



## ADVANTAGES AND BARRIERS TO THE INTRODUCTION OF E-LEARNING ENVIRONMENT INTO ACADEMIC TEACHERS' ACTIVITIES IN UKRAINIAN UNIVERSITIES

Oksana Shelomovska, Lyudmyla Sorokina, Maryna Romanyukha,  
Department of Sociology, Faculty of Economics, Management, Sociology and Philology  
Dniprovsk State Technical University (DSTU),  
51918 Kamianske, Dniprovsk region,  
Ukraine

E-mail: o\_nix@ukr.net

E-mail: sludmila1906@gmail.com

E-mail: romanuks@ukr.net

### Abstract

With the development of information society it is becoming particularly needed to construct high-quality system of higher education, aimed at shaping the skills of life-long learning. This is determined by the existing contradictions between continuously increasing volume of information required for people to maintain their competitiveness on the labour market and limited opportunities of traditional educational system to gain knowledge, abilities, skills and other competencies. To resolve this contradiction, educational programs should, above all, be consistent with the principles of multilevel, complementarity, handleability, continuity, integration and flexibility. In our view, significant prospects in relation to these principles and improvement of modern higher educational system are presented by the introduction and development of university e-learning environment. The paper presents barriers to the introduction of e-learning environment in Ukrainian universities, as well as discusses professors' opinions, received via a sociological survey.

### Keywords

ICT-tools, ICT-competence, e-learning environment, questionnaire

### Statement of the problem

The creation of e-learning environment is currently the main task that determines the success of the introduction of information and communication technologies in education at all levels. The management and professors in higher educational institutions take the leading role in this process, who, on one hand, need to encourage teachers to use the new ICTs in the educational process, and, on the other hand, the teachers themselves must understand that from the knowledge that the future of the whole society and the state depends on the knowledge they

impart to students and their compliance with the latest theoretical developments and aspect of professional life. Mastering ICT technologies improves the efficiency and quality of educational process: enables students to grasp material, using their perception of graphical, audio or animated form at a higher level; automate and make more the quality control system more transparent in order to access and manage large volumes of information, etc. It is teachers who should become facilitators of information flow, they should guide and promote students' creative activity, which will permit differentiate and individualize training, increase the interest to the disciplines taught.

## **Introduction**

In contemporary scientific discourse there is a considerable number of publications researching into aspects of use of electronic tools in the learning process, the forms of interaction between teachers and students in e-learning environment, the strategies of HEIs in Ukraine and Europe as to the application of information technologies. Much attention is paid to reviewing the existing legislation on implementing e-learning, crucial educational provisions for distance learning and various aspects of its organization, methodological principles of e-learning and didactic aspects behind the creation of electronic textbooks and more. Much attention is paid to finding and analyzing various ways to build a system of training future teachers in the field of ICT.

## **Related work**

Among the latest research in this area it is necessary to mention the developments of such scholars as R. Gurevich, N. Morze, A. Glazunova, T. Petrenko, G. Kozlakova, T. Kovalyuk, Yu. Tarasich, E. Spivakovskaya, M. Kademiya, V. Gorodyska, Yu. Burovytska, T. Derkach, V. Rakhmanov, O. Naumenko, O. Torubara, A. Zabolotskii and others.

The willingness of teachers to use distance learning technologies was investigated in the papers of N. Morze. They demonstrate that the improvement of quality of training depends largely on the professional expertise of teachers and their mastering of modern methods of innovative teaching, including distance learning technologies because traditional education can not meet the growing demand for training, advisory, reference materials in any place and at any time. Progress in IC competences improves professional competence of the teacher and is one of the primary needs of modern training and self-improvement of teaching staff. The article determined competency in distance learning technologies, discusses indicators for their evaluation, approves a method to evaluate competencies via a method of 360 degrees using specialized software (Morze, Glazunova, 2012). The researcher singled out ways to use webinar-oriented platforms as a tool for teachers; summarized the advantages and prospects of webinars during the implementation of remote form of advanced training of university teaching staff, analyzed the efficiency and prospects of webinars for in-service training for teachers (Morze, Kocharian, Varhcenko-Trotsenko, 2014).

Petrenko T. (Petrenko, 2011) in his article notes that in today's information society, during the implementation of Bologna principles into the educational system traditional teaching methods are enriched by the use of ICT and profoundly change the stable system "teacher - student" into systems "teacher - a computer - student" or "student - computer - information technology" or "student - a computer." The teacher ceases to be the sole source of information. Teachers acts as intermediaries, so they have to interact with students after fundamental training in modern ICTs. Thus, contemporary challenges force teachers to use modern ICTs in teaching which will improve the efficiency of the educational process as a whole. The main disadvantage behind

the use of computer technologies is the reduction in direct teacher-to-student and teacher-to-audience communication, considerable expenses to equip schools and universities.

Regarding teacher ICT competences Kozlakova G. and T. Kovalyuk (Kozlakova, Kovalyuk, 2009) prove that on the whole they meet current level of ICTs, but this correspondence is true only when teachers have part-time duties to develop software, information systems and technologies and introduce them appropriately to the industry. In reality, professors are generally absorbed with their teaching which lacks connection with contemporary activities in enterprises. And universities, unfortunately, can not keep up with contemporary ICT developments. Therefore, the level of teachers' ICT skills should be supported via real training in modern companies.

Tarasich Yu. and Spivakovskaya E. (Tarasich, Spivakovskaya, 2013] discuss the benefits of ICTs for teachers and stress that the new ICTs present unique prospects to intensify educational process – due feedback, visualization of educational information, accessibility of scientific literature and teaching aids, management of knowledge quality control etc. E-learning instruments allow students to focus on the issues currently discussed, to determine their level of information competence, to familiarize them with modern teaching aids, to coordinate the work of the group. The use of ICTs in active learning triggers different modes of perception and dissemination of information, improves the clarity and appeal of the training material, and hence the quality of educational services and knowledge.

Describing the requirements, advantages and disadvantages of the introduction of e-learning in the educational process of the university, M. Kademiya (Kademiya, 2014) convincingly proves that the use of electronic technologies in learning is beneficial for the psychological and pedagogical aspects of teaching, in particular it promotes the development of students' and teachers' individual resources, forms the skills of goal-setting, independent thinking, initiative and responsibility for their work, and also reduces the psychological burden on students and teachers in the process of mutual exchange of knowledge. Advanced training for academic staff in the field of Internet technologies, the use of various forms of e-learning contributes to the development of international cooperation in the educational environment.

In contrast, Gorodyska W. (Gorodysky, 2015) considers it inappropriate today to urge academic staff for the immediate, widescale and hasty application of ICTs in universities; namely interactive side of them - using Internet-based services, including concept maps, blogs, wiki, email, chats etc.). Despite their progressiveness and efficiency in professional teacher's work, the researcher stresses the need for the teachers' to follow the habitual sequence of actions, and to combine traditional approaches and innovative technologies. However, it is considered vital to ensure the applicability of ICTs to the available facilities of universities, to personal teachers' needs, their professional competency and openness for innovative changes.

Among the barriers holding back the introduction of ICTs in the educational process T. Derkach T. (Derkach, 2014) and Rakhmanov V. (Rakhmanov, 2014) mention the lack of didactic methodology and scientifically proven recommendations for their practical application in higher educational institution. The development of ICTs is far ahead of psycho-pedagogical interpretation of the consequences behind their implementation, while reorganization of traditional forms of teaching based on ICTs is challenged by the lack of training in teachers and relevant skills. The prospects to increase the efficiency of the educational process are not fully implemented in practice.

This view is largely supported by Burovytska Y. (Burovytska, 2016), who states that currently many teachers do not know how or are unable to use modern technologies. While currently, the ability to use knowledge and skills in information technology are one of the most important

indicators of expertise of academic staff. Being able to run a personal computer is an indicator of a generally educated person. One needs to train future teachers to use information technology in the context of their future work. There are two significant factors that hinder the process of implementing ICTs in educational system: general information competence of the teacher and the ability to implement multimedia technologies in their activities, not to be only a user for readymade software products, but more as a creator, developer of their own teaching software (Naumenko,2007).

Exploring professors' opinions to the introduction of ICTs in professional activities Zabolotskii A. (Zabolotskii) stresses that the necessary conditions are: personal assurance as to the usefulness of ICTs at different stages of the learning process; the availability of computer equipment; professionally designed software for learning teaching materials; knowledge and skills to use ICTs. The main factor that hinders the implementation of ICT in teacher professional activity is motivation. Motivation to improve their work via ICTs is certainly to be addressed by the administration of the institution.

However, despite relatively high interest in the use of ICTs in higher education modern scientific discourse of today still lacks scientific publications analysing the results of empirical sociological studies revealing teachers' attitudes and motivations as to the use of new technologies in professional activity, their opinion of benefits and challenges of ICTs in educational process.

The purpose of the article is to determine the benefits, motives and barriers to the implementation of electronic educational space in the professional activity of teachers of higher educational institutions of Ukraine.

For more detailed analysis of this issue a case study was carried out to determine the scope of use of information technologies in science, means the integration of scientific and teaching activities, assessment of teachers' actions in electronic environment, the advantages, issues and motives, preventing the introduction of e-learning technologies in teaching. This study was carried out in the framework of the international project «International Research Network for study and development of new tools and methods for advanced pedagogical science in the field of ICT instruments, e-learning and intercultural competences». Project is financed by the European Commission under the 7th Framework Programme, within the Marie Curie Actions International Research Staff Exchange Scheme. Project participants are universities in, Poland, the Czech Republic, the Slovak Republic, Portugal, Spain, the Netherlands, Ukraine, the Russian Federation and Australia. One of representatives from Ukraine in this project is the Dniprovsk State Technical University.

Selecting Dniprovsk State Technical University as an object of study is due to the fact that it is an average university in Ukraine, which allows to apply the research results to a wide range of technical universities in Ukraine.

A sociological study was conducted using a special toolkit in May 2015 by electronic questionnaires which involved teachers and heads of structural divisions of DSTU. The survey involved 53 employees of the University, of which 89% are scientific and teaching staff (59% - associate professors, 26% - teachers, 4% - professors) and 11% - heads of departments. Empirical data permits to make some conclusions about teachers' use of ICT in scientific and professional development.

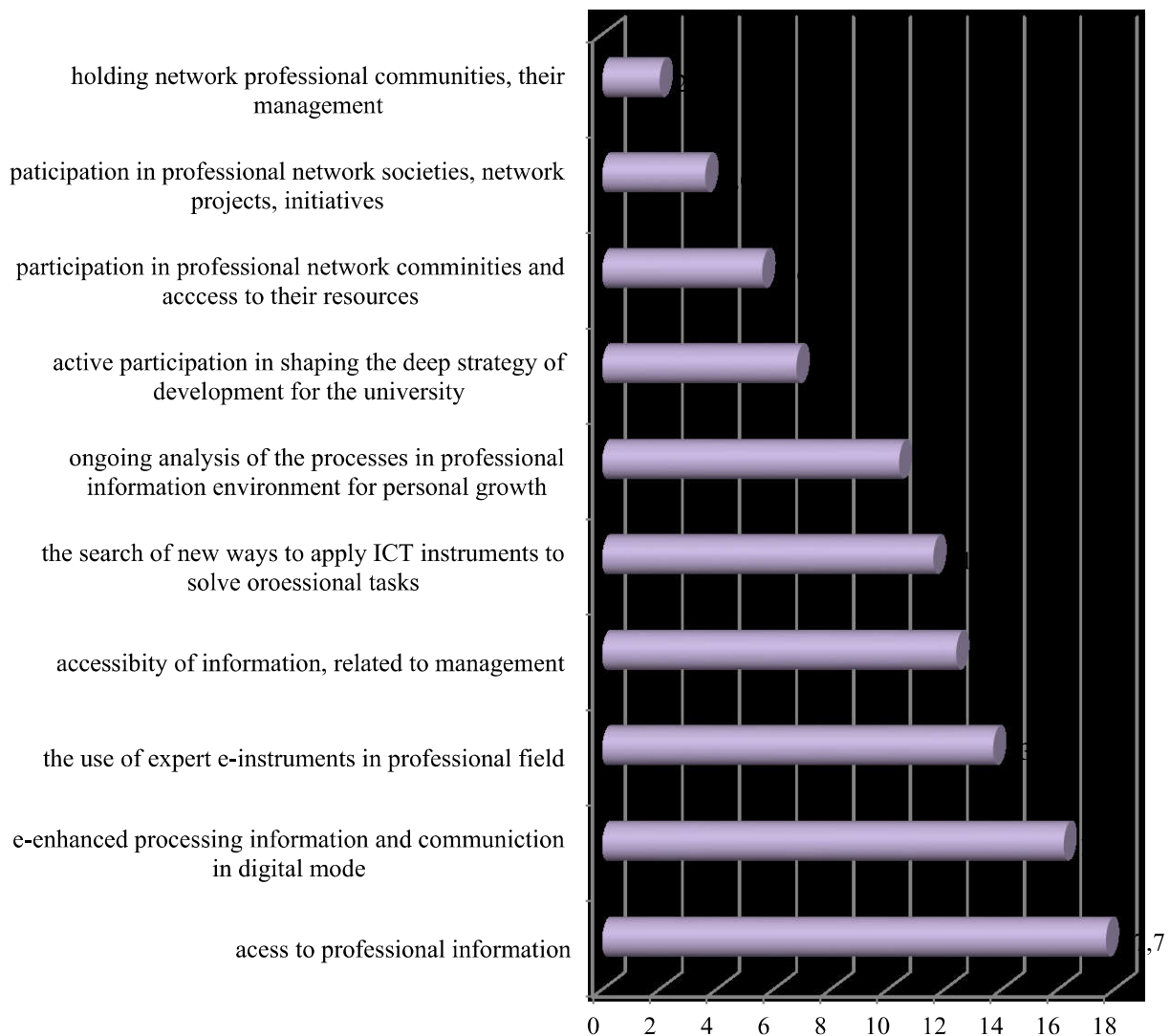
### **Hypotheses of the study:**

1. The main advantage of electronic educational environment for teachers is open and unrestricted access to relevant professional information.

2. The main challenge to the implementation of e-learning technologies in teaching activities is the lack of scheme of incentives for the introduction of information technologies in universities.
3. The main motifs of the introduction of ICT in educational activities is the professional self-realization, improving the quality of students' education and the desire to expand their educational opportunities.
4. Teachers' demand as to the use of e-learning exceeds the level of development of the e-learning environment of the university at the moment.

### **Statement of research results**

The results demonstrate that the greatest benefit for teachers in e-learning environment is access to professional information - it was chosen by 17.7% of teachers (Figure 1.). Also, a significant number of respondents among the main advantages of this environment mention information processing and communication in digital form using general computer-based tools (office applications, e-mail and other). This advantage was preferred by 16.2% of DSTU employees. Among other significant advantages of electronic educational and scientific environment academic staff chose the possibility of using specialized electronic tools in professional environment (13.7%) and ease of access to information related to the management (12.4%). Among the least evident benefits for the respondents we observed the organization of network communities, their management (2%), participation in these communities (3.6%) and access to their resources (5.6%).



**Fig. 1:** The advantages presented by e-learning environment and scientific e-environment (in %)

It is undeniable that the main advantage of e-learning is access to training at any time and in any place. The use of distance learning technologies can have such advantages for students as efficiency, accessibility, training at their own pace, freedom and flexibility, mobility and workability. It is also necessary to highlight the benefits not only for learners but also for educational institutions, namely, reduction of costs on education; a possibility to train a large number of people; improving quality of education through the use of modern means of capacious e-libraries, etc.; creation of a unified educational environment. But, at the same time it represents an additional burden for teachers, since with individualization of learning teachers' time depends on when students want to get in touch with them. This means that the teacher should always be "in touch", that is, should have access to the Internet without weekends or holidays. All this raises a problem of adequate regulation of teachers' labor and decent pay, corresponding to their significant efforts at workplace.

On the other hand, e-learning can not be implemented without quality content, i.e. materials needed in training - e-learning courses, tutorials, presentations, tests, etc. In this case, the main problem lies in the fact that at the moment most of Ukrainian universities (unlike in Europe), have no institutional requirements for the structure of such courses and incentives (financial

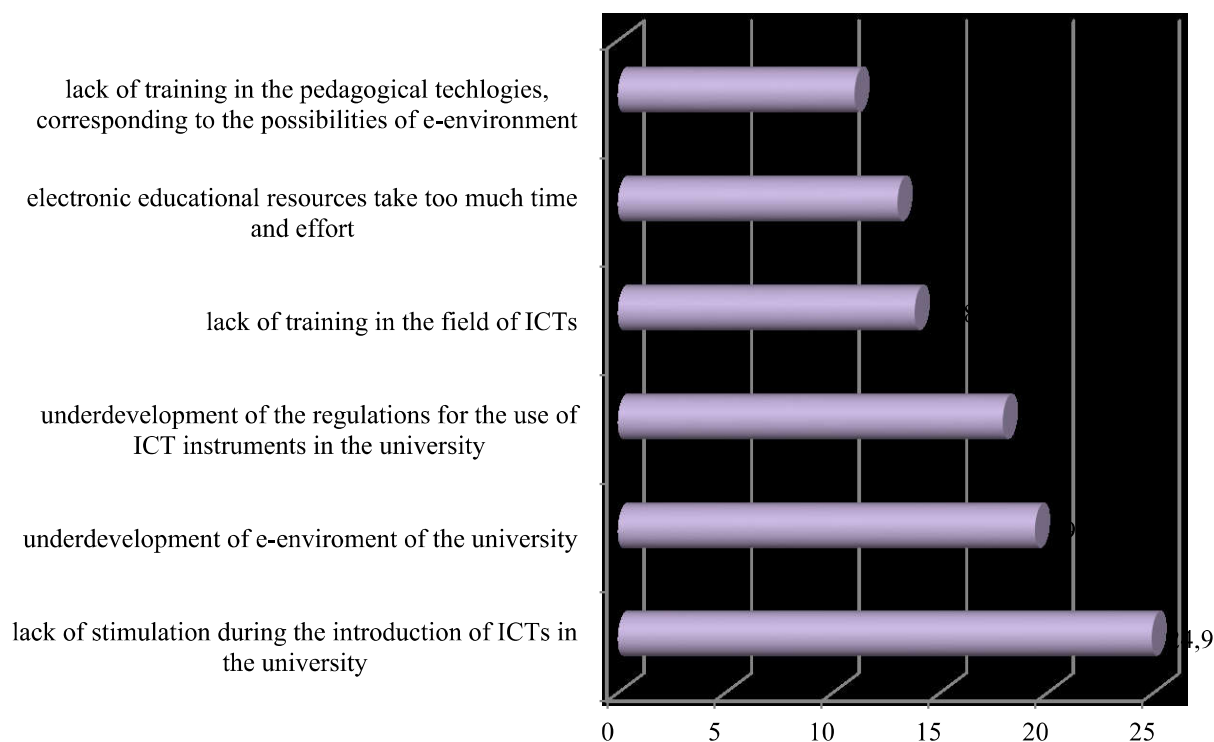
and moral) for teachers to development and implement them in educational environment. An equally painful barrier to the introduction of e-learning in teaching activities is the quality of technical equipment, especially in regions where the communication channels are often of poor quality which significantly complicates the process of learning. The problem of quality of e-learning is also very important (how and who can evaluate e-courses); legal issues related to the protection of intellectual property; financial issues related to expenses on the development of e-courses and their update; the management of advanced training for staff who are able and willing to develop and continuously update such courses. The above mentioned problems are typical for the whole Ukraine.

As to specific problems of each individual university, the results of our research demonstrate that a major challenge for the implementation of e-learning technologies in teaching activities in DSTU is underdeveloped system of incentives for the introduction of information technology in higher education – with every fourth teacher thinking this way (Figure 2.).

Let us present some sociological background as to people's motivation in actions. The sophisticated hierarchical system of each individual's needs, accompanying people in their daily reality, determines motives of their actions. According to the classification of J. Galbraith, human behavior in economy is determined by the motivation system formed for each individual by combination of four basic motives: fear, desire for money (material) compensation, adjustment and identification of objectives. The mentality of Ukrainian people is built primarily on stimulating from the outside - it is important that these objectives are not created by ourselves, but by the people who supervise us. That is why at the moment there is a pressing need for educational authorities to develop education standards and requirements for teachers' professional qualifications.

The results of sociological monitoring show that today the leading motifs for work are financial incentives (stability and monetary compensation). However, university teachers do not see receiving material benefits as having utmost value, for the sake of which they are engaged in professional activity. Researchers Skrauch O.N. (Skrauch) distinguish among the leading motives of teachers' academic activity the following:

- self-fulfillment, the prestige of the course, image and prestige of the university, career opportunities;
- cognitive process, the search for truth, interest in the chosen course, the desire to conduct research, creative nature of work;



**Fig. 2:** Barriers to the introduction of technologies in teaching (in %)

- social motives - the intention to transfer knowledge and experience to the younger generation, interest in educational work, the desire to benefit society;
- financial incentives – increase in income, the opportunity to gain additional income;
- self-affirmation and self-development – advanced training opportunities, recognition of academic degrees and titles, the prospects to improve intellectual potential, belonging to the family dynasty;
- other motifs - convenient working hours, long vacation in summer, employment in a state institution, favorable intellectual and cultural environment, etc..

That is why the main problem for the introduction of distance learning is lack of regulation on the use of information technologies and appropriate material incentives for teachers. This stimulation can be a differentiated pay in connection with individual scope of use of ICTs by teachers and pay increase, etc.

The problem mentioned above is also tightly linked to problems of underdevelopment of e-learning environment of the university (19.4%) and missing regulations as to the use of electronic instruments (17.9%). Besides, a fairly common problem is also certain lack of training in ICTs (13.8%), labor intensity and complexity of efforts in the development of electronic educational resources (13%), lack of training in the field of educational technologies (11%).

Along with this, we need to mention lack of teachers' motivation to use ICT in teaching. Most teachers will to use the latest technology and they see prospects in the technologies, but many of them need encouragement to invest a lot of their precious time, which they might need to spend for further changes. They understand that the opportunities offered by technology make the task more difficult and those changes will take a lot of time. However, computer literacy is the kind of investment that will largely cover all expenses in the long term. If computer



technology have such significant impact on learning and teaching of a particular subject, the teachers should feel comfortable with the latest technology, seeing them rather as means of further development, not something that interferes with their everyday professional life (Burovytska, 2016).

The research data of our survey showed that the majority of teachers (17.2%) chose improving the quality of students' education and the desire to extend educational opportunities for students - 16.9% (Figure 3.) as the main motives of introduction of information and communication technologies in educational activities.

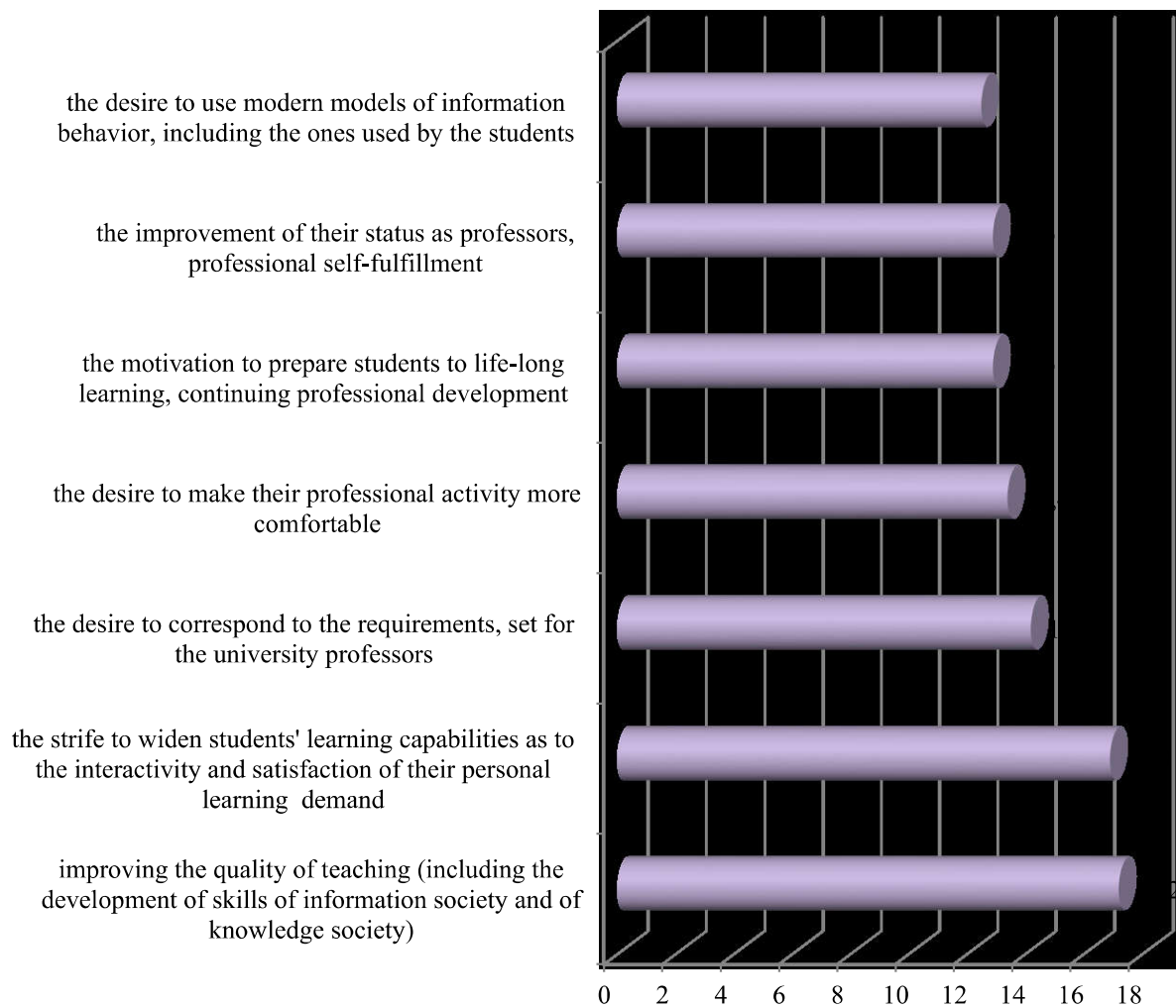
At the same time it revealed that such motives as the desire to conform to the requirements for academic university professors (14.2%), the desire to make their profession more comfortable (13.4%) are less important for teachers. That means that professors the teacher do not so much look for their convenience and the achievement of their personal and professional goals, but they do try primarily to facilitate students' efforts and desire to give them better education.

We agree with the opinion of Dyachenko S.A. in claiming that the development of information culture of university teachers comes with advanced training. A professor willing to create his own e-learning course may need the help of experts from various fields of knowledge. In this connection, it is logical to start creative laboratories or clearing houses, consisting of administrators, coordinators, technicians, consultants, assistants and other teachers who specialize in certain issues. To improve professors' information awareness during their development of e-learning course it is possible to conduct workshops on corresponding software products (Vylegzhanina, Maltsev, 2015). It is necessary to establish a system of ongoing methodological support for teachers on the use of ICTs in teaching, scientific research and professional development.

Teachers' desire to use ICTs in their professional activities, especially to improve quality of students' learning, in our opinion is due to the fact that multimedia technologies increase the quantitative and qualitative indicators of memorized material in comparison to simple listening to a lecture. Teaching with ICT technologies includes the use of material in visual and audial forms which is better memorized by students.

This confirms the research of American scientist and educator E. Dale, who in 1969 came to a conclusion that mere reading some relevant literature or listening to lectures is one of the most inefficient ways to learn something. At the same time, the use of teaching material and teaching it to others was recognized by professor as one of the most effective methods of learning any material. The teachers, being able to access the resource used, may create their own e-courses, enrich them with the necessary methodological support, use the necessary electronic means for educational purposes to improve the intelligibility of the material offered. Students, having access to the resources offered by the teacher gain more access to self-study materials, online discussions, visual perception of information.

According to the study on influence of ICT use on the quality of educational services of universities, based on a comparison of studies determining the quality of distance learning systems (LMS) and IT infrastructure of higher education institutions as of 2009-2010 and 2012-2013. It found that in 65% of institutions the quality of their IT resources directly influences the quality of students knowledge, with 25% saying that "to date, the impact of the quality of distance education systems on the quality of students' knowledge is negligible," and 10% indicate the absence of any influence. The indicators of quality of methodical support for e-learning resources are considered the most influential group of factors that affects quality of

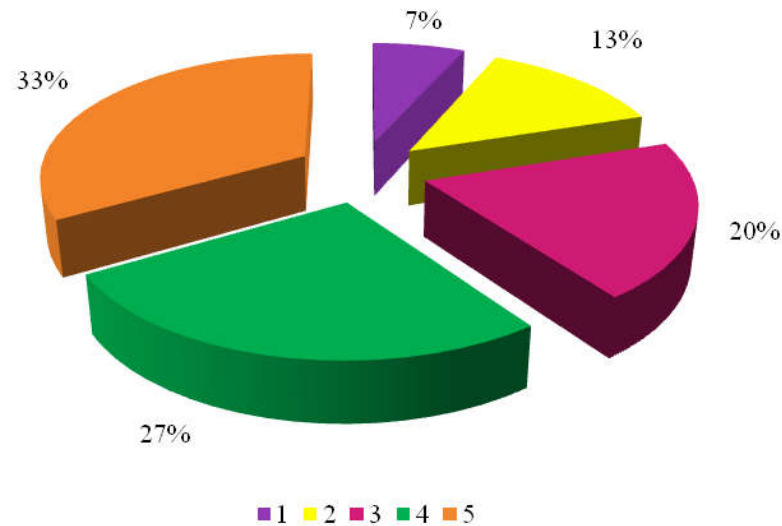


**Fig. 3:** The value of motives behind the introduction of ICTs in professors' activity (in %)

education today, this influence today having increased by about 15% over the past few years. Partial increase of this index is determined by improvement of IT-equipment in universities, increasing the number of staff trained to implement and use modern ICTs and e-learning resources in the educational process (Tarasich, Spivakovskaya, 2013).

The data in our survey also confirm this idea, they allow us to state a fairly high degree of readiness of our university teachers to use ICT in their professional activities. But in this context there rises another problem - the quality of University e-learning environment (Figure 4.).

In our survey we asked professors to evaluate from 1 to 5 points the way electronic environment of our university (computers, networks, wi-fi, LMS, e-library, e-repository) responds to their needs and we found that a third of university professors (33%) give the University environment the highest score. 27% of respondents evaluated this point with four points, together they make 60%. This means that positively-minded respondents are significantly larger in number compared to 20% of those who assessed e-environments' compliance with their demands with minimum points (one and two). That signifies that e-learning environment in DSTU created the information conditions for full implementation of e-learning



**Fig. 4:** Correspondence of professors' demands in the use of e-learning instruments within university e-environment (in %)

At the same time, a fifth of the teachers who participated in the study chose an average rating of 3 points that can be explained by the fact that some middle-aged and elder teachers respondents currently have low level of computer literacy, lack general computer and Internet skills, and thus, they do not use electronic resources of the university in their teaching.

## Conclusion

Thus, our survey demonstrated that the skills of using ICT-tools in professors' professional activities is a necessary condition for the improvement of modern higher educational system, aimed at improving the quality and effectiveness of training. The development of e-learning environment promotes self-realization and self-assertion of university educators, contributes to a smoother educational process and cooperation with students. The scope of implementation of electronic educational space in teaching depends largely on professors' information culture, cognitive style, skills and methods of ICT use in different types and forms of educational activities, as well as in respective subject, the already developed skills to develop ICT-based educational technologies. At the same time, a significant barrier to the introduction of information technologies in the educational process is the difficulties associated with transition from familiar, well-established technology to new, not yet sufficiently well-known and proven. Teachers are aware of the benefits provided by electronic educational and scientific environment and are willing to improve their skills with ICTs which make it possible not only to use new ICT-tools for teaching, but also develop their own. This is evidenced by teachers' willingness to expand their knowledge and skills in the use of information and communication technologies in teaching.

Upon checking the main hypotheses we have been able to state the following:

1. The main advantage of the electronic educational environment for the majority of teachers are open and unrestricted access to the necessary professional information - 17.7% of the surveyed teachers have given preference to this advantage. The hypothesis was confirmed.

2. The main challenge to the implementation of e-learning technologies in teaching activities is the lack of incentive scheme for the introduction of information technologies in universities. The hypothesis was confirmed, as every fourth teacher pointed out this problem.

3. The main motifs of the introduction of ICTs in educational activities is the professional self-realization, improving the quality of students' education and the desire to expand their educational opportunities. This hypothesis was not fully confirmed, as it was found that the main motif of teachers was to improve the quality of students' education - 17.2%; secondly, the desire to expand the educational opportunities for students - 16.9%; thirdly, the desire to meet the requirements - 14.2%. Professional self-realization as a motive for the introduction of ICTs was chosen by only 12.9% of respondents and took the fifth place in teachers' ranking.

4. The hypothesis that teachers' demands as to e-learning tools exceed the level of university e-learning environment has not been confirmed. It was found that 60% of teachers rated as "5" and "4" the compliance of their demands to the capabilities of university e-learning environment.

The authors see prospects for further research in identifying specific objectives and instruments used by teachers to improve their information and communication competences and optimize educational process in the information society.

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