UDC 373.3/.5.016:5]:004

Olga Pinchuk, Oleksandra Sokolyuk
Institute of Information Technologies and Learning Tools of NAES of Ukraine, Kyiv, Ukraine

COGNITIVE ACTIVITY OF STUDENTS UNDER CONDITIONS OF DIGITAL TRANSFORMATION OF LEARNING ENVIRONMENT

Technological changes in science, economics and society lead to social, political and cultural changes. Changes in education, among other things, cause some contradictions: between the emergence of the latest technology, technology and the new generation of means for training, management and scientific research and late response of education managers to the choice, implementation and spread of innovation; between the need to develop a modern educational environment and the conservatism of leaders and pedagogical staff in the period of innovation transformations.

Based on the computer-technology platform of modern education, which acquires characteristics of open, there is a transformation of traditional learning environment into the environment of computer-mediate communication. This environment is characterized by use of distributed educational resources and infrastructures to support educational communities of different types.

We consider cognitive activity as an element of the overall learning process, which is a targeted, systematically organized, managed externally or students' individual interaction with the surrounding reality, the result of which is the mastery of scholarly knowledge and work methods at the level of reproduction or creativity. In the process of learning, cognition gets clear form in a special and unique to the person educational and cognitive activity, or learning.

The effectiveness of educational and cognitive activity of students in particular is determined by the new paradigm of education of the information society. The entire toolkit is changed, that allow evaluating and controlling educational and cognitive activity. ICT and ICN form new solutions that can influence basic processes in the educational system: formation and development of competencies, recording achievements, learning quality assessment, creating a positive motivation and promoting individual educational and cognitive activities. The article deals with research results of problems of organization of educational and cognitive students' activity and formation of their competencies in the context of transformational changes in the educational process caused by presentation of new technologies.

Keywords: cognitive activity, learning, learning (academic) environment, digital transformation, competencies, ICT.

1. INTRODUCTION

According to experts in the field of economics 4.0 and modern production [1], consumer trends as a reaction of progressive groups of society to social challenges, leading to changes in the culture of behaviour, in 2018 will increasingly focus on various aspects of consumer and technology interaction. A modern person watches changes in technology and is forced to adapt to them both at the workplace and in everyday life. The most noticeable are: evolution of customer interface, integration of devices, provision of access to software products, services and resources in the cloud. The speed of life leads to the gradual replacement of human labor with bots or

programs. Robotics in mass production, processing and use of large volumes of data, rapid updating of knowledge, availability of information and, at the same time, the difficulty of converting it into knowledge - these and other signs of the information age lead to the need to make self-education a necessary element of every person's life.

Technologies are crucial in routine problems solving. Internet of things should ensure compatibility between all devices and provide mobility. However, the experience of typical tasks solving does not help to find effective solutions. Progressive ideas are born in the man's learning process of the world at the intersection of disciplines. Consequently, in our opinion, in modern conditions, a person armed with skills of rapid adaptation, working with data, productive communication, which is characterized by flexibility of thinking, the ability to concentrate, analyse, make conclusions, is able to create its own product, is ahead.

Here are some examples, that we think, illustrate the rapid growth rate of transition in all areas of human life to digital technologies:

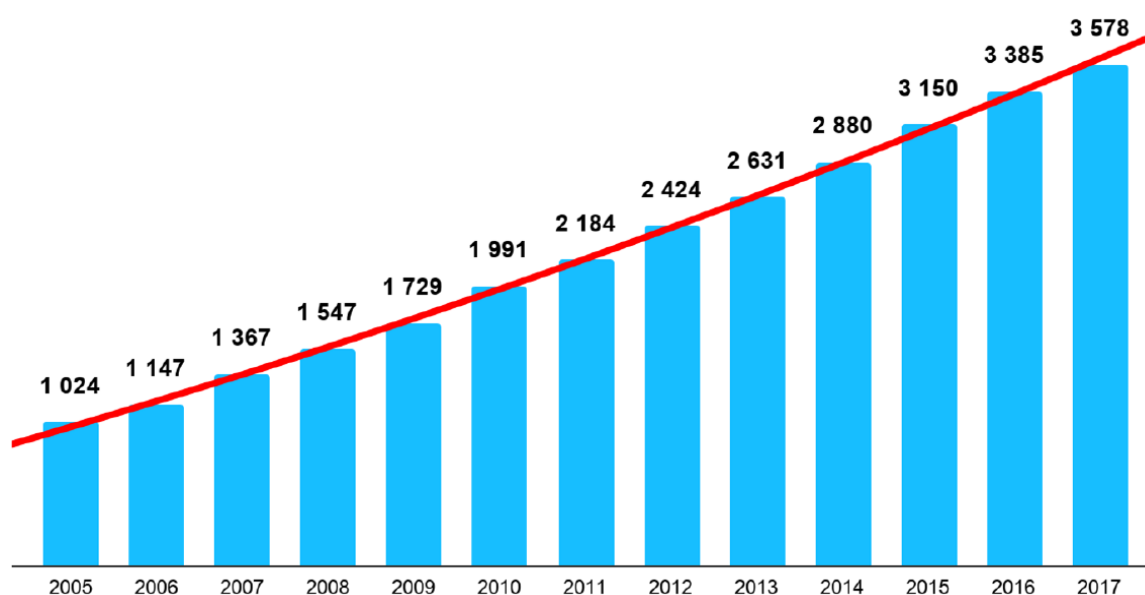The number of people on the planet using the Internet is rapidly increasing (Fig. 1).

Fig. 1. Number of people on Earth using the Internet according to data [2].

Moreover, according to results of long-term study of consumer trends of Ericsson, based on an online survey of 5141 primarily Internet users, 46% of respondents believe that the Internet allows you to acquire knowledge, skills and skills faster than ever before [1].

Growth is the tempo of digital communication between people. So, the number of e-mail accounts in the world is about 5 billion, mostly at the expense of private ones. During April 2017, the number of Facebook users, one of the most popular electronic social networks, exceeded 2 billion and since then has steadily increased. According to the company "Vhaschno" (https://vchasno.com.ua), which provides business services in docflow, storage and exchange of documents online appeared to be 70% cheaper than paper ones.

For example, in Ukraine, the official participant of the public procurement system ZAKUPKI.PROM.UA sent 316,100 documents per year, saving UAH 5,057,400.

At the beginning of 2018, with a total population of about 7.597 billion people, we have the following:

Table № 1.

A total population at the beginning of 2018

	Number of people bill	Percentage, %
Internet users	4,021	53
Active users of electronic social networks	3,196	42
Unique users of mobile devices	5,135	68
Active users of mobile services of social nets	2,958	39

Technological changes in science, economics and society lead to social, political and cultural changes. These changes cause new problems, the solution of which takes time. Social systems unavoidably experience periods of economic decline and growth while educational systems go through reforms. Changes in education, among other things, cause some contradictions. The following should be identified:

1. At the level of *the global information space:* between innovative updates of information and communications technologies as well as networking technologies from one side and the slow reaction of the state and the educational system to these trends on the other side.
2. At the level of *the national educational system:* between the emergence of the latest technology, technology and the new generation of means for training, management and scientific research and late response of education managers to the choice, implementation and spread of innovation.
3. At the level of *the educational institution:* between the need to develop a modern educational environment and the conservatism of leaders and pedagogical staff in the period of innovation transformations.

The dynamics of factors' development of external and internal environment directly affects the development of the innovative capacity of educational institutions and its implementation in the educational process. This requires a substantial transformation of the education system based on:

– psychological, pedagogical and didactic principles of digital education;
– new approaches to the selection of educational content;
– principles of flexibility and adaptability of pedagogical systems;
– principles of equal opportunities for all parties of the educational process;
– new forms, methods, technologies and means of teaching and learning that are implemented in modern educational environments.

We have analysed demographic trends, namely: proportion of so-called millennials (age from 20 to 40 years old) - the most productive population, teenagers and young people (from 10 to 19 years old) who will take jobs in a few years. Millennials make up 30% of the world's population (Fig. 2, a). Despite some differences in distribution, in Ukraine (Fig. 2, b), the proportion of the Millennials does not have any statistical difference (28.7%). The proportion of people aged 10-19 years to 16.1%. For Ukraine, this percentage is much lower - 9%. Among the features the Millennials obtain, psychologists mention: short-term concentration, pragmatic thinking, intelligibility in information, orientation on trends and social networks, extra-territorial activity (want to act "here and now").
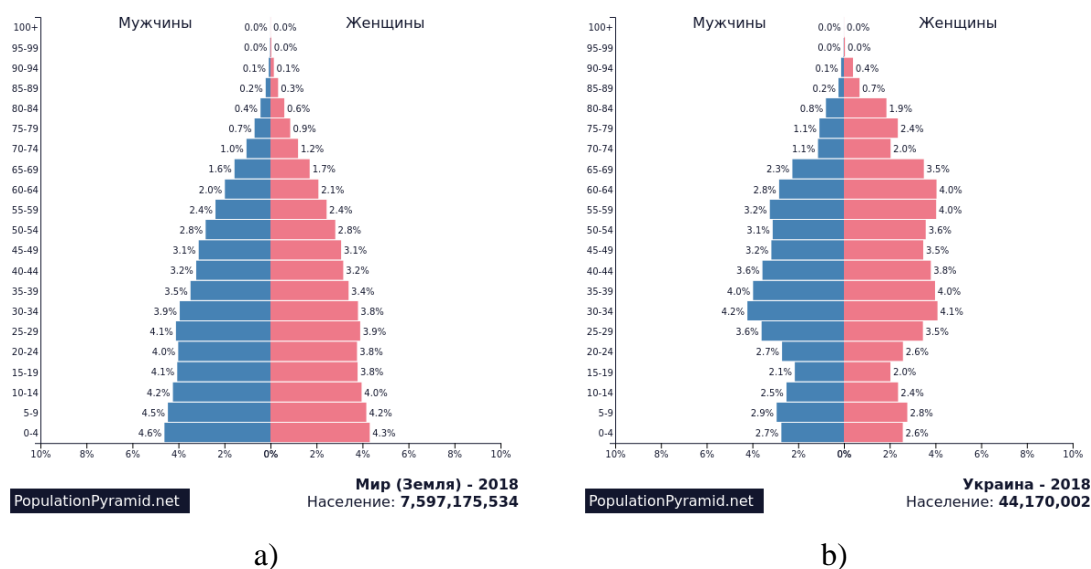
Fig. 2. Pyramid of world population (January 2018) a) in the world; b) in Ukraine

The next generation will live and work under somewhat different conditions, including: high level of automation for production processes, job cuts, competition in design of things, machine intelligence and 5G networks, rapid loss of actuality of acquired skills, etc. Transformation of society, primarily, will be associated with the development of new technologies. Information and communication technologies change the nature of relations within society, including within the sphere of education. These technologies cause a lot of changes in the economic, political, social and cultural spheres and, as a result, form new requirements for the field of education, laying the foundations of its new architecture. These bases include the results of the MEP-revolution in education (Harden, 2013); Virtualization and Gamemization of Education (Cocoran 2010, McGonigal, 2011); The new achievements of cognitive psychology (Robert L. Solso, Otto H. MacLin, 2005, M. Kimberly MacLin, 2013) and the possibility of their use for the formation and development of cognitive skills and abilities.

Global Education Futures Initiative connects the development of new education practices with active use in the educational process:

- unique approaches and access to carriers of key competencies;
- modern educational, in particular a digital, environment that supports the whole education / learning process, as well as the development of courses, interaction with communities, etc.;
- individual educational trajectory of each student (with possibility of full asynchronous education, with combination of educational process and extracurricular activities, with tutoring of this trajectory by mentors);
- flexible assessment system focused on supporting student's motivation;
- resources (students and teachers) for individual and group learning experiments;
- flexible architecture of educational institutions, which allows to realize a large number of educational formats for independent and group activities of students;
- horizontal education in communities, including the use of electronic networks;
- joint learning processes with real-life carriers.

Due to widespread use of mobile devices with access to the Internet there are changes in the organization of training. The boundaries between formal and informal education become less clear.

2. RELATED WORK

In previous studies, we analysed and compared new technologies, educational models, their impact on formation of learning environments, that are increasingly used in general education institutions, allowing us to address the issue of expanding student access to learning resources, and expanding opportunities for collaboration and cooperation [3]. In order to organise approaches to

formation of learning environment in which ICTs and the Internet are actively used, a comparative analysis of different models of learning environments has been conducted on the main features that characterize these models [4].

Problems of use of network technologies for conducting educational studies on natural sciences course in general secondary educational establishments, formation of system of knowledge by means of network technologies are studied [5].

Problems of projecting of informational and educational environment for the education of high school students on the basis of technologies of electronic social networks are investigated. The possibilities of using information and communication technologies and technologies of electronic social networks in the system of general secondary education are revealed [6]. The scientific and methodological foundations of formation of subject competences taking into account the basic principles of practical and personally oriented learning are proved. Forms and methods of studying which promote increase of formation level of pupils' subject competence are elicited. [7]. The problems of increasing information and communication competence of all participants of the educational process are looked into. Possible changes in the teaching method, when new objects appear in the system of learning tools - services of electronic social networks, are analysed. It is paid attention to change of emphasis from communication network to organization of productive discussion and collaboration with cooperative learning methods for students [8; 9].

The authors of the article revealed results of research on solving the current psychological and pedagogical problems of designing information and educational environment, different models of using electronic social networks in teaching senior students, development of certain elements of computer-oriented methodological systems, evaluation of educational process results in the open information and educational environment of training students and the critical problem of users' safety on the Internet, the formation and development of information and communication competencies of all participants of the educational process. A number of methods, related to: the formation of safe and responsible use of social networks and critical evaluation of Internet content; using electronic social networks to provide group interaction; organization of independent work of pupils (on an example of physics) and design and research activity of students (on an example of mathematics); prediction of aggressive behaviour of pupils; support for the education of disable children; the organization of informal education of youth are suggested. Much attention is paid to changing the emphasis from network communication to productive discussions creation, as well as from collaboration to cooperative learning methods [10].

3. RESEARCH METHODOLOGY

Currently, the Cabinet of Ministers of Ukraine approved the Concept of development of digital economy and society in Ukraine in 2018-2020. [11] In fact, this is a roadmap for digital transformation of Ukrainian economy. The document defines key policies, priority areas, initiatives and projects of "digitalization" of Ukraine for the next 3 years. In particular, this is "digitization of educational processes and stimulation of digital transformations in the education system".

The release of revised wording of key competencies for lifelong education coincided with the adoption of the Concept [12]. Mathematical competence and competence in science, technology and engineering (mathematical competence and competence in science, technology and engineering) and digital competence are determined as key[13].

The formation of above key competencies is possible on the basis of modern educational technologies using ICT tools, electronic educational resources, electronic social networks, which allow to reduce the educational load and simultaneously to intensify the educational process, in particular, from natural and mathematical disciplines, providing learning and cognitive activity with creative, research orientation.

Futhermore, opportunities for individualization and differentiation of training increase, opportunities for self-education skills form, metasubject and subject skills, ability to put the

knowledge into practice through the wide introduction into the interactive process of studying individual work of students are developed.

The means and technologies of the ICN, including the Internet, forming a computer-technological platform of educational, in particular learning environment of modern education, primarily open, transform the traditional educational environment into "an environment of computer-mediated communication - an integrated education and information environment with distributed educational resources and a communicative infrastructure of supporting educational communities of different types "[14].

It is understood that a considerable part of the didactically grounded and specially organized educational and cognitive activity of students is carried out on the Internet, has specific features [15], transforming into a modern form of training due to a number of factors.

Factor on e: The Internet is a network of information environment of modern society, and its role as a source of scientific and educational information is obvious. Factor two: a new generation of students takes the Internet not just as a social cultural phenomenon of our time, as well as parallel, often leading environment. Any activity in such environment, including an independent educational and cognitive, is taken by a young person with an interest, that increases the motivation for this type of activity. The Internet is becoming an informational environment for training and self-education. Factor three: Internet environment as an informational and informational and educational environment has a significant potential for self-development of the individual. Factor four: thanks to its unique properties (virtuality, turnover of operations, plurality of spaces, etc.), the Internet creates a comfortable environment of life that completes the internal and external space of an individual, and can act as a space of experiment.

From the didactic point of view, the logic of the learning process also changes. The traditional structure of learning process consists of the following steps: "getting information - understanding - memorization - reproduction - application (mostly by model)".

The modern structure is different: "getting information - understanding - application (creative) - analysis - evaluation - creation." It is this logic and structure of the process of educational and cognitive activity that underlies the system-activity and competence approaches and ensures dynamic activity of students.

Having agreed with the researchers (Belykov V., 1995; Slastenyn V., 2003) we define cognitive activity as an element of the holistic process of learning, which is a purposeful, systematically organized, managed external or independent interaction of a student with the surrounding reality, which results in mastering, on the level of reproduction or creativity, a system of scientific knowledge and ways of activity.

Cognitive activity is carried out throughout the life of a person, in all types of activities and social relationships, in particular, when students perform various subject-practical actions in educational process. However, only in the process of learning the cognition gets a clear form in a special, particular only for person, educational and cognitive activity.

Basic components of cognitive activity:
- content (knowledge, expressed in concepts or images of perception and conceptualisation);
- operational (various actions, operation of skills, techniques);
- resultative (new knowledge, methods of decision making, new social experience, ideas, views, abilities and personal features).

The main types of educational and cognitive activity of students in the Internet-oriented informational and educational environment include: search activity; practical development of new technologies; creating new content; Internet communication for cognitive purposes; learning using Internet resources.

Forms of educational and cognitive activity in the informational and educational environment are determined by the organization and / or self-organization of information and communication interaction and informative and cognitive activity of students. Formation and sustainable development of cognitive abilities of a person throughout his life is an indispensable element of any educational process.

4. RESULTS AND DISCUSSION

From the perspective of the modified taxonomy of Bloom, during the study we systematized the types of educational and cognitive activity of students in the Internet environment in accordance with the categories of cognitive processes (Fig. 3).
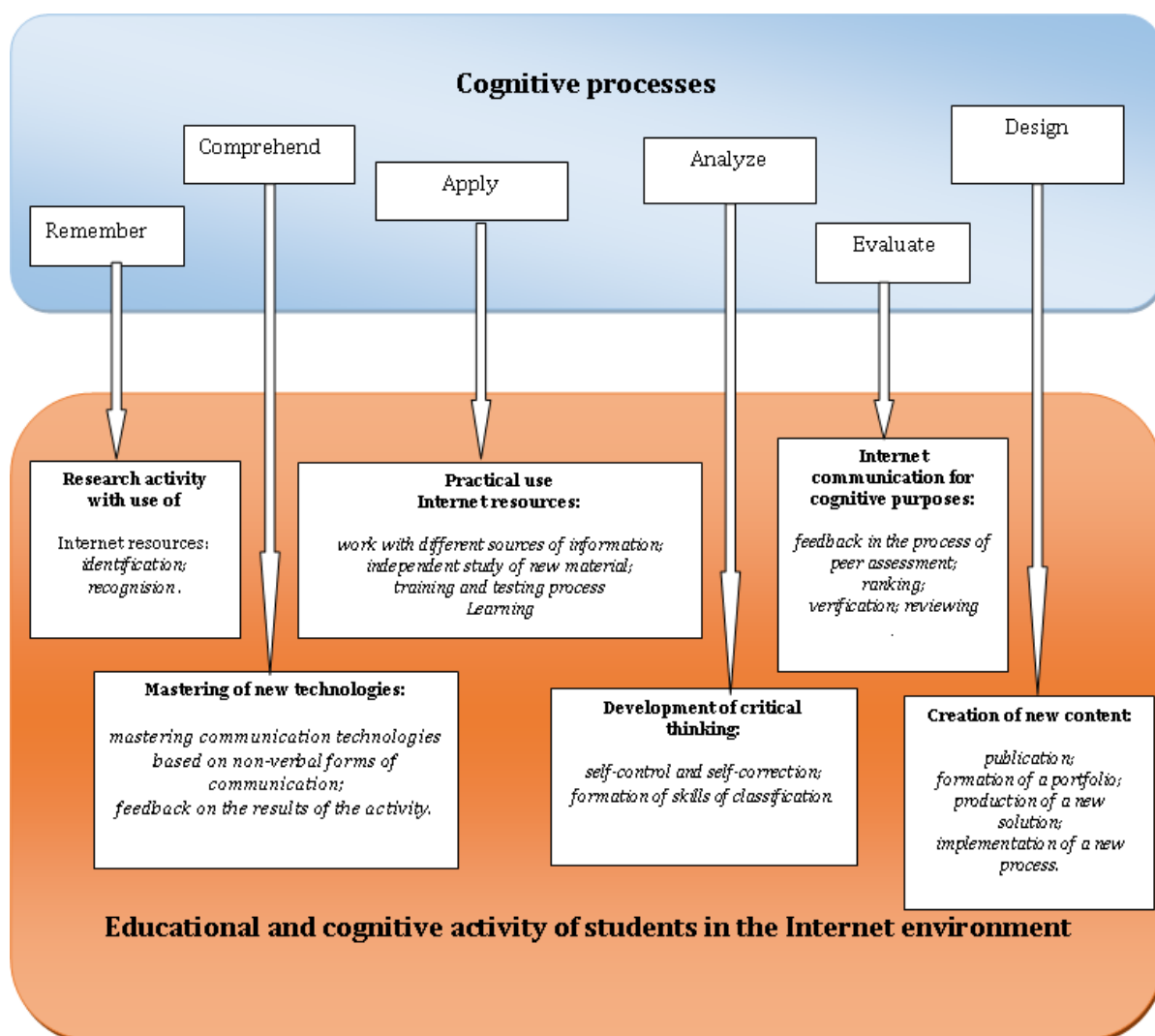

Fig. 3. Types of educational and cognitive activity.

Criteria, levels and other indicators of productivity of educational and cognitive activity in modern conditions are determined by the new paradigm of education of the information society. All the tools that make it possible to evaluate and control educational and cognitive activity get disturbed. The combination of information and communication technologies and means of communication networks form new solutions that can affect the basic processes in the educational system: the formation and development of competencies, fixing achievements, assessing the quality of learning, creating a positive motivation and promoting self-dependence in educational and cognitive activities. On the basis of such technologies, new educational instruments are offered [16].

The effectiveness of educational and cognitive activity of students is determined by the new paradigm of education of the information society. It recognizes all the tools that make it possible to carry out the educational and cognitive activity of the students, its evaluation and control.

- *Translation of reference experience or practice -* transfer of verbal knowledge (or self-studying), the transfer of non-verbal knowledge through communication with the carrier, the transfer of non-verbal knowledge through training skills. The tools include online

multimedia libraries, multi-user online courses, e-books, YouTube educational channels, subject blogs, virtual mentors, simulators, virtual simulators, and robot-mentors.

- *Independent getting of experience* through testing, research / experiment implementation, creative individual or group project. They are implemented in gaming environments, quests, in alternate reality, work-competitions, virtual laboratories, discussion scientific communities, social networks, and others.
- *Fixation and assessment of students' learning achievements* - testing, prognosis of educational trajectory based on the profile of achievements, end-to-end continuous monitoring (in particular, monitoring behaviour in the game forms within the alternate reality).
- Tools: personal competency profile, personal virtual portfolio, creation and stress test of the virtual world or digital model
- *Encouragement and motivation* of students for educational activities is carried out through: competitive gaming models (gamification), reputational capital management system, preventive outcome management (achievement prognosing systems), gaming adaptive models, state monitoring systems (which control the quality of experiences in the educational process).

5. CONCLUDING REMARKS AND FUTURE WORK

The transformation of modern society and education, particularly related to the development of new technologies, especially information and communications and networking. The digital transformation of education covers the creation of a modern computer-based environment that supports learning and self-education, creation of a system of informational and educational and game resources, flexible structure of educational institutions, which allows to fulfil a large number of educational formats and supports the advancement of students with individual educational trajectories, development of mechanisms of education in communities, including the use of electronic networks, formation of unique approaches to formation of key competencies , in particular digital one.

Formation of key competencies for lifelong education, including mathematical competence and competence in science, technology and engineering, is possible on the basis of modern educational technologies using ICT tools, electronic educational resources, electronic social networks, which allow to reduce the training load and, at the same time, to intensify the training the process, in particular, from science and mathematic disciplines, providing educational and cognitive activities with creative, research orientation.

The Internet environment as an informational as well as informational and educational environment has a significant potential for self-development of a personality due to peculiarities such as virtuality, turnover of operations, plurality of spaces, etc. It creates a comfortable environment for cognitive activity and can act as a space for an educational experiment.

The main types of educational and cognitive activity of students in the Internet-oriented informational and educational environment include: search activity; practical development of new technologies; creating new content; Internet communication for cognitive purposes; use of Internet resource for educational purposes.

From the perspective of the modified taxonomy of Bloom, during the study we systematized the types of educational and cognitive activity of students in the Internet environment in accordance with the categories of cognitive processes: remember, comprehend, apply, analyse, evaluate, design.

The revolution in digital content complicates separation of academically meaningful, scientifically grounded, truthful from false and, at times, dangerous. Individual training extends to new features. At the same time, the essence of the educational process and its quality survive little changes. According to the authors, there are approaches to change this state, in particular, learning related to real life; training in projects; free choice of training tools; reflection and a two-way evaluation of the result (for example, parents and teachers, teachers and students). We consider

further research in solving the problems of using digital simulations in the educational and cognitive activity of students to be relevant.

REFERENCES

1. Ericsson Comp. (2018). *10 Hot Consumer Trends 2018.* Retrieved from https://www.ericsson.com/en/trends-and-insights.
2. Vchasno, «Instant messaging service», Retrieved from https://vchasno.com.ua/.
3. Sokolyuk, O.M. (2017). *Information and educational environment in the conditions of transformation of education.* Science Notes. Series: Problems of Methodology of Physical-Mathematical and Technological Education, 12, 3, 48-55.
4. Pinchuk, O.P. & Sokolyuk, O.M. (2013). Individualization of the student's learning environment by means of the Internet. *Collection of scientific works of the Kamyanets-Podilsky National University named after Ivan Ogienko. Series: Pedagogical,* 19, 35-37.
5. Zhuk, Ju.O. (Ed.) (2014). *Internet Oriented Educational Technologies in School Teaching Experiment*. Kyiv: Atika.
6. Sokolyuk, O.M. (2016). Inclusion of social networking services in the existing model of organization of students' learning. *Information Technologies and Learning Tools*, 55, 5, 55-66. Retrieved from http://journal.iitta.gov.ua/index.php/itlt/article/view/1494/1088.
7. Pinchuk, O. (2018). *Formation of subject competencies of primary school students in the process of teaching physics through multimedia technologies*. PhD diss. (educat. sci.), National Pedagogical Dragomanov University, Kyiv.
8. Pinchuk, O. (2016). *Perspective analysis of use of electronic social networks in learning environment.* Proc. of 1st Workshop 3L-Person'16, Kyiv, Ukraine, June 21-24, 2016. Retrieved from http://ceur-ws.org/Vol-1614/paper_54.pdf.
9. Pinchuk, O. (2016). Perspective analysis of use of social networks as learning tools in learning environment. *Information Technologies and Learning Tools*,. 54, 4, 83-98.
10. Pinchuk, O. (2017). Developing of information and educational learning environment of senior students' training on the base of e-social networks *(final report).* Kyiv: Institute of Information Technologies and Learning Tools of the NAES of Ukraine. Retrieved from http://lib.iitta.gov.ua/709868/.
11. Cabinet of Ministers of Ukraine (2018). *On Approval of the Concept for the Development of the Digital Economy and Society of Ukraine for 2018-2020.* Retrieved from https://www.kmu.gov.ua/ua/npas/pro-shvalennya-koncepciyi-rozvitku-cifrovoyi-ekonomiki-ta-suspilstva-ukrayini-na-20182020-roki-ta-zatverdzhennya-planu-zahodiv-shodo-yiyi-realizaciyi.
12. European Commission (2018). *Proposal for a Council recommendation on Key Competences for Lifelong Learning. Brussels.* Retrieved from https://ec.europa.eu/education/sites/education/files/recommendation-key-competences-lifelong-learning.pdf.
13. European Commission (2018). *Annex to the Proposal for a Council Recommendation on Key Competences for Lifelong Learning*. Brussels. Retrieved from https://ec.europa.eu/education/sites/education/files/annex-recommendation-key-competences-lifelong-learning.pdf.
14. Rozyna, Y.N. (2005). Pedagogical computer-mediated communication as an applied area of commutative research. *Educational Technology & Society*, 8, 2, 257–264.
15. Raytskaia, L.K. (2013). Optimization of educational and cognitive activity of students in the Internet environment. Vestnik of Moscow State Institute of International Relations, 1, 18-21.
16. Global Education Futures (2013). *Global Education Futures: Agenda*. Retrieved from https://edu2035.org/files/GEF.Agenda2.pdf.

Пінчук О.П., Соколюк О.М.

Інститут інформаційних технологій і засобів навчання НАПН України, Київ, Україна

ПІЗНАВАЛЬНА ДІЯЛЬНІСТЬ УЧНІВ В УМОВАХ ЦИФРОВОГО ПЕРЕТВОРЕННЯ НАВЧАЛЬНОГО СЕРЕДОВИЩА

Технологічні зміни в науці, економіці та суспільстві призводять до соціальних, політичних та культурних змін. Зміни в освіті, крім іншого, викликають певні протиріччя: між появою новітніх технологій, технологій та засобів нового покоління для навчання, управління та наукових досліджень та пізньої реакції менеджерів освіти на вибір, впровадження та поширення інновацій; між необхідністю розвитку сучасного навчального середовища та консерватизму лідерів та педагогічних кадрів у період інноваційних перетворень.

Виходячи з комп'ютерно-технологічної платформи сучасної освіти, яка набуває особливостей відкритості, відбувається трансформація традиційного навчального середовища в середовище комп'ютерно-посередницького спілкування. Це середовище характеризується використанням розподілених освітніх ресурсів та інфраструктур для підтримки освітніх спільнот різних типів.

Ми розглядаємо пізнавальну активність як елемент загального навчального процесу, який є цілеспрямованим, систематизованим організованим, керованим зовнішньою або індивідуальною взаємодією учнів із навколишньою дійсністю, результатом чого є оволодіння науковими знаннями та методами роботи на рівні відтворення або творчість. У процесі навчання пізнання отримує зрозумілу форму в особливій і унікальній для людини освітньо-пізнавальній діяльності або навчанні.

Ефективність навчально-пізнавальної діяльності учнів зокрема визначається новою парадигмою освіти інформаційного суспільства. Повний інструментарій змінено, що дозволяє оцінювати та контролювати освітню та пізнавальну діяльність. ІКТ та ІКМ формують нові рішення, які можуть впливати на основні процеси в освітній системі: формування та розвиток компетенцій, облік досягнень, оцінювання якості навчання, створення позитивної мотивації та сприяння індивідуальним освітнім та пізнавальним діям. У статті розглянуто результати дослідження проблем організації освітньої та пізнавальної діяльності учнів та формування їх компетентності в контексті трансформаційних змін в освітньому процесі, зумовлених презентацією нових технологій.

Ключові слова: пізнавальна діяльність, навчання, навчальне середовище, цифрова трансформація, компетенції, ІКТ.

Пинчук О.П., Соколюк А.Н.

Институт информационных технологий и средств обучения НАПН Украины, Киев, Украина

ПОЗНАВАТЕЛЬНАЯ ДЕЯТЕЛЬНОСТЬ УЧАЩИХСЯ В УСЛОВИЯХ ЦИФРОВОГО ПРЕОБРОЗОВАНИЯ УЧЕБНОЙ СРЕДЫ

Технологические изменения в науке, экономике и обществе приводят к социальным, политическим и культурным изменениям. Изменения в образовании, помимо прочего, вызывают определенные противоречия: между появлением новейших технологий, технологий и средств нового поколения для обучения, управления и научных исследований и поздней реакции менеджеров образования на выбор, внедрение и распространение инноваций; между необходимостью развития современного учебного среды и консерватизма лидеров и педагогических кадров в период инновационных преобразований.

Исходя из компьютерно-технологической платформы современного образования, которая приобретает особенностей открытости, происходит трансформация традиционного учебного среды в среду компьютерно-посреднического общения. Это среда характеризуется использованием распределенных образовательных ресурсов и инфраструктур для поддержки образовательных сообществ различных типов.

Мы рассматриваем познавательную активность как элемент общего учебного процесса,

который является целенаправленным, систематизированным организованным, управляемым внешним или индивидуальным взаимодействием учащихся с окружающей действительностью, результатом чего является овладение научными знаниями и методами работы на уровне воспроизведения или творчества. В процессе обучения познание получает понятную форму в особой и уникальной для человека образовательно-познавательной деятельности или учебе.

Эффективность учебно-познавательной деятельности учащихся, в частности, определяется новой парадигмой образования информационного общества. Полный инструментарий изменен, что позволяет оценивать и контролировать образовательную и познавательную деятельность. ИКТ и ИКС формируют новые решения, которые могут влиять на основные процессы в образовательной системе: формирование и развитие компетенций, учет достижений, оценки качества обучения, создание положительной мотивации и содействие индивидуальным образовательным и познавательным действиям. В статье рассмотрены результаты исследования проблем организации образовательной и познавательной деятельности учащихся и формирования их компетентности в контексте трансформационных изменений в образовательном процессе, обусловленных презентацией новых технологий.

Ключевые слова: познавательная деятельность, обучение, учебная среда, цифровая трансформация, компетенции, ИКТ.