Uso de tecnologías de red en las actividades profesionales de docentes de educación de adultos en Ucrania

Use of network technologies in the professional activities of adult education teachers in Ukraine

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RESUMEN.
El uso de las tecnologías de red es fundamental para todas las actividades profesionales en el ámbito de la educación en la sociedad del siglo XXI. El campo de la educación de adultos se ha visto también influida por esta tendencia y las tecnologías de red se han reconocido como herramientas básicas para la mejora de las oportunidades de aprendizaje y para el desarrollo de las propias actividades de enseñanza-aprendizaje. De aquí que este trabajo tenga como objetivo conocer el uso de las tecnologías de red en las actividades profesionales que desarrollan docentes del ámbito de la educación de adultos de cuatro instituciones pedagógicas ucranianas. Para ello se pasó un cuestionario sobre el uso de las tecnologías de red en las actividades profesionales de los docentes de dichas instituciones. Entre los principales resultados destaca que el uso de tecnologías de red es relevante en la actividad profesional de los docentes independientemente de su edad, así como el uso generalizado del ordenador y el sistema operativo Windows para la actividad professional. Entre las aplicaciones de Microsoft destacan, en primer lugar Word, usado por toda la muestra, seguido de Power Point y de Excel, ambos con más de dos tercios de las respuestas. Para el almacenamiento en la nube destaca Google Drive, en los servicios de mensajería predominan Viber and Facebook Messenger y para los servicios de correo electrónico se utilizan mayormente gmail.com y ukr.net, este último es un servicio de email específico de Ucrania. Se sugiere, como conclusion, una formación de los docentes en un más amplio abanico de tecnologías de red que les permita mejorar su actividad profesional.

PALABRAS CLAVE.
Tecnologías de red, docentes, educación de adultos.

ABSTRACT.
The use of network technologies is fundamental to all professional activities in the field of education in the society of the 21st century. The field of adult education has also been influenced by this trend and network technologies have been acknowledged as basic tools for

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the improvement of learning opportunities and for the development of the teaching-learning activities themselves. Hence, this paper aims to know about the use of network technologies in professional activities of teachers in the field of adult education in four Ukrainian pedagogical institutions. For this purpose, a questionnaire was passed on about the use of network technologies in the professional activities of teachers in these institutions. Among the main results, it is worth noting that the use of network technologies is relevant in the professional activity of teachers regardless of their age, as well as the widespread use of the computer and the Windows operating system for professional activity. Among the Microsoft applications, Word stands out, used by the entire sample, followed by Power Point and Excel, both of which received more than two thirds of the responses. Google Drive stands out for cloud storage, Viber and Facebook Messenger predominate in messaging services and gmail.com and ukr.net are mostly used for email services, the latter being a specific Ukrainian email service. In conclusion, it is suggested that teachers be trained in a wider range of network technologies to improve their professional activity.

KEY WORDS.
Network technologies, teachers, adult education.

1. Introduction.

The current stage of society development is characterized by the intensity and the depth of the informatization process. ICT has revolutionized communicative, training and work processes (Vázquez-Cano, León-Urrutia, Parra-González y López-Meneses, 2020). Bykov (2019) has defined such modern tendencies of the information society development as:

- ensuring the mobility of users' information and communication activities in the information space (Mobility), the further development of mobile-target tools and information-communication technologies (hereinafter - ICT) access to electronic data;
- development of cloud computing and virtualization technology, enterprise, publicly available and hybrid ICT infrastructures, as well as introduction of Cloud technology (Cloud Computing and Virtualization, Private, Public and Hybrid Clouds, ICT infrastructures, Fog Computing);
- accumulation and processing of large amounts of digital data, formation and use of electronic information databases and systems (Big Data, Data Mining, Data Bases), in particular, electronic libraries (Electronic Libraries, Repositories) and scientometric databases (Scientometric Data Bases);
- development of the user characteristics of the Internet People (Internet of People – IoP), deployment of the topology of broadband high-speed electronic communication channels (Broadband Communication Channels), systems of formation ICT spaces of wireless access of users to electronic data (Cordless Access to Digital Data, WiFi, Bluetooth, Cellular Networks);
- formation of the Internet of Things (Internet of Things – IoT), the development of its software, including microprocessors, and integration platforms, to provide for the setup, management and monitoring of electronic devices using modern telecommunications technologies;

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- development of Robotic technology (Robotics), robotic systems, in particular, 3D printers and 3D scanners;
- development of data security systems in information systems and counteraction to cybercrime (Data Security and Counteraction of Cyber criminality);
- development of the Industry of Software production, in particular the publication of electronic educational resources;
- ensuring the compatibility of ICT tools and ICT applications built on different software platforms (Compatibility);
- development of networks of ICT service providers (ICT outsourcing market), primarily cloud services (Cloud Services), and (Computing Center Network).

As can be seen from these trends, the informatization of the education system is of great importance in the process of informatization of society. Scientists understand the informatization of education as a set of interrelated organizational-legal, socio-economic, educational-methodological, scientific-technical, production and management processes aimed at meeting information, computing and telecommunication needs (and other needs related to the implementation of information-communication technology) of participants in the educational process, as well as those who manage and provide for this process, including its scientific and methodological support and development (Bykov, 2010).

The informatization of the education system facilitates the transition of education to a qualitatively new level and significantly improves the quality of specialists' training. The effective use of information and communication technologies in the professional activities of future teachers is an urgent research problem, because it provides the opportunity to live actively and act in a society rich in means of preserving, processing and transmission of information in order to use all opportunities provided by information and communication technologies to influence the processes of informatization society.

The term "information technology" was proposed by V. Glushkov back in 1987 (Glushkov, 1987). In his research, the author links information technology to the process of data processing. Thus, as Bilaii (2018) points out, it becomes evident that information technology has always been used in teaching, because learning is a process of finding, analyzing and understanding different information. Furthermore, during the computerization of education, the term" information teaching technology" appeared, and eventually, with the advent of powerful telecommunications and the global Internet, the clarifying term "information and communication technology of training" appeared.

In general, information and communication technologies of training are understood as technologies focused on pedagogically-weighted use in the learning process of various components of modern information and communication technologies for different purposes (Bilaii, 2018). Thus, the educational process involves the simultaneous mastery of the relevant subject, information and communication technologies and ways of their use in the educational process.

The relevance of the use of network technologies in formal and non-formal adult education is conditioned by the rapid development of modern society towards information. Online classes in various disciplines, the use of video and audio content, etc. as an innovative tool for adult

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education have become common. The emergence of cloud-based learning platforms, the use of adaptive information and communication network services, virtual and mobile learning tools are some steps toward addressing the accessibility and quality of learning. Cloud services are expanding the boundaries of access to high-quality electronic resources, characterized by adaptability, mobility, interactivity, free access to documents, a unified infrastructure, and a universal approach to work. Therefore, the implementation of the principles of quality and accessibility to education for adults is the main task for the formation and development of network technologies. Networking technologies involve the use of global and local computer networks to provide educational recipients with educational information resources regardless of the type of (formal / informal) education. Within this framework, UNESCO in its Third World Report on Adult Learning and Education (UNESCO, 2016), calls on policy makers to take advantage of the opportunities offered by new technologies to promote health, literacy and learning.

In the Recommendation on Adult Learning and Education, UNESCO includes a section on the scope of information and communication technologies:

> "Information and communication technologies (ICT) are seen as holding great potential for improving access by adults to a variety of learning opportunities and promoting equity and inclusion. They offer various innovative possibilities for realizing lifelong learning, reducing the dependence on traditional formal structures of education and permitting individualized learning. Through mobile devices, electronic networking, social media and on- line courses, adult learners can have access to opportunities to learn anytime and anywhere. Information and communication technologies have also considerable capacity for facilitating access to education for people with disabilities permitting their fuller integration into society, as well as for other marginalized or disadvantaged groups" (UNESCO, 2016, p. 148).

Hence, the use of ICTs by teachers in adult education is crucial. Within this framework, the study presented here aims to understand the use of network technologies in the professional activities of teachers in the field of adult education. Specifically, the study focused on four Ukrainian adult education institutions.

2. Methodology.

In order to improve adult education by means of network technologies, we conducted an enquiry by means of a questionnaire on the use of network technologies in the professional activities of teaching staff. The questionnaire consisted of 14 questions. All questions had response options. Two or more answers could be selected for individual questions. The questionnaire provided an opportunity to express questions, wishes, comments and suggestions (See Annex 1).

The questionnaire was passed online, and in some cases on paper, to faculty at four Ukrainian higher education institutions. Among the four there is a mutual cooperation agreement, which allows them to carry out studies. In addition, the selection of these four centers followed a criterion of territorial representation.

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- Anton Makarenko Kyiv Vocational Teachers College – Center of Ukraine (Kiev city).
- Chernivetskyi Institute of Postgraduate Teacher Education – Western Ukraine (Chernivtsi city)
- V.G. Korolenko Poltava National Pedagogical University – Eastern Ukraine (Poltava city)

All these universities are either pedagogical (Kiev, Kiev, Poltava) or have a faculty of pedagogy (Chernivtsi).
The sample for this study was 509 teachers, the total teaching staff of the four institutions. Specifically, the data for each institution are as follows: 49 at the Ivan Ziazun Institute of Pedagogical and Adult Education of the National Academy of Pedagogical Sciences of Ukraine, 45 at the Anton Makarenko Kyiv Vocational Teachers College, 109 at the Chernivetskyi Institute of Postgraduate Teacher Education (pedagogical faculty) and 306 at the V.G. Korolenko Poltava National Pedagogical University.

3. Results.

A sample of 185 responses was obtained, representing 36.35% of the total number of teachers in the four Ukrainian institutions selected for the study. The majority of the sample is female, 88.6 per cent (n=164), compared to 11.3 per cent of males (n=21). In terms of age, as can be seen from figure 1, three quarters are between 21 and 40 years of age.

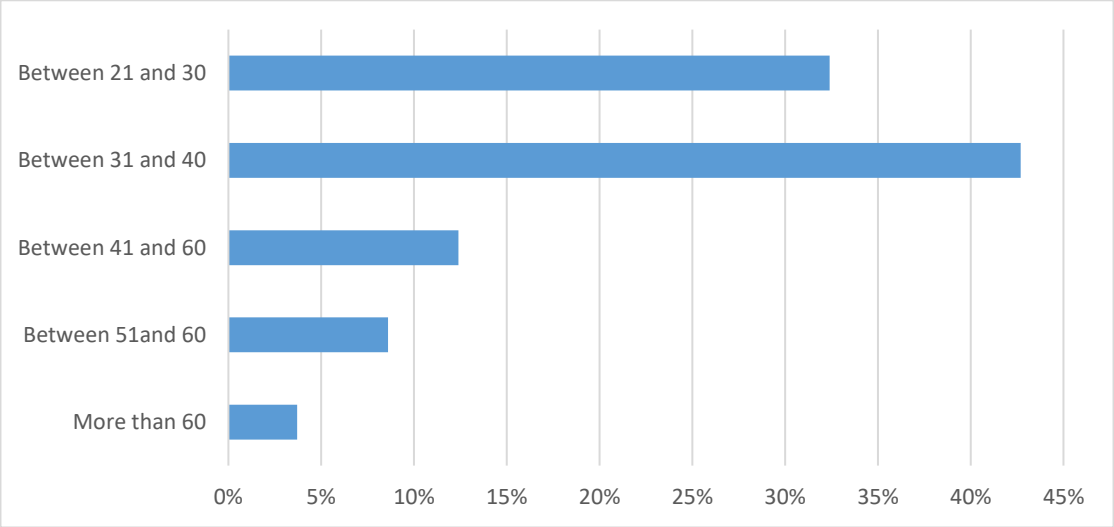

Figure 1. Sample distribution by age range.

The results of the survey on the use of network technologies in the professional activity of teaching staff showed that all respondents (185 persons (100%)) use a personal computer (PC) and the Internet in their professional activity. However, 7,0% of respondents use the

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mobile devices that do not have the ability to connect to the Internet, which significantly limits the use of files stored in cloud storage. Most respondents (85,9%) work on PCs running WINDOWS, and 14,0% work on two or more PCs with different operating systems. For mobile devices, 85,9% of respondents use devices running ANDROID; 7,0% use OC WINDOWS and the same percentage use another operating system.

As for the Microsoft applications that teachers use in their professional activity (see Figure 2), the results indicate that the most common is Word, used by 100% of the sample, followed by Power Point (78,3%) and Excel (71,3%). Other applications with less representation are: OneDrive (21,6%) and OneNote (7,0%). Respondents do not use Sway and Outlook applications. 14,3% of respondents use other applications.

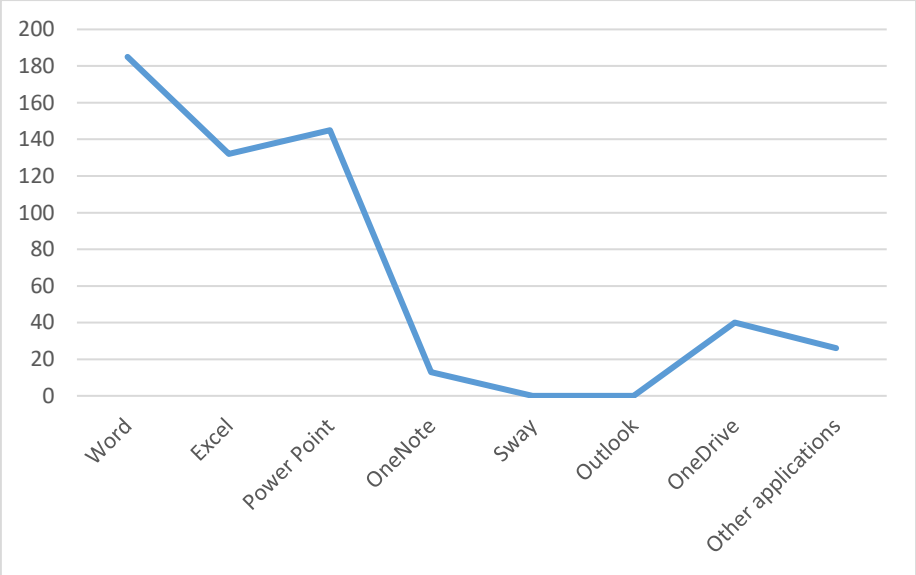

Figure 2. Microsoft Office applications that you use in your professional activity

Because the use of cloud storage is an integral part of network technology, it was considered necessary to analyze what cloud storage is used by teaching staff in their professional activities. Out of the four repositories we have listed in the questionnaire (see Figure 3), just over half of the sample (50,2%) select Google Drive. 1,62% of users opt for DropBox, Mega, and One Drive repositories. 14,0% of respondents use other storage facilities and just over a third (35,6%) do not use cloud storage at all.

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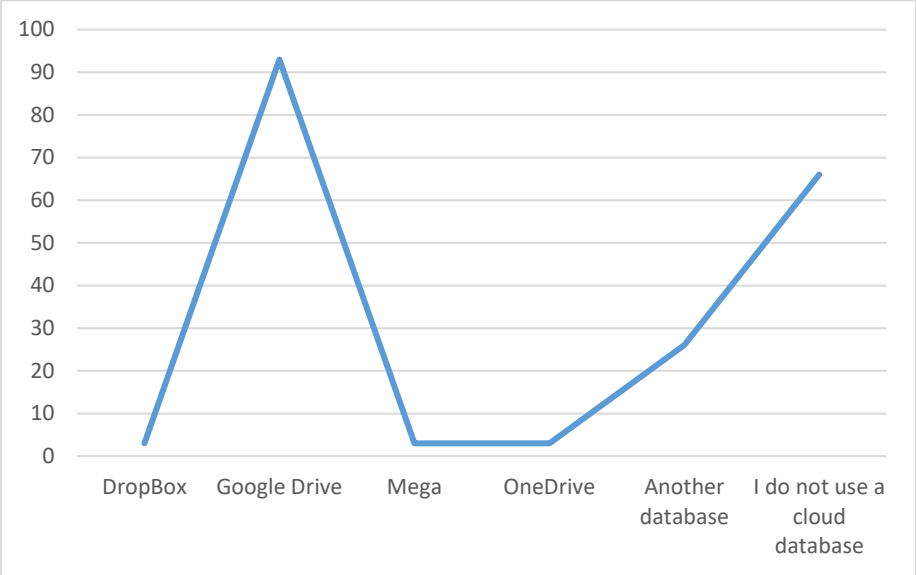

Figure 3. Which cloud databases do you use in your professional activity?

Another important prerequisite for the effective use of networking technologies in professional activities is the presence of messengers (see Figure 4). Two messengers with the same response rate of 85,4% stand out, Viber and Facebook Messenger. Next comes Skype, used by just over half of the sample (50,2%), and with a lower response rate is Whatsapp (28,6%) and Telegram (21,6%). 7,0% of respondents do not use messengers in their professional activities.

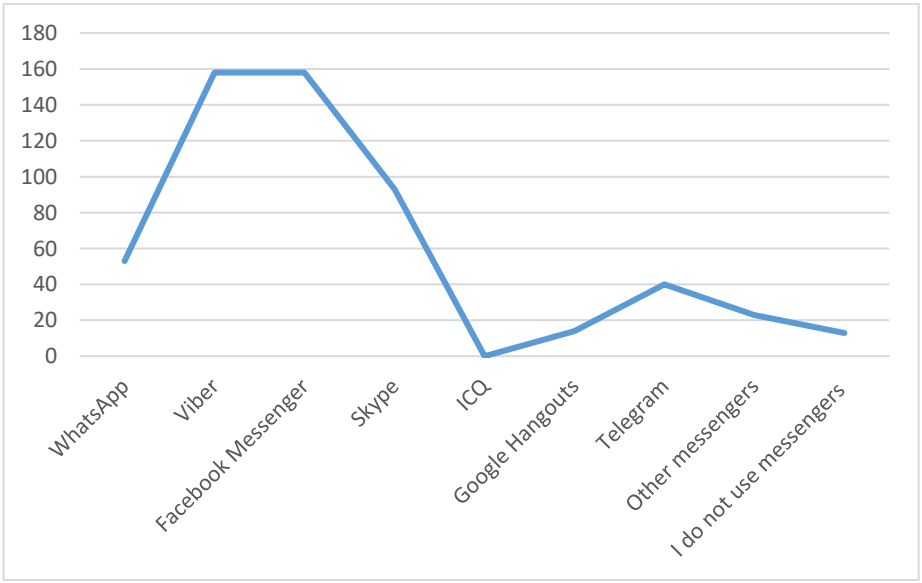

Figure 4. Which messengers do you use in your professional activity?

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The most common email service for their professional activity among the respondents is gmail.com. It is elected by 78,3% of the respondents. “Ukr.net”, a specific Ukrainian email service, follows, with a very close percentage, 71,3%. Other email services have a very low response rate (mail.ru, i.ua., yandex.ua, etc.).

The use of networking technology enables collaboration with Office documents (Word, Excel, PowerPoint, OneNote) and more. Most (78,9%) know about this possibility, but there are also some who do not (21,0%). 85,9% of the respondents would like to use the opportunity to work together with their workforce in their professional activities. Such an indicator means that those who did not know about this opportunity have a desire to work together.

Finally, in relation to the question on “propositions for optimizing work at the Institute”, the suggestions can be grouped into these four ideas:

1. To share the questionnaire and the results of the study on the website of Ivan Ziaziun Institute of Pedagogical Education and Adult Education of the National Academy of Pedagogical Sciences of Ukraine (http://ipood.com.ua) and its official page in Facebook (https://www.facebook.com/ipood.napn/).
2. To identify the deadline for survey.
3. According to the results of the survey, to try to organize a group or the Institute office's page in messengers for the communication of all employees in solving the urgent issues.
4. To write mini recommendations for the best possible use of certain types of messengers in work and communication to solve urgent issues.

4. Discussion.

Educational policies and didactic and pedagogical trends increasingly advocate for the use of technology inside and outside the classroom as a support mechanism for teaching and learning (Vázquez-Cano, Gómez-Galán, Infante-Moro and López-Meneses, 2020). However, studies in other countries on the use of ICT by university professors also show that it remains a challenge and difficulties or barriers that prevent them from integrating ICT into their classrooms include scarce resources and lack of training (Belando-Montoro and Tavárez, 2017), limited time and resources, and lack of knowledge and experience in this training (Muslem, Yusuf and Juliana, 2018), lack of adequate Internet bandwidth and lack of adequate hardware for teaching (Kunda, Chembe & Mukupa, 2018), lack of computers, lack of Internet connection, large classes and insufficient technical support (Laabidi and Laabidi, 2016), lack of technology funding, heavy teaching loads and insufficient Internet bandwidth or speed (Abdelrahman, Ahmed, Al-Shedani & Mohammed Sulaiman, 2019).

The research presented here has sought to understand the use of network technologies by adult education teachers in Ukraine. As López-Gil and Bernal Bravo (2018, p. 97) point out "university educational institution must continue to advance in the rethinking of educational models more in line with the Network Society. Assuming the digital cultural paradigm, demands the achievement of a greater and better training of future teachers in creativity, reflection, research or culture of collaboration. It requires an inter and hyper-connected, innovative teacher, committed to its practice and in a continuous process of reinvention".

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But this requires a prior adequate diagnosis of the current situation, specifically of teacher training, as well as of the practices being developed in their professional activity. Hence the interest of the study presented here.

It should be noted that people from 21 years of age to over 60 took part in the study. This means that the use of networking technologies is relevant in professional activity, regardless of age.

The widespread use of computers and the Windows operating system for professional activity is worth noting. Among the Microsoft applications, Word stands out, used by the entire sample, followed by Power Point and Excel, both of which received more than two thirds of the responses. Google Drive stands out for cloud storage, Viber and Facebook Messenger predominate in messaging services and gmail.com and ukr.net are most commonly used for email services, the latter being a specific Ukrainian email service.

Thus, the results of the questionnaire made it possible to identify the needs of teaching staff regarding the use of network technologies in their professional activities and the possibility of using them. A cloud-oriented educational environment can meet the needs of the teaching staff and take into account the features listed above.

However, it is also interesting to compare these results with those obtained in similar studies carried out in the same geographical context. Some aspects of the use the network technologies in adult education are presented in studies of the Ukrainian scientists.

In particular, Kotkova & Perminova (2019) address the following issues in their research on student and faculty attitudes to the use of ICTs at Kherson State University: a) How do the lecturers and the students relate to the use of ICT in education?, b) How is the educational process changing, involving ICT tools? And c) What are the barriers that prevent teachers from drawing on ICT?

In this study the sample was formed by 124 students and 52 professors of Kherson State University. The results of the study led to the conclusion that the professors find the ICT educational process difficult, because it requires additional information skills, time to create and maintain training courses. Instead, according to the students, ICT makes learning easier and more fun. Teachers consider the lack of necessary technical skills, time and the risks associated with copyright, loss of privacy and plagiarism as the main problem for the active use of ICT. In addition to personal barriers, there are organizational and infrastructure barriers.

Myronchuk (2020), exploring the information and communication technologies as means of self-organization of the educational process subjects, sees their potential in the following aspects:

in more efficient organization of work; in the flexibility, productivity and creativity of the teacher's activity; in saving time resources; and in improving the teacher's information literacy etc. Further, Myronchuk (2020) believes that the use of such information and communication tools as: computers, software, audiovisual systems, online services provides the opportunities for conducting the systematic group, dialog, individual-consultative interaction of the educational process subjects, insures the timely response to the educational – pedagogical tasks, facilitating the realization of reflexive-evaluation and corrective functions. The use of ICT in educational activities enables the teacher to carry out individual consultations, to

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manage and support the educational activities of the undergraduates, to use dialog and group forms of cooperation (through chats in established communities).

Another study relevant to our research is the study on the ICT skills of teachers in educational institutions by the authors Sereda, Savinova, Stelmah and Biliuk (2019) in which among others the authors examined the age of teachers using ICT in their professional activities. Thus, the average age of the majority (60%) of the teachers interviewed was 40-49 years and 40% were in the range of 30-39 years. The period of active use of ICT in teaching is more than 5 years for 70% of teachers, and about 3 years in for the remaining 30% of participants. Unfortunately, according to the studio professors, most do not have computers in their office; they are only available in 20% the of cases.

The analyzed research proves the relevance of our research, and their results confirm the need to use Internet technologies in the professional activity of teachers. However, for effective use of Internet technologies, it is first of all necessary to create scientific and methodological support for teachers with a clear step-by-step explanation of the advantages and disadvantages of a particular technology; offer clear, friendly to any level computer user, guidance on how to install the most common programs and services in the educational process; to develop recommendations for their use; and to provide information support.

The limitations of the study are related to the sample. Although a sample of more than a third of the total was obtained from the selected institutions, it would have been of interest to be able to include other Ukrainian institutions in the field of adult education. Furthermore, the questionnaire used did not allow us to get familiar with the obstacles detected by teachers in the use of network technologies in their professional activity.

We suggest training teachers in a wider range of network technologies to enable them to improve their professional activity. In addition to the technological resources contemplated in the study, teachers in the area of higher education should be competent in the management of databases and bibliographic and documentary collections (UNESCO Digital Library, ERIC, ProQuest Research Library, among others), in the use of resources to prepare classes, to use in class and to monitor and evaluate students (Trello, TED Lectures, The differentiatior, etc.). It is also increasingly important to be part of professional networks (such as LinkedIn, Viadeo or Xing) as well as skillful in using videoconferencing tools (Skype, Hangouts Meet, GoToMeeting, among others).

As future lines of research it is proposed to study the use that teachers make of each of the network technologies, the obstacles they encounter and the needs they express in order to be able to make concrete proposals to improve the quality of teaching and the teaching-learning processes.

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