# Lifelong Education as a Challenge of Digital Era

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**ABSTRACT**

Digital trends in social and economic development change the labour concepts and attitudes towards careers. Through the life course people more often change their job, residence, specialty. That circumstance implies the need for new skills or retraining within the space of lifetime. This study is based on the assessment of the continuity of Azerbaijani education in the digital economy. The work was performed within the framework of the methodology proposed by the World Bank and aimed at interpreting and combining particular outputs of statistical studies, since a comprehensive statistical survey of the digitization of education has not yet been carried out. The results, on the one hand, indicate great promise in terms of system enhancements and expansion of lifelong education opportunities for all categories of citizens through development of the Azerbaijani digital space and increase the number of training organizations. On the other hand, the development of this direction is weak and of an ad hoc nature: specific goals and objectives, supply and demand, formal and informal methods in each field of Azerbaijani education are not fully taken into account.

**Keywords**
Digital Economy; Information Technologies; Continuing Education; Ongoing Build-up of Digital Literacy

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## Introduction

Throughout the entire existence of mankind, society in its development went through three stages: agrarian stage with a predominance of agriculture and manual labor, industrial stage with industry dominance and post-industrial or digital stage, which is characterized by the dominance of services in the economy and the emergence of information technologies.

The digital economy, namely the emergence of new opportunities certainly has a positive effect on a person's life.

In this study, one of the tasks under consideration is identifying a number of problems in the digital economy from the perspective of lifelong education in order to maintain a coherent system of rational management. Those objectives include an analysis of the minuses that emerged with the introduction of the "digits" in the life of mankind. Among them we call rising unemployment in the labor market, since the risk of disappearance of some professions and even industries increase: for example, many experts seriously believe that the banking system will disappear over the next ten years (Charungkaittikul, 2018). This will be possible due to the further spread of information technology and its products, such as: shops with electronic cash registers, bots serving customers, self-driving cars and other things. It is also necessary to note the "digital divide" – the gap in digital education, in terms of access to digital services and products, and, as a result, the gap in the level of well-being of people.

So lifelong education is crucial, but at the same time, is the weakest link in the developed national educational systems.

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As hypotheses of research on the successful creation and improvement of the system of lifelong education in the digital economy, the authors state the following assumptions:

- In its content, form and functional derivatives, the external and internal continuity in the system "secondary school – higher school – work – pension" should contain digital conditions for the formation of students' activities and model the internal logic of its development;

- The development of research activities of students should be an integrated and prolonged educational process, accompanied by the formation of the subjective position of the future specialist;

- The educational space "secondary school-higher school-work-pension" should be represented in a single integrative educational system, including organizational-functional, logical-informative and personal subsystems.

-the backbone of lifelong education should be a university complex, which provides the structural and substantive integration of scientific, educational and other institutions.

## Literature Review

The digital economy is fundamentally changing the labor market: where a computer can replace a person, it will replace it. Self-employment is a way out for people who have lost their jobs, especially since digital technologies provide new opportunities for organizing and developing business. Thus, the concept of lifelong education received an impulse for development a little more than 30 years ago and the last decade has been actively developing. The task of expanding access to continuing education is driven by the need to create a competitive and knowledge-based economy environment. Lifelong learning, among other things, contributes to the personal self-fulfillment and labor adaptation of the adult population, improves the quality of the human capital.

Furthermore, in the near future, a regular change of profession will become the norm, although even being in the same professional field will require receptiveness to education more and more. The concept of continuing education assumes that a person's life is not strictly divided into a period of study (before graduation) and work, and learning is an ongoing process throughout life.

Universities should seek ways for maintaining their competitiveness by best preparing students for the real world. Yesterday, in the industrial economy, the effective solution of this task was a list of the curriculum that universities taught their students. However, today, in the conditions of a digitized economy, such training, based on fundamental knowledge, is no longer enough. Therefore, the best universities can give their students today is to teach them continuously learn, to interest them in the lifelong process of education and self-education.

Today, students' willingness for life in the real world is determined by their readiness for a continuous process of education, throughout their careers; their preparedness for the continuous process of self-reequipping. Otherwise, without giving priority to education and self-education, a person becomes obsolete as quickly as high technology.

Therefore, in a rapidly changing digitized world, only those organizations that care about involving their staff in a continuous education process are competitive. Thus, these organizations maintain up to date their ability to "take a digital wave", to adapt to market changes flexibly and quickly.

In order lifelong education to become the life norm, the structure of online education must evolve and the attitude of society towards learning should change. In addition, if the first task is directly related to the development of online platforms, software, content digitization, the second task is the development of a person's inner motivation to learn. As Kovalchuck's

research has shown, the main reason why adults do not go to learn new things is the lack of an internal need for it (Kovalchuck & Vorotnykova, 2017).

On the one hand, researches in Azerbaijan indicate a high level of provision of universities with personal computers and Internet access, and on the other hand, they demonstrate a lack of automation of administrative and educational processes of the university (Rzayev & Suleymanov, 2018). Despite the continuous development of technologies and the emergence of new educational web services, as well as a long-term government policy on the formation of the information educational space, its potential is partially used by universities. Only a third of university students are trained using e-learning or distance learning technologies (Shirzadova, 2016). At the same time, non-state educational institutions provide most of the online educational services available to students (Shirzadova, 2016). In general, the share of online education in the market of educational services in Azerbaijan is small and amounts to 1.8% for higher education programs and 6.7% for additional professional education. 82% of students enrolled in programs with the exclusive use of e-learning are students of private universities (Shirzadova, 2016). The use of technology even in the blended learning format in addition to the IT infrastructure requires appropriate training of teachers and students.

However, a further impediment for participation in lifelong education is a lack of time (workload or family responsibilities). According to the authors, the realization of an individual approach to the organization of training and creation of a more flexible schedule for the possibility of combining work and study can stimulate the adult population to become more actively involved in learning and education.

But basic or fundamental skills are highlighted in almost all studies, which, as a rule, are laid in the early stages of educational processes. The development of basic skills serves as the foundation for the development of the required skills for lifelong learning. Generally, knowledge have always been the end product of education, but in the digital economy the demand for skills has acquired a systematic, massive and at the same time specific nature.

Skills have a direct connection with the work position and workplace. Otherwise, they do not make sense. In view of the high dynamics of the processes of the digital economy, today the skills are characterized by the dynamics of their lifetime, tied to the life cycle of the workplace, and this distinguishes them from the "petrified" competencies. Therefore, the formation of specific skills should be carried out, firstly, as soon as possible while they are still relevant, and, secondly, given the fact that they can adapt to new conditions and develop.

Further, another factor that we call polydisciplinary of experience is that the content of skills can cover several different convergent subject areas, which naturally makes it difficult to learn these skills. For the development of such skills, the university environment seems to be very suitable, which is very fruitful for interdisciplinary research and development.

The next factor is the rapid development of the workplace ecosystem, the increase in the volume of scientific and technical information associated with the labor functions, the emergence of fundamentally new ways of working (Evans & Haffenden, 1988). All this requires constant updating of complementary skills.

It is also necessary to mention the factors of mobility and competitiveness of skills, which, as a rule, will be combined in a virtual space to solve common problems, bypassing administrative and international boundaries.

Finally, authors note the factor of the increasing role of international standards, the comprehensive system of which is being formed by the world community (Kupriyanovskiy et al, 2017).

In the framework of basic skills, the entire spectrum of digital experience that make up digital literacy is shaped.

Digital literacy is the ability to create and use content lading with digital technologies, including computer programming skills, searching and sharing information, and

communicating with other people. There are different criteria for the development of digital literacy. For example, Henry Jenkins believes that digital literacy includes the ability to work with a hardware (human interaction with a digital technology), an understanding the features of the device and the ways of dissemination of digital information (that is, the ability to work with software), an awareness of network community and social media features (Jenkins, 2006).

Doug Belshow singles out eight elements of digital literacy, including an understanding of the cultural context of the Internet environment, the ability of communicating in online communities, the ability of creating and distributing content, skills for using digital technologies for self-development (Belshaw, 2012).

Authors of various digital literacy concepts agree on one thing: only understanding how digital reality works can teach a person to control "information noise" and make interaction with digital technologies into a source of development, but not stress.

## Methods

The aim of the research is seeking new approaches to boosting the growth of the educational (general and professional) potential of an individual throughout life in the framework of using the system of state and public institutions and in accordance with the needs of the individual and society, as well as ways of using modern digital and educational technologies to meet the needs in the digital age.

The objective of the presented research is to assess the continuity of education in Azerbaijan in the conditions of a developing digital economy based on modern methods and results of theoretical and statistical researches.

The work is performed within the framework of the methodology proposed by the World Bank, which includes an assessment of five groups of indicators: the continuity of the use of information technology in the educational process; training of teachers for the use of information technology in education; informatization of education management; higher education information infrastructure; regulatory support of digitalization of education. The factual basis of the study is data from official statistics and universities (Fantom & Serajuddin, 2016).

The solution of a wide range of tasks in the process of forming high-quality lifelong education under universal digitalization should be based on the principle of connectedness. Thus, analysis techniques of this research allow combining the entire educational structure into a common, usable cascade digital circuit with the necessary degree of aggregation and detailing.

## Lifelong Professional Education in the Context of the Digital Economy of Azerbaijan

The observed growth in demand for digital literacy once again emphasizes the profound transformation of society from the industrial structure of society to a society based on knowledge, and in the result the knowledge becomes the main asset and must be continuously regenerated through training and production. Employees in the digital economy should be able to create and process complex information; think systematically and critically; make decisions on a multi-criteria basis; understand the essence of the ongoing processes of a multidisciplinary nature; be adaptive and flexible to new information; be creative; be able to identify and solve real problems of the digital world. But the digitalization of the education system cannot be limited by creating a digital copy of familiar textbooks, digitizing documents and providing all schools with access to high-speed Internet.

"The National Strategy for the Development of the Information Society in Azerbaijan for 2014-2020" (http://www.mincom.gov.az/upload/files/7127fa87906a4d9af22415aaac9b16ae.PDF) along with the existing concepts of "information society", "knowledge society" introduces the concepts of "digital economy", "ecosystem of digital economy". Inevitably, new terms appear in education, for example, digital education and lifelong education. A disseminated interpretation of lifelong education is the process of learning the necessary competitive competencies, preparing human capital for the digital economy. Analogy with generally accepted categories such as "technical education", "economic education", "medical education", etc. is hampered, as there is no clear selection of the subject area for lifelong learning.

Later authors consider the basic direction that affects personnel and lifelong education in the context of development of digital economy of Azerbaijan. The field of education has always been and remains a key element in the global competition of states for economic power and political influence. The "State Strategy for the Development of Education in the Republic of Azerbaijan" (https://edu.gov.az/ru/page/69) defined goals and objectives, the solution of which is a necessary condition for Azerbaijan to remain a full-fledged, independent and respected member of the world community.

Along with the above, there is a need to implement new steps to ensure that the education system in the rapidly modernizing Azerbaijan Republic meets the challenges of human capital development, bringing the quality indicators of general education in line with European standards. To improve the quality of education, the restructuring of the education management system and the development of human resources in this area are necessary.

In the conditions of the digital economy formation, the authors propose the following directions for the improvement of personnel in education:

1. The scheme of certification of personnel competencies in terms of continuity of education should be variable and consistent with professional educational standards, the national qualifications system.

2. The system of basic educational programs should ensure digital literacy of the population, training for the digital economy and use its tools and environments.

3. A lifelong education strategy, retraining, advanced training and involvement in the digital economy of public servants over 50 years of age should be implemented.

**Suggestions**

In the context of the rapid acceleration of changes in the markets of technologies and professions, the lag in lifelong education threatens a serious slowdown in the development of the Azerbaijani economy, a decrease in the investment attractiveness of regions and cities. Further, we offer some proposals for the development of the continuing education market - by stimulating both demand and supply with ensuring quality assurance:

- providing every citizen of working age with the opportunity to undergo retraining or advanced training;
- the formation of methodically and technologically equipped adult education centers on the basis of multidisciplinary colleges and universities;
- creation and support of a unified national electronic platform - a navigator of educational programs and employment services;
- development of a competitive and independent infrastructure for confirming the recognition of qualifications obtained remotely.

To achieve these goals, it is necessary to create a system of descriptions of continuous competencies of the digital economy, integrated into the national system of qualifications,

interrelated with professional and educational standards. This includes the mandatory creation of a regulatory framework or the "Digital Labor Code" and infrastructure for continuous, flexible, distance employment.

Next comes the problem of personal digital recording of the continuous development of citizens, including the recording of labor and educational processes. To this end, it is necessary to develop and introduce alternative certification systems of "adult education" that are adequate to the tasks of the digital economy. The introduction of the system of lifelong education includes the improvement of additional education.

The goal of lifelong education is not only to teach a person all his life, but also a motivation of teaching himself. Many scientists believe that the formation of stimulating environment should begin as early as elementary school, taking into account the physiological and mental characteristics of a child's age (Boonloy, 2018). Future changes cannot but influence the educational sector at the initial level, therefore one of the directions should be personnel and program changes in general educational organizations for children.

## Discussions

Continuing education is a holistic process consisting of sequential stages of specially organized educational activities that create favorable living conditions. Nevertheless, at present, lifelong education in Azerbaijan is still not treated as a unified system of state and public educational institutions, which ensure organizational, meaningful cohesion and consistency of all levels of education.

Life has its own requirements - developing the ability of a person to quickly respond to all changes, take initiative, expanding communication skills, etc. According to statistics from Azerbaijan, only 97% of university students are under the age of 25 (Silova, Johnson, & Heyneman, 2007). The rest of the population is adults, burdened with family and business concerns, who have either completed their formal training or those who were unable to complete their education. The system of continuous education in Azerbaijan does not meet the requirements of modern life, especially if we consider not only transport costs, but also the costs of organizing the entire system of full-time study. We have been able to observe the growing interest in full-time education with elements of distance education technologies, or, in general, the learning in full distance format. The use of technology even in the blended learning format in addition to the IT infrastructure requires appropriate training of teachers and students. The training of teachers for the use of IT in education, including teaching directly to work with IT themselves, should be complemented by training in methodical work in the information educational space (Shabanov & Quliyev, 201).

Despite the positive changes in providing the country's educational institutions with computer equipment, in general, the level of information infrastructure of the education system is far from being perfect. Over the past 3 years in general education schools, 12232 teachers have completed special preparatory courses on ICT, which are only 7% of the teaching staff. Over the past 5 years, out of 12,367 people of the teaching staff of higher educational institutions, 391 people (3.2%) completed special training courses in ICT, the indicator for the specialized secondary schools was 90 (1.3%).

As a result of the study, we present our conclusions on the correspondence of the real situation in Azerbaijan to the five assessments proposed by the World Bank:

1.       The experience of using information technologies in education is just beginning to accumulate. Computer illiteracy is the main problem that concerns not only Azerbaijan, but also other countries – knowledge about the technical components of a computer, the ability to work with different interfaces, the use of all device capabilities, awareness of the role of computer security.

2.      Azerbaijan has not yet developed standards in the field of ICT ownership and monitoring and certification of ICT competence of teachers, despite the fact that the formation of ICT competence of future teachers has become one of the most important problems of teacher education.

3.      Informatization of education ensures the development of innovative knowledge and its practical implementation. Azerbaijan still lags behind in its own design and engineering

4.      new types of educational materials that implement various types of students' educational activities (including those with disabilities) using ICT.

5.      New structural divisions (educational information laboratories, resource centers, educational and methodological rooms) appear in national universities, whose activities are aimed at providing students with open access to educational Internet resources. We note with regret that sometimes the activities of national universities is reduced to technical servicing support for the work of faculties, and not to the modern organization of training and methodological support of educational process.

6.      The legislation of Azerbaijan regarding education does not contain provisions on digitalization or digital transformation of the education sector as a whole. The legal barriers at the level of education legislation include an orientation towards traditional information support and the lack of legal regulation of the use of breakthrough digital technologies in education.

## Conclusion

The transition of the Azerbaijani economy to an innovative development path requires the introduction in this area, in addition to traditional non-technological innovations (organizational and managerial, product, etc.), new technologies that change the usual routine activities of staff. Learning new skills should become the norm for those doing routine work. Independent study is the main thing that needs to be learned now. According to the assessment proposed by the World Bank, the current situation with lifelong education in Azerbaijan does not fully meet the requirements of foreign experience in regulating this area, despite the widespread introduction of digital educational tools. Due to the lack of a systematic approach to the implementation of lifelong education, systemic changes are substituted for short-term ones.

Summing up the research, we can say that in terms of automation of various production processes, which led to the complete or partial disappearance of a number of specialties, as well as a massive shortage of specialists with digital knowledge, skills, and abilities, Azerbaijani educational infrastructure should be adapted to new requirements. In the education system, it is necessary to develop and introduce fundamentally new approaches to learning, which will ensure a high level of basic digital literacy of the population. To solve such ambitious tasks, first of all, personnel who possess distinctive social and professional characteristics are necessary. In the information age, the teachers of educational institutions must adapt to the possibilities and limitations of the digital economy, use its benefits on a daily basis and feel comfortable when faced with the digital shock of the future, learning continuously throughout life. On the other hand, the teacher must act as a citizen who interacts responsibly with digital government, digital media, and as an employee with the necessary competencies for effective and continuous activity in the digital economy (including the field of culture and research), using activities in the digital environment and digital tools as a learner and professional.

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