

**INFORMATION AND COMMUNICATION TECHNOLOGIES:  
MODERNITY AND PROSPECTS  
OLENA LUSHCHYNSKA  
Ivan Franko National University of Lviv,  
(Ukraine)**

**ABSTRACT:** The article describes the concept of information and communication technologies. The advantages of using ICT in teaching activities are described. The reasons for the low level of ICT in modern education system are outlined. The author suggested ways to use ICT in teaching younger pupils as a means of activating and motivating teaching and learning activities.

**KEY WORDS:** information and communication technologies (ICT), younger pupils, teacher of primary school, primary school.

**URGENCY OF THE PROBLEM**

The process of entering a new computerized era has ended. Mankind has moved to a new stage of virtual communication, receiving, transmitting and processing information. Besides the usual, real world, a new, imaginary one, privileges of which do not leave aside not only the young, but also the older generation of users. Indeed, as noted Ken Robinson, in our own times, digital culture is changing the world just as profoundly as these earlier technologies have done. And the effects are cumulative. Radical innovations often interact with each other and generate entirely new patterns of behavior in the people who use them<sup>1</sup>. Changes in today's information society requires rethinking and improving approaches to the organization of educational process of primary education altogether and training of highly qualified teachers in particular. As noted by M. Kademiya, insufficient use of information technologies generally is associated with low information culture (IC) of society, ignorance about the opportunities of information technology, weak motivation of teachers and students to use information technology in education and careers<sup>2</sup>.

Information and communication technology (ICT) is a leading and indispensable tool for the functioning of many processes in all areas of society. The skills of free use of a computer – is not a requirement, but a necessity. To be a competitive professional one needs to change, to work and improve one's skills. Of course, all the existing modern information and communications technology are impossible to master and explore as they are constantly changed and updated. However, a person should be able to navigate the information flow, especially if you are a teacher. K.Robinson, believes that «current systems of education were not designed to meet the challenges we now face. They were developed to meet the needs of a former age. Reform is not enough: they need to be transformed»<sup>3</sup>. With this in mind, we need to move with the times, because the forms, methods and means used a hundred, fifty or

---

<sup>1</sup>Robinson K. Out of our minds: learning to be creative [Online resource] / KenRobinson. – 2011. – Link: <https://www.amazon.com/Out-Our-Minds-Learning-Creative/dp/1907312471>.

<sup>2</sup>Kademiya M. Y., Shakhina I. Y. Informatsiyno-komunikatsiyni tekhnolohiyi v navchalnomu protsesi : Navchalnyy posibnyk / Kademiya M. Y., Shakhina I. Y. / – Vinnytsya, «Planer» Ltd. - 2011. – p. 12

<sup>3</sup>Robinson K. Out of our minds: learning to be creative [Online resource] / KenRobinson. – 2011. – Link: <https://www.amazon.com/Out-Our-Minds-Learning-Creative/dp/1907312471>.

even ten years ago were effective then and not today. Teacher ignoring innovations may cause difficulties not only in teaching process, but also lead to educational problems.

## ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

General analysis of scientific papers suggests that information and communication technologies in the educational process and training of teachers remains a pressing issue on which scholars are working (V. Bykov, L. Chernysh, N. Fominykh, L. Kovalchuk, G. Plakhotnyuk, O. Pochupaylo, I. Prokopenko, N. Shakh, A. Yuzyk, G. Vorobyov, G. Vorontsova, etc.). The problem of formation of skills to use ICT in the learning process is seen in the works of S. Gunko, R. Gurevych, S. Hrystochevskyy M. Kademiya, Y. Mashbyts, N. Morse, E. Polat, J. Robert, Y. Tryus, M. Zhaldak, and others. The impact of ICT on the content and teaching methods were explored by N. Apatova, V. Klochko. A significant contribution to the scientific methods in the use of computers in the educational process was investigated by N. Balyk, O. Hokun, V. Kaymin, K. McLean, N. Morse, , Y. Ramsky, R. Williams.

*The purpose of the article* is an analysis of ICT use in the educational process, readiness of primary school children to use the computer and search for effective ways of ICT in primary school.

## APPROACHES TO DEFINING THE ESSENCE CONCEPT OF INFORMATION AND COMMUNICATION TECHNOLOGIES

For the first time the term «*information technology*» was used in 1958 by H. Leavitt and T. Wisler as the technology of collection, processing, storage and dissemination of information using computer tools. Subsequently, with the word «*information*», a new word «*communication*» was used to not only complement the concept, but also partly change its essence.

Before revealing the meaning of the term, we should define the meaning of «*technology*», which makes ICT. The word «*technology*» in Greek is «the science, combination of methods and techniques of processing materials or raw materials, processing them into commodities». Current understanding of the word includes not only the set of processes of production of goods and services, but also the transformation of matter and use (materials), energy, information, scientific and engineering knowledge to solve practical problems in the interests of the individual and society<sup>4</sup>.

M. Kademiya believes that *information technology (IT)* is a set of methods and software and hardware combined into a technological chain that provides collection, processing, storage and reproducing information in order to reduce the complexity of its use, and to improve its reliability and efficiency<sup>5</sup>.

---

<sup>4</sup>Fominykh N. Y. Sutnist ponyattya "informatsiyno-komunikatsiyni tekhnolohiyi" ta yikh znachennya na suchasnomu etapi modernizatsiyi osvity [Online resource] / N. Y. Fominykh – Link: [http://dspace.uabs.edu.ua/jspui/bitstream/123456789/9084/1/ped905\\_77.pdf](http://dspace.uabs.edu.ua/jspui/bitstream/123456789/9084/1/ped905_77.pdf).

<sup>5</sup>Kademiya M. Y., Shakhina I. Y. Informatsiyno-komunikatsiyni tekhnolohiyi v navchalnomu protsesi : Navchalnyy posibnyk / Kademiya M. Y., Shakhina I. Y. / – Vinnytsya, «Planer» Ltd. - 2011. – 220 p.

With the advent of personal computers the term «*New Information Technologies*» started to be used, which is defined as the introduction of new approaches to the educational process that focuses on the development of human intellectual creativity in order to increase its effectiveness through the use of modern technology<sup>6</sup>. ICT is significantly wider and more general term that emphasizes the integration of telecommunications, computers and other technical tools that allow users to create, receive, access, store, transmit and edit information. In other words, ICT consists of IT. The term was first used in 1997 in report by D. Stivenson for the UK Government.

I. Zakharova understands ICT as «a particular way of information, it is a knowledge about the ways and means of working with information resources and ways and means of collecting, processing and transmitting information to acquire new information about the object being studied».<sup>7</sup>

Information and communication technologies (by A. Dzubenko) – study as a set of software, technical, computer and communication facilities.<sup>8</sup>

ICT must help teachers to reach the goal, to realize its objectives, to seek new ways of organizing learning activities of students and be creative in finding, testing new applications. As was pointed by K. Robinson, we may not be able to predict the future but we can help to shape it<sup>9</sup>.

## **CURRENT STATE AND PROSPECTS OF ICT USE IN THE EDUCATIONAL PROCESS IN PRIMARY SCHOOL**

Computerization of society and the computerization of all areas of human activity have become leading trends of world development. Information and communication technologies increasingly penetrate the different areas of life – science, education, production – requiring appropriate knowledge and skills of future teachers to use them purposefully forming information culture of students of pedagogical universities. ICT can be defined as information technology-based personal computers, computer networks and communications<sup>10</sup>.

According to the Law of Ukraine «On the Fundamentals of Information Society Development in Ukraine for 2007-2015» one of the essential requirements is the introduction of ICT in all spheres of life<sup>11</sup>. As of 2017 it is safe to say that this stage of implementation and transition in the education system continues still as the state still is on the stage of review and individual creative research: teachers are interested and agree that it is not only a positive decision, but necessity. Based on the

---

<sup>6</sup>Fominykh N. Y. Sutnist ponyattya "informatsiyno-komunikatsiyni tekhnolohiyi" ta yikh znachennya na suchasnomu etapi modernizatsiyi osvity [Online resource] / N. Y. Fominykh – Link: [http://dSPACE.uabs.edu.ua/jspui/bitstream/123456789/9084/1/ped905\\_77.pdf](http://dSPACE.uabs.edu.ua/jspui/bitstream/123456789/9084/1/ped905_77.pdf).

<sup>7</sup>Zakharova I.H. Informatsiyonnye tekhnolohii v obrazovanii : ucheb. posob. dlya stud. vyssh. ped. ucheb. zaved. / I.H. Zakharova. – M. : Akademiya, 2003. – 192 p.

<sup>8</sup>Dzyubenko A.A. Novye informatsiyonnye tekhnolohii v obrazovanii / A.A. Dzyubenko. – M., 2000. – 104p.

<sup>9</sup>Robinson K. Out of our minds: learning to be creative [Online resource] / KenRobinson. – 2011. – Link: <https://www.amazon.com/Out-Our-Minds-Learning-Creative/dp/1907312471>.

<sup>10</sup>Plakhotnyuk H. Informatsiyno-komunikatsiyni tekhnolohiyi navchannya yak zasib formuvannya informatsiynoyi kultury pedahoha [Online resource] / H. Plakhotnyuk – Link: [http://ubgd.lviv.ua/konferenc/kon\\_ikt/Section5/Plahotnuk.pdf](http://ubgd.lviv.ua/konferenc/kon_ikt/Section5/Plahotnuk.pdf).

<sup>11</sup>Zakon Ukrayiny “Pro osnovni zasady rozvytku informatsiynoho suspil'stva v Ukrayini na 2007–2015 roky” [Online resource] – Link: <http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=537-16> (21.08.09).

observation and questioner analysis conducted it can be stated that the main reasons for the lack of use of ICT in the educational process are:

- lack of technical support, quality Internet access, special training courses;
- the negative impact of ICT on the health of primary school pupils;
- lack of readiness of younger pupils to use ICT for educational purposes ect.

However, it is only insignificant list of reasons that caution to possess and use a computer. After analyzing the level of ICT use in education, it should be noted that despite the rapid development and use of information in society, teachers put innovations aside, following the old approach and dogma. They use a small amount of resources. On the basis of questionnaires, often in the educational process the teachers use:

- presentations (47%);
- development of tests (46%);
- organizing children to find the necessary information using the Internet (7%).

According Ken Robinson, technology, as was once said, is not technology if it happened before you were born. The pervasiveness of digital technology changes the whole equation for education and for the roles of teachers<sup>12</sup>.

Exploring pupils' ability to use a computer, younger pupils were asked the questions of the developed questionnaire:

### Questionnaire for pupils

1. What form are you in? \_\_\_\_\_

2. Are you a boy or a girl? \_\_\_\_\_

3. Can you use a computer well? \_\_\_\_\_

4. Put “+” sign in an appropriate box in a table to show how often you use a computer:

№		Always	Often	Rarely	Never
1.	To find the right information for papers, presentations, projects				
2.	To listen to music, watch cartoons, communicate with friends				
3.	To play computer games				
4.	To use social networks				

5. Would you like to have lessons with a computer more often?

---

6. What do you usually do at lessons with a computer?

- a) to answer questions of tests on computer
- b) to watch presentations, videos

<sup>12</sup>Robinson K. Out of our minds: learning to be creative [Online resource] / Ken Robinson. – 2011. – Link: <https://www.amazon.com/Out-Our-Minds-Learning-Creative/dp/1907312471>.

- c) to search information in the Internet
- d) other (note, please)

---

7. Would you and your classmates like to have your own page or a channel on YouTube?

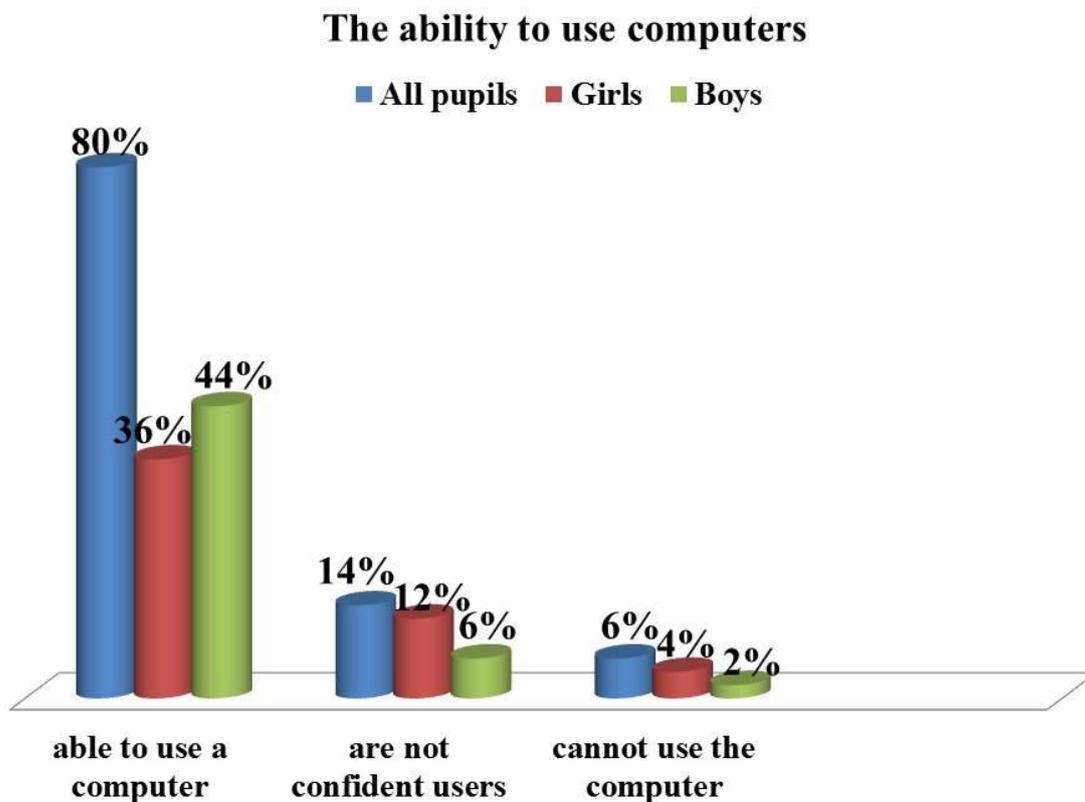
---

8. If you have a choice at what lessons and how to use a computer, what will you offer?

---

By results of a questionnaire which was conducted for pupils of 2-4 classes of general education schools in Lviv region (both private and public) as of 2017 can affirm that:

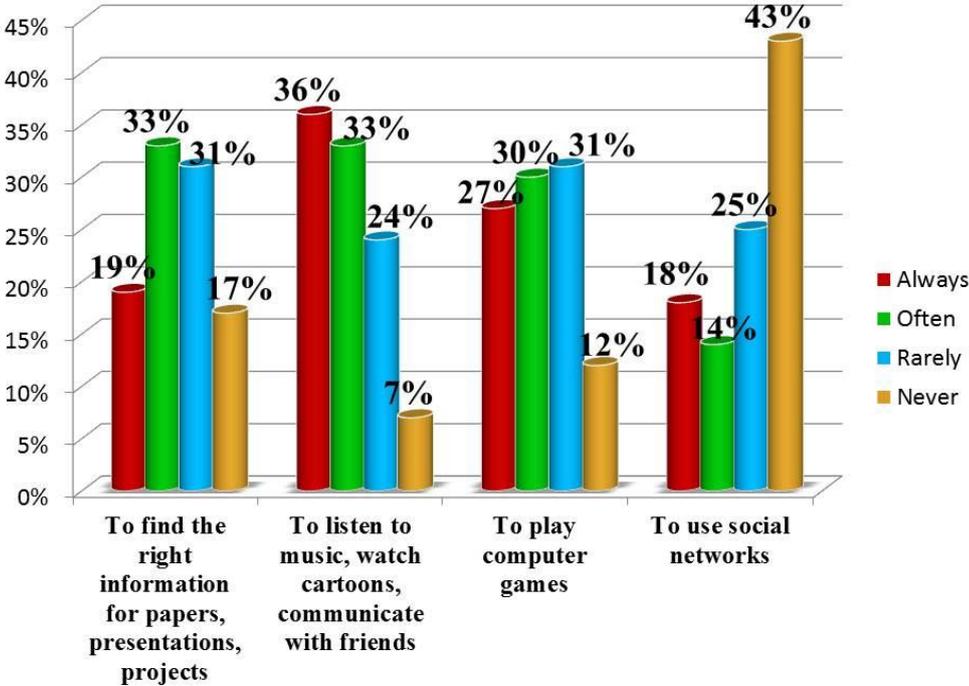
Firstly, the pupils of primary school age have the high level of mastery of the computer and data use frequency. We cannot treat fundamental changes in the country, but emphasize that changes in the information environment impact not only the regular users of computers or other technical means, but also younger students that develop along with technology. Our study shows that 80% (333 people) of primary school pupils surveyed are able to use a computer, 14% (58 people) are not confident users and only 6% (25 people) cannot use the computer (fig. 1 ).



**Fig. 1. The ability to use computers**

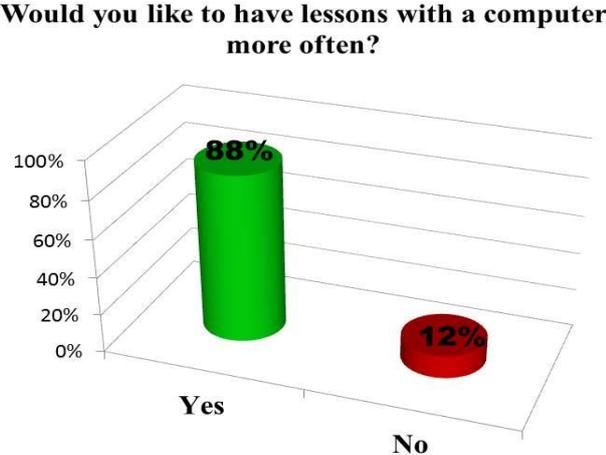
Secondly, younger pupils already have sufficient ICT knowledge. Based on the results we can state that pupils often use the computer for listening to music,

watching videos , cartoons (always – 36%, often – 33%, rarely – 24%, never – 7%), and more rarely to find appropriate information (always – 19%, often – 33%, rarely – 31%, never – 17%), and play computer games(always – 27%, often – 30%, rarely – 31%, never – 12%). The positive fact is that only a small number of children spend time on social networks (always – 18%, often – 14%, rarely – 25%, never – 43%). Details (fig. 2).



**Fig. 2. How often you use a computer**

Thirdly, students are not only prepared for the use of ICT, but also require its intensive implementation. According to the results of the survey, 88% (366 people) want the computer lessons to be more often, and only 12% (50) of the respondents do not (fig. 3).



**Fig. 3. Would you like to have lessons with a computer more often?**

The study made it possible to identify the benefits of using ICT in the educational process, which include:

- dynamic interaction teacher-pupils, pupil- pupil, teacher-parents;
- saves time in preparation and organization of teaching and learning activities;
- visualization and accessible explanation of new materials (simultaneous perception by auditory and visual analyzer);
- flexibility and opportunity to correct mistakes at any stage of the lesson;
- use of interactive learning (exercises for updating, activation, systematization or recurrence);
- use of existing content at all stages of the lesson;
- communication, feedback between all members of the learning process;
- implementation of creative ideas and projects;
- developing interesting tasks;
- exchanging ideas with other teachers.

Based on the research, the ways of using ICT in the educational process were suggested that will facilitate and motivate teaching and learning of younger students.

Firstly, the use of software for lesson preparation:

- text editor (development of lecture notes, preparing interesting tasks, reading texts, control and test works and didactic handouts, training templates for various types of creative collective, individual or project work);
- presentations editor (preparation and development of presentations for lessons to study new materials, for the creation of problematic situations, organization of custom lessons, motivating teaching and learning activities, teaching materials, manuals, guidelines, ads, flyers, collective work with children to develop common project presentations, video greetings, etc.);
- «video-master» (preparation of video materials – montage of different types of video).
- action screen recorders that allow you to capture work on the computer step-by-step.
- «Treasury knowledge», «Steps to science», «Science teaching 1 year», «2 year study», «Childs play», «Tux Math», «Tux Paint», «G Compris», «Omni Tux» (using games, exercises and other functionality of each application).

Secondly, the use of free and open Internet resources available («Pustunchyk», «Samouchka», «Osvita 21 stolittya», «Kazkar», «Chu-Chu TV», «Chytalino», «Learning Apps», «Words Cloud», portals to create puzzles, riddles, tests, content which will help diversify the educational process and involve students into active communication).

Thirdly, creation of own educational materials (blogging, channel on YouTube, generating tasks using appropriate services).

Based on the above results, it is suggested that younger pupils in particular and education in general are ready for changes, the problem remains of teachers who, for some reason, do not use all the possibilities of ICT. This updates the search for ways to solve the problem of formation of information and communication culture of future primary school teachers in the vocational and educational training of students.

### **BIBLIOGRAPHY:**

1. Dzyubenko A.A. *Novye informatsyonnye tekhnolohii v obrazovanii* / A.A. Dzyubenko. – M., 2000. – 104p.
2. Zakon Ukrainy “Pro osnovni zasady rozvytku informatsiynoho suspil'stva v Ukraini na 2007–2015 roky” [Online resource] – Link: <http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=537-16> (21.08.09).
3. Zakharova I.H. *Informatsyonnye tekhnolohii v obrazovanii : ucheb. posob. dlya stud. vyssh. ped. ucheb. zaved.* / I.H. Zakharova. – M. : Akademiya, 2003. – 192 p.
4. Kademiya M. Y., Shakhina I. Y. *Informatsiyno-komunikatsiyni tekhnolohiyi v navchalnomu protsesi : Navchalnyy posibnyk* / Kademiya M. Y., Shakhina I. Y. / – Vinnytsya, «Planer» Ltd. - 2011. – 220 p.
5. Plakhotnyuk H. *Informatsiyno-komunikatsiyni tekhnolohiyi navchannya yak zasib formuvannya informatsiynoyi kultury pedahoha* [Online resource] / H. Plakhotnyuk – Link: [http://ubgd.lviv.ua/konferenc/kon\\_ikt/Section5/Plakhotnuk.pdf](http://ubgd.lviv.ua/konferenc/kon_ikt/Section5/Plakhotnuk.pdf).
6. Robinson K. *Out of our minds: learning to be creative* [Online resource] / Ken Robinson. – 2011. – Link: <https://www.amazon.com/Out-Our-Minds-Learning-Creative/dp/1907312471>.
7. Fominykh N. Y. *Sutnist ponyattya "informatsiyno-komunikatsiyni tekhnolohiyi" ta yikh znachennya na suchasnomu etapi modernizatsiyi osvity* [Online resource] / N. Y. Fominykh – Link: [http://dspace.uabs.edu.ua/jspui/bitstream/123456789/9084/1/ped905\\_77.pdf](http://dspace.uabs.edu.ua/jspui/bitstream/123456789/9084/1/ped905_77.pdf).