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COMPARISON OF DISTANCE EDUCATION AND SMART EDUCATION
COMPARAÇÃO DE EDUCAÇÃO À DISTÂNCIA E EDUCAÇÃO INTELIGENTE
COMPARACIÓN DE EDUCACIÓN A DISTANCIA Y EDUCACIÓN INTELIGENTE

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Abstract: In the context of the pandemic caused by the spread of COVID-19, the problems of organizing the educational process based on digital technologies came to the fore, and therefore close attention was paid to distance education. At the same time, to optimize the educational process, questions arise about the use of smart technologies. In this regard, there is often a replacement of concepts such as distance education and smart education. Smart education is often viewed as a form of distance education based on communication and information technology. The article compares two educational systems: distance education and smart education. As a result of the analysis, the main positions were identified that showed the integrity of each of the educational systems under consideration.

Keywords: Distance education, Smart education, Individual learning, Personal individual learning.

Resumo: No contexto da pandemia provocada pela disseminação do COVID-19, surgiram os problemas de organização do processo educacional com base nas tecnologias digitais e, portanto, grande atenção foi dada à educação a distância. Ao mesmo tempo, para otimizar o processo educacional, surgem dúvidas sobre o uso de tecnologias inteligentes. Nesse sentido, muitas vezes há uma substituição de conceitos como educação a distância e educação inteligente. A educação inteligente é frequentemente vista como uma forma de educação a distância baseada na comunicação e na tecnologia da informação. O artigo compara dois sistemas educacionais: educação a distância e educação inteligente. Como resultado da análise, foram identificados os principais posicionamentos que evidenciam a integridade de cada um dos sistemas educacionais considerados.

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Palavras-chave: educação a distância, educação inteligente, aprendizagem individual, aprendizagem pessoal individual.

Resumen: En el contexto de la pandemia provocada por la propagación del COVID-19, los problemas de organización del proceso educativo a partir de tecnologías digitales salieron a la luz, por lo que se prestó especial atención a la educación a distancia. Al mismo tiempo, para optimizar el proceso educativo, surgen interrogantes sobre el uso de tecnologías inteligentes. En este sentido, suele haber una sustitución de conceptos como la educación a distancia y la educación inteligente. La educación inteligente a menudo se considera una forma de educación a distancia basada en la tecnología de la información y la comunicación. El artículo compara dos sistemas educativos: educación a distancia y educación inteligente. Como resultado del análisis, se identificaron las principales posiciones que evidenciaron la integridad de cada uno de los sistemas educativos considerados.

Palabras clave: educación a distancia, educación inteligente, aprendizaje individual, aprendizaje personal individual.

1 INTRODUCTION

Nowadays the attention of the scientific community is focused on the concepts of distance education and smart education. The main feature of the modern world is a high rhythm of life, when a person is in an "active" status for 24 hours. The high pace of life requires people to master and acquire new skills and knowledge without interrupting their main activities. The platform for organizing "open learning" is formed due to the high requirements for job seekers, rapidly changing technologies and ways of organizing work.

This term can be viewed from the point of view of «the philosophical construct that seeks to remove barriers and constraints that may prevent learners from accessing and succeeding in quality, lifelong education» (Gazette, Wallenstein, Heiman, 2009). Mostly, lifelong learning is made possible by the widespread adoption of distance education and the formation of smart education.

The close attention of the scientific community and the whole world to distance education is also associated with the spread of COVID-19, which forced all countries of the world to temporarily completely switch to distance learning. This experience has shown the disadvantages of distance learning that exist in Russia, in particular, interruptions in the work of both the Internet in general and educational online platforms in particular (Shcherbakova, 2020). Leading universities in the world have also faced difficulties in the transition to this form of education: «Even when students have laptops or tablets, the social and knowledge relations of learning have not changed much.

Often, teachers still stand and talk from the front of the room. Curricula still shovel out content» (Cope, Kalantzis, 2020).

However, it was precisely this situation that caused the "digital shift in education" (Falkov, 2020). The digitalization of education will inevitably accrue, creating a completely new virtual educational environment. Such an environment will dictate the conditions for organizing the educational process. To navigate in this environment, it will be necessary to use smart technologies that build structural connections in various processes of educational activity. Thus, Smart Education will inevitably be formed.

The discussion about the formation of Smart Education is widespread in the scientific community, but it is often equated with distance education based on digital technologies. In our understanding, Smart Education is a new educational paradigm that is based on the aspects of distance education.

The aim of the research is attempt to demarcate forms of distance education and smart education by identifying the similarities and differences in their goals and characteristics, as well as in the aspects of the organization of the educational process.

METHODOLOGY

In this article we consider distance education as a special system, a social institution. It determined the framework of our research. In this regard, distance education is a specific, technologically modernized (using modern means of communication and computer technologies), unified with national educational traditions and state educational standards form of organizing the educational space, in which there are restrictions related to the place and time of learning have been lifted (Polozhentseva, 2016).

The beginning of distance education dates back to the 18th century (1728) (Kentnor, 2015), in this regard, the learning process has undergone significant changes.

There are three generations of distance education:

1 - through printed materials and communication by mail or telephone

2 - through audiobooks, radio and television broadcasts

3 - through interactive communication: interactive videos, email, chat and other web technologies.

Turning to smart education is a completely new phenomenon that is just beginning to look for ways to become and transform into a system with a social character. Nowadays, it is often compared or equated with distance education based on online learning. But, in our opinion, smart education should be seen as a unique independent education system.

Basically, smart education came from Asia. The first intellectual education projects appeared at the end of the 20th century in Malaysia, and then similar projects focused on smart education began to appear in different countries. Scientists have not yet come to a common definition of smart education, because it is just forming. In our study, smart education will be viewed as the form of smart learning that is an intelligent, tailored instruction-learning supporting system, in which the demands of the 21st century information technology society are met with changes in the overall education system (pedagogy, curriculum, assessment, and teacher) (Park, Choi, Lee, 2013). It should be noted that this is based on a developed communication network environment.

We can see a significant difference in setting accents of mission of distance education and smart education, comparing their concepts. In the first case, the keywords are "lifting restrictions", which means the availability of education. It does not mean a complete rethinking of aspects of the educational process (pedagogy, curriculum, assessment, teacher's role), but simply their transfer or adaptation to new conditions.

In the second case, the words about changing aspects of the educational process for the needs of the digital society are key in defining smart education. Here there is a gap between the existing education system and the demand of society, in particular from employers. It shows the need to rethink the backbone and content aspects of the educational process, taking into account modern needs, in particular, the possibility of existence in digital and smart societies. «In the years ahead, digital fluency will become a prerequisite for obtaining jobs, participating meaningfully in society, and learning throughout a lifetime» (White, 2013).

2 RESEARCH RESULTS

The difference in the mission of distance education and smart education

The main purpose of distance education is «to provide **equal learning opportunities ...** through more active and widespread use of scientific and educational resources of leading

universities, institutes, academies, various types of training and retraining centers for branches of human activity» (Polozhentseva, 2016).

According to Zhu and He (2012), «the essence of smart education is **to create intelligent environments** by using smart technologies, so that smart pedagogies can be facilitated as to provide personalized learning services and empower learners, and thus talents of wisdom who have better value orientation, higher thinking quality, and stronger conduct ability could be fostered» (Zhu, He, 2012; Zhu, Yu, Riezebos, 2016).

Thus, distance education is a massive increase in the level of education of the population, and smart education is individual, personalized learning.

The specifics of distance education and smart education

The peculiarity of the difference between distance education and traditional education is **the creation of individual learning**, which contributes to the growth of independence and personal responsibility of "a person for the choice of a distance education program, the timing and quality of its ending" (Polozhentseva, 2016). Individual learning is demonstrated in the student's self-organization, in his ability to discipline and personal desire for lifelong education through professional development and the acquisition of new knowledge and competencies. Sociological researches confirm that thanks to this form of education, the skills of self-education (73.3%), planning and organization (61.2%), and time management (56%) develop to a greater extent (Zaborova, Glazkova, Markova, 2017).

Personalization of individual learning is becoming the peculiarity of smart education. We can see it most clearly in the social orientation of smart universities, which are primarily focused on «building of the individual education cards (Smart-card), organization of the efficient communication and collaboration in education, cooperation, application of design and game techniques, communication via social networks services, etc.» (Morze, Glazunova, 2013). In smart education, the use of educational technologies based on artificial intelligence is to "adapt" the learning program to the specifics of perception, the level of preparation, and interests of the student.

So, in distance education, individual learning is largely associated with the personal characteristics and qualities of the student, with their personal responsibility and motivation. Personal motivation is a major factor in successful completion of a learning: the higher it is, the more

likely it will complete the learning. In smart education, the motivating factor lies inside the building of the educational process, which is based on the individual preferences and characteristics of the student. Smart technologies make it possible to use the student's personal characteristics to motivate him to learn, so the motivational factor comes from the outside world, and not from the inside.

Differences in the aspects of organizing learning for distance education and smart education

Accessibility is the first aspect in organizing learning. Thanks to the development of information and communication technologies, distance learning has moved to a new level of its formation, namely in the field of e-learning or online learning. Gospodarik YU. notes that distance learning is an educational system “based on computer telecommunications with using modern pedagogical and information technologies, such as e-mail, television and the Internet” (Polozhentseva, 2016). Foreign literature is noted that currently “at least 80% of course content is delivered online" (Kentnor, 2015).

The new generation of distance education, based on interactive communication, provides a high quality and dynamic teaching method, not limited by time and place (Gazette, Wallenstein, Heiman, 2009). In many ways, these aspects are the main motivating factors when choosing distance education. For example, scientists from Ural State University of Economic and Ural Federal University conducted the research showed that the first three reasons for choosing an online professional learning course are the possibility of combining work and study (72%), receiving education at the place of residence (58.6%) and flexibility during learning (26.1%) (Zaborova, Glazkova, Markova, 2017). Thus, the main advantages of distance education are location independence and time flexibility.

Due to the fact that e-learning and online learning in distance education are based on the use of modern interactive communications and resources, it is in very similar to smart learning and there is difficult to find significant differences in it. But e-learning in distant education gives you access to a specific course and communities that exist in it permanently or temporarily. Smart learning involves the creation of a virtual environment or cloud that has access to a library of digital resources, textbooks and other educational resources, as well as access to massive open online courses. Virtual cloud education services are also focused on providing e-learning, but within the framework of smart education, it acquires such characteristics as seamless learning, constant

updating and reproduction of educational content, and personalization of content for the student. It becomes possible due to the fact that the cloud-based intellectual educational system includes the following characteristics:

- «a cloud platform that provides an infrastructure for the realization of a cloud-based educational media service environment,
- a compatible file format that enables it to provide media content through various types of devices,
- an authoring tool that enables teachers to create various types of media content,
- a content viewer that displays different types of media on multiple platforms,
- an inference engine that provides students with individualized learning content,
- a security system that manages privileged user access and data encryption in the cloud for dependable educational content services» (Jeong, Kim, Yoo, 2013).

Thus, accessibility in distance education is mainly described by spatial and temporal characteristics, and in intellectual education - by technological and informational characteristics. In distance education, the student receives the set of knowledge and skills, combined in a certain course, in smart education - gets access to an open educational service with unlimited resources and logically structured updated material.

The role of the teacher and his competence is the second aspect in the organization of learning. Here «many traditional functions of a teacher "bearer of knowledge", an informant, an explanatory, a controller, who blames and "punishes" for non-fulfillment of requirements, etc., have been losing their significance» (Bilenko et al., 2020), since the development of distance education in the format of e-learning or online learning is largely associated with the digitalization of the educational process. The teacher is largely forced to focus on the needs of society, that is, what knowledge is relevant and necessary for students, and what is not. If a teacher doesn't follow current trends in the professional and educational fields, it's negatively affects the demand for educational courses and, consequently, the teacher.

In this regard, in distance education, learning programs are developed after analyzing the learning environment and are focused on specific target groups that determine general and

individual goals. The teacher's task is to provide students with standard and individual learning materials and accompany them with personal meetings and consultations (Ermakova, 2012). He becomes consultant and curator of study groups (Irgibaeva, 2014), where he is a methodologists-developer and specialist in methodological support of online courses, a network educator-curator, a developer of environments for working in team projects, a moderator of social educational networks, etc. (Bilenko et al., 2020). At the same time, the teacher must be well versed in their professional field, as well as be able to organize the work of students in an online environment. In this regard, he must have knowledge not only in his scientific field, but also in the field of information and communication environment, in particular about software products that provide knowledge transmission through the network and interaction with students, orientation in the information space (search and selection of information).

In Smart Education, the teacher continues to play the same role as in distance education. He stays to be a consultant-tutor for students, but at the same time, the requirements for his compliance with the educational smart environment are increase. To successfully manage smart learning, a teacher has to:

- to be effectiveness – he should be able to produce acceptable and desirable outcomes for students to satisfy their needs;
- to be efficiency – he should be cost aware in designing his courses;
- to be flexibility – he should be able to flexibly adjust the goal, methods and materials to students' immediate needs and relevantly react to unpredicted situations;
- to be engagement – he should be able to motivate his students to learn and successfully fulfil their learning aims and objectives;
- to be creativity and innovativeness – he should be able to make use of new resources, methods and technologies;
- to be adaptivity – he should be able to adapt to different situations and different students' learning styles; (Klimova, 2016)
- to be reflectiveness – he should be able to recognize successes and failures and learn from mistakes; acquire new knowledge and create new pedagogical methods;

- to feel compassion, i.e. maintain an emotional connection with students (Kayapinar, 2018).

Thus, the teacher remains a key figure in distance education and smart education. But in smart education he bears a large burden of responsibilities, which are diverse in nature: from creative (making learning programs) to technical (supporting students' work in the online space). At the same time, he himself must be very flexible and mobile, quickly navigate and adapt to a smart environment.

Interactivity is the third aspect in the organization of learning. Interactivity is seen as one of the key aspects of the continuity of e-learning (Coursaris, Sung, 2012), its effectiveness (Mahle, 2011), as well as immersion in learning. It means that «when interacting with a virtual environment, imagery processes come into play and, through imagery, individuals feel immersed in the environment and experience intrinsic enjoyment» (Rodríguez-Ardura, Meseguer-Artola, 2016).

Distance education was the first to master information and communication innovations for building the educational process. Initially, video content, audio content, and multimedia materials were used as forms of interactivity. This made it possible in many ways to adapt the traditional education system to distance learning. However, then, with the development of the Internet, innovative ways of organizing interactive work with students gradually began to be used in the form of online learning: intellectual interactive simulators, intellectual interactive laboratory seminars (Kostygov, Mukhin, Polyakova, 2011), hypermedia didactic materials, simulators, real-time communication and project video presentations (Prensky, 2011).

Distance education, absorbing innovative information technologies into the educational process, creates a platform for the formation and development of Smart education, which cannot be without a good information and technological basis. Distance education often tests new educational technologies that can later be actively used in Smart Education. In this case, the psychological aspect of interactivity, such as immersion in a virtual environment, plays an important role in the educational process. In this regard, digital pedagogy and gamification come to the fore, which allow the inclusion of psychological characteristics of «digital natives» (Prensky, 2011).

At the same time, smart education also has the form of face-to-face learning, where the teacher and students use smart technology in the classroom. «Smart classroom technology supports the professionalization of the teaching process, supporting teachers to better prepare and enrich their lectures and to react flexibly to the needs of students and conditions in classrooms, leading to

increased efficiency and better teaching performance» (Glasco, 2019). Here «classrooms are transformed into an immersive learning environment» (Glasco, 2019).

Smart learning focuses on improving training efficiency by personalizing learning. For this purpose, information technologies are being developed to collect and analyze data about students. For example, an intellectual interactive educational system is being developed that integrates with a smart watch application and a smartphone. This system allows teachers to formulate proposals for learning each student in real time, regulate the pace of learning. «The cloud-based analysis system provides intelligent learning advices, academic performance prediction and anomaly learning detection» (Liang et al., 2019).

Thus, innovative communication and information products used to implement the aspect of interactivity in education are tested in distance education and serve as a platform for smart education.

3 CONCLUSION

The study comparing distance education and smart education showed that these are separate educational systems with their own specifics. Therefore, these concepts cannot be used synonymously.

The key difference between these educational systems is their mission, in which the factors of accessibility and quality of education contrast. Distance education, focused on providing accessible education to a wider population, contrasts with smart education, focused on creating an entirely new educational environment to improve the quality of teaching and the level of education of students.

In this regard, the personal-motivational factors used to organize individual learning in distance education are moving into the external environment in smart education. Here these factors woven into the learning process that create a personalization of individual learning.

Consideration of distance education and smart education in the context of aspects of learning organization (accessibility, the role of the teacher and his competence, interactivity) showed their similarity, expressed in the accessibility of educational services and information, in the use of communication and information technologies to increase the attention of students, as well as in the role of a teacher as organizer-observer-controller. At the same time, the learning process

in smart education is completely built in a virtual environment: information, teaching materials are in a smart cloud, the learning process is built on the basis of smart technologies, the teacher not only organizes the learning process, but also actively controls the process of perception and absorption of information by students. This aspect of the teacher's responsibilities is absent in distance education, where he controls only the progress of students, and not the process of absorption of knowledge.

Thus,

- distance education is a system for approbation innovative communication and information technologies, for their further improvement and application in smart education;
- smart education is broader than distance education, as it includes classroom and online learning;
- smart education is largely based on the recognition of the individual characteristics of the student for the construction and coordination of the educational process, as well as for its control;

continuous smart learning provides continuous control over students, which does not exist in traditional education and distance education.

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