a shortage of qualified teachers and support staff, political instability and the economic crisis. In addition, the inefficient use of assistive distance technologies is also viewed as the main obstacle preventing the proper organization of inclusive education.

In accordance with the foregoing, distance education is the most important component in the development and empowerment of individuals, their inclusion in education, regardless of the various socio-economic differences and differences in “abilities” and “needs”. In the system of university education, special attention should be paid to “education for all”. The right of all students to meaningful education based on individual needs and abilities should be ensured.

The use of assistive technology devices will help reduce, if not eliminate possible interference, and circumvent the information deficit to help individual students to actively participate in the learning process and in solving related problems. Assistive technology in general sets out a continuum of tools, strategies, and services that must meet the needs, abilities, and objectives of the person and includes an assessment of the needs of the individual with special needs.

One of the areas of the use of assistive technologies in inclusive distance education is the creation of specialized audiences in individual universities to meet the various training needs.

Creating such technological audiences has great potential in providing access to a common curriculum and additional information for all students. Auxiliary technology of distance education, in this case, is a general direction, which includes assistive and

rehabilitation devices for people with increased needs. It includes almost all the necessary components that can be used to compensate for the lack of certain abilities, using low-tech devices, such as crutches or a special pen for writing. Or more technological elements, such as hearing aids and glasses. High-tech devices, such as computers with specialized software, are also used to help ensure dyslexic reading.

The auxiliary technologies of modern distance education serve to bridge the gap between abilities and needs by actually assisting in ensuring the process of teaching students in one common “distance audience”, including students with physical and mental disabilities. These technologies help students master the learning material by removing barriers that prevented them from being at the same level as their peers.

3 Conclusions

Distance learning, whether in commercial or traditional universities, uses two basic economic models designed to reduce labor costs (faculty). The first model involves the replacement of labor with capital, while the second is based on the replacement of the faculty with cheaper labor. Proponents of the first model argue that distance learning provides economies of scale by reducing staff costs after the initial investment in things like web servers, electronic texts, and multimedia applications, as well as online programs for interacting with students. However, many institutions that have implemented distance learning programs through traditional teaching and administrative structures have found that the recurring costs associated with these programs may actually make them more expensive to establish than traditional courses. The second basic approach, the “work for work” model, is to divide the role of teachers into functions of preparation, presentation, and evaluation, and to ensure the performance of some teaching functions by less paid employees. Open universities tend to do this by creating course committees and hiring part-time teachers to help students with learning difficulties and to evaluate their knowledge, leaving actual teaching responsibilities in the classroom, if any, to professors. These distance learning models suggest that the biggest change in education will be associated with changing roles for teachers and completely different student experiences.

The emergence of massive open online courses (MOOC) in the first and second decades of the 21st century was a major shift towards distance learning. MOOCs are characterized by an extremely large number of students — tens of thousands — using short videotapes and short videos. The format of open online courses was used in the early stages of some universities, but it did not become widely popular until such providers as Coursera, edX, Khan Academy and Udacity appeared. Although the original purpose of MOOC was to provide informal learning opportunities, there were experiments using this format to obtain diplomas and certificates from universities.

All of the above does not in any way reduce the values of distance education in the world of modern information technology. And some errors and shortcomings of this system can be avoided by using the experience of previous generations of teachers and scientists.

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