MODERN IT AS THE KEY TO CREATING A NEW FORMAT OF EDUCATION

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Summary

The level of education does not guarantee the necessary level of critical thinking, both individually and collectively. A modern person faces the problem of processing text and multimedia terabytes of information in the educational process, which does not affect the creativity and creative approach of a qualified specialist in solving the tasks set for the individual and society to solve. In addition, the large volumes of knowledge intensively acquired by those gaining education in our time overwork brain activity and lead to resistance to information overload. Now, the simpler the exchange format, the better. No one wants to work with large amounts of data, and it accumulates quickly in every field of knowledge. Few people think about the problem of connectedness of information, the trend of clip thinking is growing. That is, a person is deprived of opportunities and skills to understand and manipulate things more complex than one picture, comic or short video. Thus, the education system faces a dilemma: how to form the necessary level of professional competence in an individual and at the same time develop critical and systemic thinking, and not suppress his creative social activity by overloading with unnecessary information and knowledge. It is necessary to create conditions for solving the main problem of the post-information society, in which the level of education should be determined by the quality of the specialist's thinking, and not by the amount of knowledge acquired by him.

The article examines the trends that influence the change in the thinking of modern people through the prism of the creation of the latest format of education, taking into account the factors determined by the use of the latest information technologies in the design and development of educational platforms. The need to change educational information technologies in the education system and transition from "monolithic" educational technologies to flexible information technologies implemented in microservice architecture is substantiated.

Key words: type of thinking, temporal thinking, education, post-information society, educational information technologies.

1. Introduction

We can see the beneficial effects of education in many countries. The competent organization of education in the State creates human capital, which provides many advantages in the economy and in society. At the same time, from the point of view of an individual,

education increases the sense of self-worth and opens new horizons; while at the level of society in general, education ensures long-term economic growth, reduces the level of poverty, accelerates the introduction of innovations, strengthens State institutions and enhances social unity. However, the level of education does not guarantee the necessary level of critical thinking, both individually and collectively. Education does not guarantee creativity and a creative approach to solving the tasks set for the individual and society to solve. It can be said that in the beginning, quality education is an investment with long-term benefits, but in the future, the results of this process are unpredictable. Without the formation of critical thinking, the amount of knowledge that an individual receives can become the basis for political manipulation, which can carry critical risks to the existence of society.

Whoever thinks correctly, he solves his life tasks successfully. As the researches of the last decades show, in modern society such a type of thinking is being formed, which is characterized by a certain "temporal mixture" (M. Heidegger) and is directed to the future through the creation of an informational field of culture with the help of the development of priority social needs, creating a collective-spatial horizontal and cultural-time vertical.

2. Research analysis

The collective-spatial horizon unfolds in the field of objective social, natural and cultural markers through their manifestation in both external and meta-external (global) space. Such a dialectic of cultural-spatial relations is realized both through a homocentric type of thinking *(Easterling, 1961,38-153),* which focuses on satisfying human needs in accordance with the modernist interpretation of social progress, which is based on the latest technologies and is based on the growing exploitation of the planet's energy resources, and through temporal type of thinking *(Shipp, et. al. 2019 37-43),* in the center of which are individual and collective intelligence, which form the energy of human culture (V. I. Vernadskyi), according to the postmodern interpretation of social progress as an intellectual and technological construction of society. This way of thinking substantiates the need for new forms of the educational process, the choice of its trajectories and their control. The "secret" of the postmodern transition from a homocentric to a temporal type of thinking, which is becoming the dominant type of thinking in modern society, lies precisely in this unity of the collective spatial horizon and the individual-time vertical.

The temporal type of thinking singles out the peculiarities and diversity of forms of being, which is determined primarily by the factor of originality, which manifests itself in a special way in different cultures and different worlds. That's why the choice between tempoworlds is the most important choice for an individual in a postmodern society. It is this choice that determines the dialectic of modern education, which, thanks to the use of the latest technologies, is called to create a new platform for an individual approach to learning, taking into account all the needs of the personality of the postmodern era. The use of the latest technologies lays the basis for a special type of creative activity to create a new type of education (*Yevtushevskyy 2016, 62-66).*

The purpose of this study is to analyze the trends determined by the use of IT in creating the newest format of education, taking into account the factors affecting the change in the fundamentals of thinking of a modern person.

The problems of the relationship between the temporal type of thinking and education at a new stage of the development of human society were considered by a group of researchers under the leadership of Professor S. Papert (laboratory of the Massachusetts Institute of

Technology), as well as in a number of articles devoted to this issue. In particular, the work "How does information technology shape thinking?" *(Barzilai et. al., 2006, 130-145)* raises the question of the influence of IT on the strategy of higher-order thinking and the nature of the development of creative abilities of an individual, which can be proposed in the process of its formation in the conditions of a post-information society. In subsequent studies, the analysis of not only the impact of the latest technologies on the nature of the formation of temporal thinking *(Coulter, 2000, 23-25;10, 26-57)* but also the format of using digital platforms in the modern education system *(Krause, et. al., 2003)* was continued. The work of Maree A. "Skillen Using Information Technology to Promote Thinking" *(Maree, 2009)* examines the influence of various digital media and web solutions on the development of mental skills in the process of obtaining education and the specifics of their implementation in the educational environment.

However, despite the large number of scientific works, the issue of correlation of new educational tactics and strategies with regard to the needs of the individual in the post-information society remains unsolved and requires further research.

3. Thinking and strategy of education in the post-information society

As you know, in the industrial age, the main educational channel was the text and its interpretation by teachers. Large volumes of textual information were thoughtfully processed and under the influence of teachers, students formed their views on this or that problem. That is, there was a linear dependence of the volume of processed text, the intellectual level of society and its critical attitude to real life processes. The volume of information existing and generated by human activity did not exceed the possibilities of its analysis and processing. In addition, the very process of learning and using knowledge was also linear: school – general education, professional and higher education (technical school or university) and post-graduate education or advanced training courses.

Post-information society of the 21st century faced humanity with the problem of processing terabytes of information and the need, in addition to texts, to acquire information from other sources, which formed another type of resource, namely information one *(Glushkov, 1982)*.

At the same time, there is a reduction of communication channels between people to the level of information exchange through communication channels, in which case the collective form of communication is replaced by the modeling of this process by means of software. The same is done in the educational environment. The dominant form of distance education leads to changes in the forms and methods of acquiring knowledge by an individual. It seems to be a positive opportunity, on the one hand, to focus and intensify the educational process for each student, and on the other hand, there is an almost complete removal of empathic mechanisms of communication and transfer of personal information between people. Meanwhile, the objects and relations of the virtual world replace the material world, which threatens the loss of values and sensations of the realities of the surrounding world. The result of online education can be the encapsulation of the student's personal space with an egocentric interpretation of the world, which inhibits both the awareness of the information received by him from educational subjects and, in the future, his ability to cooperate as a professional in the production environment and will lead to a different interpretation of events and social relations. "Pumping" knowledge into the encapsulated space of the individual gives rise to an egocentric approach to solving tasks and creates conditions for the loss of collective work skills, the main feature of which is the ability to

listen and adjust one's point of view in accordance with the goals and current work of the team. These skills predetermine the efficient activity, the success of which stimulates creativity and, accordingly, allows finding and implementing innovative solutions. In addition, the large scope of knowledge intensively acquired by students in our time overworks brain activity and leads to resistance to information overload. Now, the simpler the exchange format, the better. The volume of information that needs to be analyzed is rapidly shrinking. No one wants to work with large amounts of data, and it accumulates quickly in every field of knowledge. No one gives himself a report on the connectedness of information, the trend of clip thinking is growing. That is, a person is deprived of opportunities and skills to understand and manipulate things more complex than a single picture, meme or short video. Difficulties arise in understanding and forming logical chains in the subject area, making associations, which are the beginning of personal creative thinking. Instead of the skills to think and choose information by oneself, including imaginative thinking in the process of processing and creative postprocessing of information, modern educated people increasingly use existing patterns and templates in the processes of understanding knowledge, which leads to the loss of critical perception of information and creativity.

Thus, the education system faces a dilemma: how to form the necessary level of professional competence in an individual and at the same time develop critical and systemic thinking, and not supress his creative social activity by overloading him with unnecessary information and knowledge. One of the options for solving this dilemma can be continuous learning (CL), in which planning of individual educational routes is carried out, which a person chooses on the basis of his preferences, opportunities and external social demands. Navigation along the trajectories of educational routes becomes the basis for forming the interaction of the participants of educational and educational-methodical processes in accordance with individual preferences, level of thinking and purposefulness of the individual.

Moreover, on this path, a person should be guided not only by the experience of teachers, parents and relatives, but also be equipped with "navigational" tools for a life-long journey in the educational space.

4. Specialized IT is a tool for overcoming the crisis in education

In the modern world, the information resource is "materialized" in the form of distributed and centralized databases and data banks, and knowledge bases, which are used for data storage and are the basis of information environments. The developed "off" and "on-line" communication network means of collective and individual access to these environments made it possible to expand the possibility of information resource circulation and increase the efficiency of its exploitation in society. In particular, in the field of education, an opportunity has appeared for the real creation of individual scientific-oriented Continuous Learning (CL), from the point of view of which education is the process of building routes in the information space. Navigating these routes is the basis of forming the interaction of participants in educational and educational-methodical processes in accordance with individual preferences, level of thinking and purposefulness of the individual.

Functionally, educational technologies of Continuous Learning are based on information technologies (IT) of such classes as intellectual, informational, pedagogical and managerial, which contain complex program and organizational complexes (methods, algorithms, mechanisms, regulations, methods) that are aimed at supporting the work of the educational institution or the educational routes and trajectories of each specific individual.

The use of modern IT for "off" and "on-line" training extends the opportunity for all those who wish to raise their professional level or receive a second education independently (without any coaching in the broadest meaning of the word). At the same time, the most attractive thing for the student is the individual approach to the process of presenting courses of educational disciplines and the orientation of the educational process to a time convenient for the student.

However, everything that is attractive in education with the involvement of information technologies puts forward additional requirements for the process of formation of both specialized information technology and the CL environment in matters of creating architecture and functional capabilities. At the same time, the creation of interfaces (workplaces) and tools for the user and organization, network interaction and system components between themselves and the database should take into account the cycle and sequence of educational and educational-methodical processes.

The specificity of the implementation of these technologies and their high-cost force the developers of systems and information-program as well as technical complexes intended for the development and use of various forms of education to direct their efforts in separate directions, in particular:

– creation of multi-level knowledge delivery systems;

– creation of means of multi-level control of knowledge;

– creation of tools and means for the formation of educational and teaching-methodical material;

– creation of means of communication and technical support for educational and educational-methodical processes;

– development of educational institution management systems;

– creation of libraries, archives and repositories of educational and teaching-methodical materials.

Within these directions, the following levels of implementation are distinguished:

– *software* – separate software tools or a package of programs for performing calculations or several functions. For example, the formation of the curriculum of the department or the distribution of the teaching load at the department, etc.;

– *system* – a hardware and software complex or a software and information complex intended for automating the activities of a person or units of an educational institution. For example, an electronic document management system, or an automated system for creating and modifying a class schedule, etc.;

– *technological* – intellectual, software, informational, technical, communication tools are designed to support the functioning and management of means and resources involved in the educational process.

Since the latest IT and information environments can support the multifaceted needs of modern education at a sufficient level, this leads to the fetishization of the education process. The reason for such phenomena is the often superficial understanding by the educational platforms' developers of the specifics of the using IT for the field of education, insufficient consideration of the mechanisms for automating individual educational processes, the lack of a comprehensive systemic view of the architecture of the created educational environments, as well as the lack of funds and time in the IT development process, which confirms the impossibility of creating effective educational platforms without involving new innovative approaches.

Since the needs of today's society require the formation of a multifaceted personality, which is able to be realized in various spheres of its practical activity, the formation of cognitive

skills of the individual, the ability to pose a problem and effectively solve it, is brought to the fore. In addition, it is necessary to possess a high emotional intelligence and so-called soft skills, a set of competencies that do not relate to professional knowledge and do not depend on the specifics of the work, but are important in the implementation of the career component. Thus, the formation of a temporal type of thinking, taking into account all the features of the modern educational process, is a primary issue when creating modern educational platforms with the involvement of the latest IT technologies.

The fight against the learning crisis and the insufficient development of hard and soft skills requires the identification of problem areas in the preparation of educational platforms and the elimination of identified shortcomings in the creation of specialized IT.

The IT developer, in turn, must take into account the scale of the project, the nature of data processing (distributed/centralized), the hierarchy of information flows, the technology of processing, storage and use of each type of resource accepted in the industry, and the ability of IT to adjust to work both with an individual user and with the group, that is, it is not only about scaling, but also the possibility of supporting specific subject-oriented modes of work in educational and educational-methodical processes and management of the educational institution. At the same time, it is necessary to solve the following main tasks: the transition from "paper" to "electronic" technology for supporting the educational, educational-methodological process and the process of managing the educational institution; creation of a single specialized technology of CL; improving the quality of education and management decisions due to the automation of certain non-cognitive processes in the activities of the educational institution; providing specialists of the educational institution with prompt access to centralized and distributed databases of corporate educational networks; use of social and professional Internet networks for the purpose of interaction with international educational communities; spread of the spectrum of technological possibilities and procedures, available only when using information technology (continuous monitoring of educational and educational-methodical processes, e-mail, collective creation and coordination of documents, etc.); ensuring and increasing the functional capacity of IT, which is used due to switching and connecting new services without reprogramming the IT core.

5. Conclusions and suggestions

It is worth noting that work on the creation of fragments of this latest technology started in 2019. The first step was the creation of an operational IT core prototype in 2020 (*Lefterov et. al., 2020)*. At this stage of development, the main attention was paid to the creation of software for the management and technological chain.

The functioning of the IT prototype is based on separate fragments of the following educational technologies, namely: management of educational and educational-methodical processes; supporting the process of building and implementing individual educational and career trajectories of a person, as a basis for permanent gaining education (educational process); visualization of educational trajectories on a geographical map (as a component of the educational and methodical process); creation of electronic document circulation; administration and service maintenance of the IT software and information base.

The development was continued in 2021 and issued as a separate package in the form of an online map for the coordination of educational programs for museum pedagogy. The map is connected to a navigation service for searching information and selecting localization objects:

by venue (localization object); by subject and categorical features; by the name of the object (by keywords); by geographical features (by the name of the districts of Kyiv or search object coordinates). Unfortunately, the lack of appropriate funding did not allow the work to be carried out in full, but the fragmented implementation of the elements of the new educational technology continues. In particular, in 2022, work on the creation of tools for evaluating educational trajectories continued (*Lefterov et. al.,2021*)

Thus, the analysis of trends that influence the formation of thought processes in the post-information society shows the need to change educational information technologies in the education system and conduct transition from "monolithic" educational technologies to flexible IT implemented in microservice architecture.

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