



## FORMATION OF INFORMATION COMPETENCE OF FUTURE COMPUTER SCIENCE TEACHERS IN THE USE OF MOBILE TECHNOLOGIES

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### ABSTRACT

*This article examines the problem of developing information competence of future computer science teachers in the process of their professional training using mobile technology. The article highlights the components, methodological issues and main factors of developing information competence of future computer science teachers in a university based on mobile technology.*

### INTRODUCTION

Today, the main features of the development of modern education are largely associated with its transition to the post-industrial stage. In the society of the new model, it is not the possession of ready-made knowledge by future pedagogical specialists of the basic and secondary general education system that is of particular importance, but the presence of developed skills and abilities related to independent information search, the ability to navigate in virtually unlimited information flows.

In recent years, the rapid penetration of computer technologies in various areas has become a fait accompli. In this regard, completely new tasks arise for education. It is necessary to organize the learning process so that teachers can use modern learning technologies. The training of future computer science teachers plays a special role in the university, since modern information technologies are directly implemented and mastered with its participation. By information technologies we mean a set of means, methods, and techniques for automated collection, processing, storage, transmission, use, and production of information to obtain certain, obviously expected results.

A modern computer science teacher must have the competencies that will allow him to work with local and global networks, modern means of communication of all types, means and devices for manipulating text, graphic, video, audio information, computer graphics systems,



electronic means for educational purposes, implemented on the basis of multimedia technologies, hypertext, hypermedia, telecommunications, etc[2].

## **METHOD OF RESEARCH**

In the context of the transition to the information society, the requirements for the professional training of future teachers are increasing, especially for the level of their professional competencies. One of the most important competencies of a modern teacher is information competence.

One of the ways to implement the basic requirements for a modern education system, such as ensuring the level of competence of future specialists, as well as continuity and individualization of education, is the introduction of innovative educational technologies.

In the educational process, professional activity acquires special significance - the ability to show students the way to independently obtain the necessary information, "teach them to learn" using modern information and telecommunications, including mobile technologies [1].

Mobile technologies, rapidly penetrating the educational process, are a kind of link, an electronic intermediary between the teacher and students, which allow increasing the intensity of the learning process, making it brighter and more visual. The need to revise traditional forms of education and develop new forms, content and methods of managing the educational and cognitive activities of schoolchildren has provided an opportunity to improve and facilitate the work of teachers and students, and, as a result, to obtain a qualitatively new, better level of knowledge. In addition, the introduction of mobile technologies in the educational process at the university has had a positive impact on educational activities, since computers and mobile devices are of stable interest to future specialists.

In the context of the emergence of new mobile educational technologies and the modernization of education, the need for specialists capable of continuous professional growth and social mobility, with a high level of readiness to apply new mobile educational technologies in professional activities, including the readiness to use modern mobile technologies and freely distributed mobile applications when solving professional problems, is becoming more urgent.

In this regard, one of the conditions for the normal functioning of the educational environment of the university is not only the presence of qualified teachers using this environment to organize the educational process with elements of innovation, but also the presence of qualified specialists providing its software and hardware support. According to the competence approach, competence "has an activity-based nature of generalized skills in combination with subject skills and knowledge in specific areas" and is manifested in "the ability to make a choice based on an adequate assessment of oneself in a specific situation." At the same time, the information competence of future teachers is understood as an integral characteristic that determines the ability of a specialist to solve professional problems and typical professional tasks that arise in real life situations of professional activity, using knowledge, professional and life experience, values and inclinations [7].

Information competence of future specialists at the present stage is understood as his readiness and ability to independently use modern information and communication technologies in pedagogical activity to solve a wide range of educational problems and design ways to improve qualifications in this area.



By information competence of future computer science teachers we will understand a mandatory component of the professional competence of a teacher, which determines his readiness and ability to effectively solve professional problems, in accordance with the stages of pedagogical activity, by means of modern computer technologies, taking into account the means and forms of information work [2].

In the process of forming the professional competence of a future specialist in the use of mobile technologies, the following are distinguished [3]:

- ✓ key competencies reflecting the specifics of a certain professional activity;
- ✓ basic competencies necessary for any professional activity, manifested in the ability to solve professional problems based on the use of information, communication, and the socio-legal foundations of individual behavior in civil society;
- ✓ special competencies reflecting the specifics of a specific subject area of professional activity.

To determine the fundamental values in the use of mobile technologies to solve professional problems for future computer science teachers, we will highlight the main advantages [4]:

- ✓ free access to educational materials for both the teacher and students anywhere and at any time;
- ✓ the ability to use mobile programs for training, knowledge testing, and self-knowledge, without the use of additional materials and devices;
- ✓ and most importantly - the possibility of effective distance learning, which is currently in high demand, making training accessible to such categories of students who live far from the basic educational institution, as well as those who do not have the opportunity to regularly attend full-time classes [9].

It is advisable to divide the formation of information competence of future computer science teachers into two stages: basic and subject-oriented.

The formation of information competence of future teachers begins at the basic stage of training and involves the formation of practical skills to plan and organize their activities using mobile technology. At this stage, general-purpose, basic, instrumental information and communication competencies of the cognitive component of information competence begin to form [3].

The basic stage of formation of information competence is aimed at studying software systems, using which the future teacher in the educational process will be engaged in maintaining various documentation, since the teacher often has to deal with the creation of various text documents: educational and methodological complexes, lesson plans, consultations, reports, certificates, letters of thanks, booklets, memos for parent meetings, etc.

By subject competencies in the field of computer science of future specialists we will understand the ability to apply subject knowledge, skills in the field of mobile technologies and personal qualities for successful activity as a specialist capable of creating and using modern means of mobile technology, both in computer science classes and in extracurricular activities [10]. By means of modern mobile technologies we mean software, software and hardware and technical means and devices operating on the basis of mobile technology, as well as modern applications of mobile technology and information processing systems, information exchange,



providing operations for collecting, accumulating, storing, processing, transmitting information and the ability to access educational resources.

To develop information competence in future specialists using mobile technology, the following is carried out [11]:

- ✓ integrated classes;
- ✓ solving practical problems in computer science classes;
- ✓ studying topics related to computer science;
- ✓ Preparation of abstracts, presentations on the topic, materials for the lesson.

One of the factors contributing to the development of information competence of future computer science teachers in the educational process is the integration of disciplines based on mobile technology to designate the integrative relationships between objects, phenomena and processes of reality, reflected in the content, forms and methods of the educational process and performing educational, developmental and upbringing functions [12].

The integration of disciplines based on mobile technology not only solves the problems of teaching, developing and educating students at a qualitatively new level, but also lays the foundation for a comprehensive vision, approach and solution to complex problems of reality. That is why the integration of disciplines is an important condition and result of the formation of information competence of future computer science teachers in the educational process [8].

The purpose of using the integration of disciplines in a university is to form information competence in teachers, the ability to transform information objects in practice using mobile technology. These also allow to show the connection of subjects, teach to apply theoretical knowledge in practice, practice skills of working with mobile technology, activate pedagogical activity of future teachers, stimulate their independent acquisition of practical knowledge.

Integration as a means of forming information competence in future specialists using mobile technology should give students the knowledge that reflects the interconnectedness of individual parts of the world as a system, teach to perceive the world as a single whole in which all elements are interconnected.

Basic requirements for a lesson on forming information competence in future specialists using mobile technology [5]:

- ✓ the lesson should have a clearly formulated educational and cognitive task;
- ✓ high activity and interest of students should be ensured;
- ✓ integration of disciplines should contribute to students' understanding of the essence of the concepts and phenomena being studied;
- ✓ at the end of the lesson, based on the integration of disciplines, it is necessary to formulate conclusions.

Activities in the direction of integration are carried out within the framework of the program for studying a particular software product or several topics using mobile technology. The topic of the project is set by the teacher, together with the students he builds a scenario according to which the action will develop. In the process of working on the topic, the teacher methodically leads students to a problem, the solution of which requires new skills, new concepts, etc. The teacher can suggest new sources of information, or can simply direct the students' thoughts in the right direction for an independent search in mobile technology [13].



To effectively use the capabilities of mobile technology to form information competence in future specialists, the teacher must meet the following requirements [6]:

- ✓ have a basic understanding of working with mobile technology, as well as have access to the information educational space and be able to use it;
- ✓ work with multimedia applications;
- ✓ Know the basics of working in mobile technology, become a guide for students in mastering mobile applications. To teach students the effective use of information resources in mobile technology.

To use mobile technology tools, future computer science teachers in their activities must:

- ✓ know about the existence of publicly available sources of information on mobile technologies and be able to use them;
- ✓ be able to understand and consciously use various forms and methods of presenting data on mobile technologies;
- ✓ Master methods of analysis and synthesis, be able to evaluate the reliability and practical usefulness of available data from various points of view, use them to solve specific practical problems in mobile applications [14].

## RESEARCH RESULTS

Based on the above, we can conclude that today many teachers and practitioners consider the introduction of mobile technologies for the formation of information competence of future computer science teachers to be one of the main conditions for its further improvement.

In turn, effective integration of mobile technologies is possible at a certain level of development of information competence in future teachers.

This component of the information competence of a future computer science teacher is a system of knowledge, skills and abilities necessary to assess the impact of mobile technologies on the effectiveness of the educational process and develop a methodology for their successful integration.

For the full preparation of a computer science teacher for work in a modern information technology society, it is necessary that the educational process at the university also takes place in a new information and communication educational environment that promotes the activation of cognitive activity and the development of students' creative abilities, readiness and desire for self-development. Thus, the system of training a future computer science teacher as a competent specialist should be designed and implemented as an open system ready for further improvement [15].

The preparation of an IT teacher for working with mobile technology should be focused not only on solving the problems that the teacher faces today, but also on the readiness to solve problems that are not yet familiar to him, but may appear in the future. Therefore, the goals, tasks, means, forms, mechanisms and methods of interaction between a university teacher and students should be determined in such a way that the considered concept of information competence becomes important and valuable, if not for everyone, then at least for the majority of future specialists.

## CONCLUSIONS

Today, mobile applications have become the key to education anywhere. Mobile applications for future computer science teachers are in great demand, the beauty of using



mobile applications is that students can study outside the walls of educational institutions without worrying about missing something important, and teachers can check students without wasting time or effort. Thanks to mobile applications, education goes beyond the physical boundaries of the classroom. Most of the techniques of traditional pedagogy can be implemented remotely and mobile devices can become an excellent tool to help in learning.

Thus, the formation of information competence of future computer science teachers is based on the strategy of solving a large number of problems, among which the most important is the task of forming an information educational environment and the possibility of its use in the educational process.

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