ISSN 2078-5526. Вісник Львівського університету.Серія педагогічна.2019. Випуск. 34. С. 13–22
Visnyk of Lviv University. Series Pedagogics. 2019. Issue. 34. P. 13–22

УДК 37:004
DOI: http://dx.doi.org/10.30970/vpe.2019.34.10569

EDUCATION IN THE FIELD OF NEW INFORMATION AND COMMUNICATION TECHNOLOGIES

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Together with the increasing access to the Internet, a new era has begun in the field of human communication, work, education, entertainment, the economy and other areas of human existence. The development of information techniques gives the opportunity to access a huge amount of information that is used to acquire knowledge in various fields of science. Thanks to new information technologies a modern educational space at all levels of education is changing. The virtual learning environment in a modern educational institution is based on meeting the educational needs of pupils and students. Satisfying these needs will be possible thanks to the IT competences of the student and the teacher. The state of preparation of the teaching staff for the use of multimedia and electronic educational resources, their readiness to introduce changes in the forms and methods of teaching, as well as computerization of Polish schools and access of educational institutions to specially prepared, safe electronic educational resources is also very important. The article also presents the problem of "digital school" as a synonym of a modern approach to the teaching process using multimedia, which allows to create equal educational opportunities for all children.

In order to show the role of new information and communication technologies in education, the following research questions were asked:

1. What is the share of new information and communication technologies in education?

2. What activities are being undertaken and what projects are being created to increase ICT participation in education?

To answer these questions, the methodological approach to pedagogical research adopted in pedagogy was used: critical analysis of literature.

The results of the research described in the literature on the subject of media education in the core curriculum, the base and offer of media education, forms of media education, the level of digitization in Polish schools, its diversity, both in terms of equipment and used solutions including media competences of teachers and students were analyzed.

Key words: new information and communication technologies in education, the level of digitization in Polish schools, media competence.

Introduction. The aim of the analyzes presented in this article was to organize the available knowledge about modern education at the level of primary,

secondary and higher education using new information technologies, and also to show the extent to which information technologies are used in education, because thanks to new information technologies modern educational space is changing at all teaching levels. The virtual learning environment in a modern educational institution is based on meeting the educational needs of pupils and students. Satisfying these needs will be possible thanks to the IT competences of the student and the teacher. The state of preparation of the teaching staff for the use of multimedia and electronic educational resources, their readiness to introduce changes in the forms and methods of teaching, as well as computerization of Polish schools and access of educational institutions to specially prepared, safe electronic educational resources is also very important. With the spread of the Internet, a new era has begun in the field of human communication, work, education, entertainment, the economy and other areas of human existence.

The school's community is composed of three generations. The first is the generation of people born in the second half of the 20th century, covering the years 1961–1983, called ***generation X*** [17, p. 52]. They got to know new information technologies in primary and secondary school, and some at work. The next ***generation Y*** in. ("Millennials", "digital generation") are people born in 1982–2004, growing up in the era of technology, innovations, the Internet and social media being in full bloom. Between the decline in popularity of the walkman and the birth of Google [12]. The generation of people born in the years 2005–2019 is the upcoming ***generation Z***, which few historical events still have in common. However, they associate the world with various political and economic turmoil (financial crisis, refugee crisis) [13]. This is the first generation that has become familiar with technology since birth. It is more skilled in using smartphones and tablets than their parents or older siblings.

Strong connections can be noticed between the spread of mobile communication and the creation of a new youth culture, language transformation, cultural changes in the field of organization of time and space, both by individuals and human teams. This generation also requires educational activities that use new information technologies in the teaching process.

Research shows that information and communication technologies (ICT) properly used in classes provoke students to think and solve problems in a new and innovative way.

Learning is deepened, strengthened and relevant when the technological and virtual space in which we learn provides:

- active and interactive participation;
- the possibility of team cooperation;
- searching and sharing information;
- discussion and presentation options;
- constructing knowledge;
- activities conducted by both the teacher and students;

- communication, access to experts;
- access to local and global networks;
- personalized learning mode [14, p. 45].

During education, it is important to assimilate values, which is why Internet researchers emphasize the importance of "creating educational opportunities by saturating the Internet space with values and helping students to build meanings" [16, p. 45].

New information technologies create an educational platform that includes *Google Earth, Mind Mapping, blogs, online resources, Picasa, and Podcast*. *Google Earth* program allows you to move to any place and display satellite images, maps, landforms, 3D buildings.

Mind Mapping – a special type of recording, according to its creators, to increase work efficiency and memory, as well as activate intuition thanks to the use of synergistic cooperation between both brain hemispheres [16, p. 45].

WebQuest – a type of project-oriented research method based on student instructions on the website. The starting source of information in the research of project participants is the Internet. Online sources can be supplemented with reference materials. *WebQuest's* form resembles a traditional project with elements of an e-learning course.

Picasa – a graphic file manager and viewer that allows organizing collections of digital photos and performing simple edits on them [9].

Podcast – a form of online sound or film publication, usually in the form of regular episodes, using RSS technology.

According to J. Morbitzer, one of the most important general tasks of modern education is to prepare students for the journey between worlds, i.e. in the area of the hybrid world, in particular to prepare them for difficult returns from the virtual world to the real one, since a return to reality is often a difficult decision, sometimes even forced by parents or guardians [12, p. 422].

Research questions and research method

In order to show the role of new information and communication technologies in education, the following research questions were asked:

1. What is the share of new information and communication technologies in education?

2. What activities are being undertaken and what projects are being created to increase ICT participation in education?

In answering these questions, the methodological approach to pedagogical research adopted in pedagogy was used: a critical analysis of literature and a diagnostic survey carried out in Wroclaw schools in May 2019.

The results of the research described in the literature on the subject of media education in the core curriculum, media education base and offer, forms of media education, the level of digitization in Polish schools, its diversity, both in terms of

equipment and solutions used, were analyzed, as well as media competences of teachers and students. Research was also conducted in 9 selected primary schools among 37 teachers.

Technological space of the school and learning. The demand for modern information technologies for use in education is creating new markets offering products that can be used in teaching. The annual Bett Fair is organized in London, gathering exhibitors from around the world offering technologies and services for the education sector. This year's edition of the Bett Fair was attended by about 850 exhibitors who held hundreds of stands at which equipment, auxiliary accessories and gadgets as well as programming solutions were presented. Among the latest technological trends, it is impossible to ignore the producers of various tools and applications that allow you to create and explore virtual reality, as well as combine these two worlds – created by nature and digital technologies.

The Bett exhibition was primarily addressed to school education participants: from kindergarten to the end of high school. A notable feature of many applications and solutions is the use of elements of play and fun, and the proposed technological solutions help to teach fun "at the occasion" [19, p. 24–29].

It is also worth mentioning methodological innovations noticed in discussions about modern education. Much space is devoted to innovations that meet the needs of young people in the field of game-based learning. The ARTe series of games by the American company Triseum for students of art history and cultural studies is an opportunity to learn not only the art of a certain era, but also the relationship between various social groups [2, p. 48–49].

Educational fairs are also organized in Poland, and one of the most important educational events took place this fall from October 3 to October 4 at the Congress Center of Targi Kielce. Experts gathered at the Congress Center of Targi Kielce presented solutions for didactics and teachers regarding, among others the use of new technologies and innovation in education. The educational offer is rich, but the question is whether it is used in schools.

So what is modern education like? First of all the contemporary education is personal. Based on the literature analysis, some trends in modern education can be distinguished:

- From class-lesson education to hybrid education (combining traditional classes with classes in virtual space, online broadcasts).
- From the model of classic didactics to edutainment.
- From education in the subject system to training of competences.
- Science closer to nature, i.e. learning about physical and natural phenomena in the natural surroundings of man.
- Personalization in education (individualization, student-focused education, individual learning paths, flexible program implementation, action on own initiative, independent prioritization).

- Learning (shaping students' learning to learn more, learning more effectively, becoming a better student).
- Process-oriented teaching (schemes for acquiring new knowledge).
- Individual learning style (theories describing the differences in the ways of obtaining and processing information).
- Student-oriented education (emphasis on the individual needs of each child).
- Personalized learning environment (the students choose educational materials themselves, plan their learning, develop issues, look for sources of knowledge and thus have full control over what, when and how they learn).
- Big Data and analytics (Developed and analyzed is extremely difficult, with a second situation and expression of valuable knowledge).
- Adaptive education (in Adaptive education it is assumed that the computer is able to improve the outcome of student learning. The platform, which collects data on user's behavior and effectiveness, enables the creation of a student profile, and then commissioning tasks that can be modified and which can be used to create later recommendations).
- Mobile education (means using mobile devices for educational purposes).
- Virtual mentor (Students from various parts of the world without leaving home have the opportunity to participate in activities conducted by outstanding personalities) [1, p. 4–35].

With the development of new technologies, the present-day school is changing, its information and education space must be based on meeting the educational needs of students, their expectations, offered programs and the availability of ICT tools. Information technologies are an opportunity for students with disabilities [10, p. 24–29].

The path to creating a dream school is lengthened and complicated primarily by restrictions arising from educational law, mostly affecting primarily public sector schools. These difficulties result from the fact that neither the school nor its social organs, i.e. the parents' council, have legal personality. The abovementioned difficulties arise primarily in financing operations and raising funds for this purpose; the principles' operability is inhibited by reducing them to the role of budget administrators, without any influence on its shape. A way to avoid this kind of difficulty can be to set up a non-governmental organization – a foundation or association, which can be for the school:

1. A legal and financial tool that legitimizes the activity (also a business one) of an organization which the existing educational law provisions for the public sector completely exclude.

2. An organizational tool for integrating the environment around a given school focused on the development of this educational institution [8].

Foundations and associations are founded to support activities related to the development of education in Poland. The most famous are Socrates II and Youth,

which coordinate the Lifelong Learning and Youth in Action programs. The eTwinning program, which enables schools from all European Union countries to contact and implement interesting educational projects using various information and communication techniques (ICT), conducts very extensive activities in the field of development of modern education.

The eTwinning portal is the main meeting place and work platform. It operates in thirty-five languages and, in addition to the virtual platform, offers free Internet tools enabling teachers to find cooperation partners and set up projects.

The extraordinary popularity of the portal in Poland is confirmed by the fact that 17,000 active teachers from Poland operate in eTwinning and conduct various educational projects [5, p. 32].

Another example of a popular project is the government's program to develop the competences of students and teachers in the use of information and communication technologies, the "Digital School", which consists of three basic components: e-school, i.e. equipping schools with modern equipment such as mobile computer labs; e-teacher, or teacher training; educational e-resources, i.e. creating textbooks [15].

Long-Term National Development Strategy – Poland 2030 is a document defining the main trends and directions of spatial development of the country, taking into account the principle of sustainable development, covering a period of at least 15 years. Digital Poland is envisaged in the Long-Term National Development Strategy Poland 2030, which involves building digital competence of learners, implementing universal digital education and creating a modern network infrastructure and educational resources [3].

From the above considerations it follows that there are plans for the digitization of schools and better equipped schools, so the question arises as to their implementation.

During the study, teachers were asked to indicate how often and in which way they use the possibilities of ICT when preparing for classes. Respondents were also asked to indicate the frequency of use ICT during classes. A detailed distribution of teacher statements is illustrated in the chart below.

Use of information and communication technologies in didactic work

Types of ICT / Frequency of use	Once a month	Once every two weeks	Once a week	Everyday	At all
Portals	6	4	4	2	21
e-textbooks	2	4	4	0	25
Interactive boards	8	5	3	2	19
Multimedia presentations	11	7	2	2	15
Educational videos	11	7	5	0	19
Educational programs	10	8	5	2	12

ISSN 2078-5526. Вісник Львівського університету. Серія педагогічна. 2019. Випуск 34

According to respondents' indications it is proved that the most frequently used form of work with the use of ICT is the projection of educational films and familiarizing students with new material using multimedia presentations for this purpose. The surveyed teachers who use new technologies in their didactic work stated that they use computers to draft outlines, supplement knowledge, acquire new materials, search for music or movie files, prepare presentations and prepare online lessons. The highest rate of people who never use ICT to prepare a lesson is noteworthy.

In addition, respondents who indicated that in their didactic work use the possibilities of ICT in this area were unable to indicate a specific example of the portal on the basis of which the whole lesson unit can be prepared.

Most often, teachers use Internet resources both to supplement their own knowledge and to obtain additional materials. However, they could not estimate the reliability of the portals from which they gain knowledge.

Research shows that only a few teachers use the Internet's opportunities to acquire teaching materials on a daily basis, which, however, are not sent to students. Teachers also do not use the communication potential of the Internet.

Equipping the school with information and communication technologies is the basis for their use in the teaching work of teachers. Purchases of computer equipment in the studied schools were mainly made to equip computer labs. The computers in the labs were desktop computers, which made it impossible to move them and made it difficult to use for teaching other than computer science classes. Admittedly, each equipped computer lab included the so-called a mobile multimedia set (a set consisting of a laptop computer and a video projector), but since it was only one such set for a computer lab, the possibilities of using it in lessons outside the computer lab were much limited.

Research results show that despite the fact that people who have already dealt with broadly defined modern technologies in their childhood and adolescence are entering the teaching profession, this does not translate into their use in teaching. Not all teachers had their own e-mail account, which, combined with a lack of competence in the use of information technology in the digital age can be safely called "digital exclusion". An indication of deficiencies in school equipment is most often a form of excuse for passivity, but they do not determine the complete exclusion of ICT from the teaching process.

The biggest problem for modern education is that teachers – digital immigrants – teach a population that speaks a completely new language.

Teachers have problems with understanding the virtual surface visible through the screen window sliding over it. They use the basic, standard functions of their mobile devices which are analogous to traditional ones. They treat new technologies with distrust.

However, students are born digital people who can imagine and understand virtual space.

They prefer free hypermedia access and parallel information processing. They discover all the functions of their devices and also invent new applications for them. They treat new technologies creatively and confidently. They also treat their own mobile devices as very personal items.

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Стаття: надійшла до редколегії 09.10.2019
доопрацьована 18.10.2019
прийнята до друку 25.10.2019

ОСВІТА В ГАЛУЗІ НОВИХ ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНИХ ТЕХНОЛОГІЙ

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Зі збільшенням доступу до Інтернету почалася нова ера в галузі людського спілкування, роботи, освіти, розваг, економіки та інших сферах людського існування. Розвиток інформаційних методик дає доступ до величезної кількості інформації, яку використовують для отримання знань у різних галузях науки. Сучасний освітній простір на всіх рівнях освіти змінюється завдяки новим інформаційним технологіям. Віртуальне навчальне середовище в сучасному навчальному закладі ґрунтується на задоволенні освітніх потреб учнів та студентів.

Задоволення цих потреб стане можливим завдяки ІТ-компетентності учня та викладача. Дуже важливим є рівень підготовки педагогічних кадрів до використання мультимедійних та електронних освітніх ресурсів, їх готовність до впровадження змін у формах та методах навчання, а також комп'ютеризація польських шкіл та доступ навчальних закладів до спеціально підготовлених, безпечних електронних освітніх ресурсів. У статті також показано проблему "цифрової школи" як синоніму сучасного підходу до навчального процесу з використанням мультимедіа, що дає можливість створити однакові можливості для всіх дітей.

Для того, щоб показати роль нових інформаційно-комунікаційних технологій в освіті, задано такі дослідницькі питання:

1. Яка частка нових інформаційно-комунікаційних технологій в освіті?

2. Які заходи проводять та які проекти створюються для підвищення участі ІКТ в освіті?

Відповідаючи на ці запитання, було використано методологічний підхід до педагогічного дослідження, прийнятий у педагогіці: критичний аналіз літератури.

Проаналізовано результати досліджень, описані в літературі на тему медіаосвіти в основній навчальній програмі, медіаосвітній базі та пропозиції, формах медіаосвіти, рівень оцифрування в польських школах, його різноманітність як щодо обладнання, так і застосовуваних рішень, компетентності викладачів та студентів.

Ключові слова: нові інформаційно-комунікаційні технології в освіті, рівень оцифрування в польських школах, медіакомпетентність.