International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 04, 2020
ISSN: 1475-7192

ASPECTS OF ENSURING THE QUALITY OF COMPUTER SCIENCE EDUCATION

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Abstract*---*The didactic functions of the informatics course in the formation of the content elements of knowledge necessary in the professional activity of a specialist adapted to modern conditions are revealed. The general methodology, systems and tools, methods, methodical methods of realizing the task were developed and tested on the course material of informatics.

Keywords*---*Higher pedagogical education, informatics, information technology, informatization of education, efficiency increase, Windows application.

I. INTRODUCTION

The comprehensive development and improvement of the Higher Education System of Uzbekistan currently, the integration of Higher Education into the global information space is impossible without the comprehensive Informatization of the entire Higher Education System. Informatization of education involves not only equipping universities with modern means of information technologies and computer technology, but also the creation, information accumulation and active use of computer networks of intra-university and inter-university communications, the widespread introduction of new information technologies in the educational process, research and management of university activities. Thus, this is not a purely technical problem, but the implementation of a set of measures aimed at improving the level of training of specialists by expanding the use of computer technology and computer technology in educational and research work, in managing the educational process.

Education system, especially teaching Informatics and Information Technologies (IT) are the urgent conditions in successful informatizing of our society. Informatization in education system which takes into consideration specific features of teaching process demands careful polishing information technologies and widely opportunity of usage. Moreover, active aspiration to employment modern information technologies in education system must be directed to develop quality and level of knowledge of teachers in information technology and information science [1-5].

Employment of IT sets these tasks in realization of the given goal:

• supporting and developing systematic thinking of learners;

• backing all types of cognitive activities of human-being in gaining knowledge, developing and consolidating abilities and skills;

• realization of individual principles of individualization of education process in keeping its completeness.

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DOI: 10.37200/IJPR/V24I4/PR201295
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

Therefore, just taking possession of information technologies is not enough, so that we are going to recommend and highlight some effective ways of usage and taking into account some peculiarities and possibilities in teaching process. These given activities will help to implement tasks of our investigation.

For a number of years, information technologies were in the view of the field of higher pedagogical education, including within the framework of scientific research (ScR). Mainly ScR, on the so-called basic and applied informatization technologies was supported. Ultimately, all the advances in the use of information technologies in the field of education, the creation of telecommunications networks and the support of information flows in networks, the creation and maintenance of data banks and knowledge bases, expert systems and other types of IT should serve to one goal which develops forms of a methodological basis for the use of information technology in the process of education and training. In essence, at present time the society faces the task of learning as a whole correctly, optimally and harmlessly using computers in the entire education system.

At the II International Congress of UNESCO "Education and Informatics" under the technology of teaching is understood the way of implementing the content of training provided for by the curricula, which is a system of forms, methods and means of teaching that ensure the achievement of the set didactic goals. Computer technology training (CTT) is a learning technology based on the principles of computer science and implemented through computers. The main distinguishing feature of CTT is the use of computers as a new dynamically developing means of teaching, which fundamentally changes the forms and methods of teaching.

The active policy of manufacturers of computer equipment and software, as well as firms providing telecommunications services, has led to the fact that a person of a modern information society can no longer do without a computer. However, even specialists in the field of education of developed countries today cannot unequivocally answer the question: "How to realize the new opportunities provided by information technologies, and how can these new technologies be used effectively in the learning process?". This is despite the fact that in the education system of these countries computers are used much longer and more efficiently than we have.

A computer as a learning tool can be used only if the appropriate software (software) is available. Application of IT in education and training involves the development and use of educational software. The peculiarity of this type of software is that it should accumulate along with the computer program, as such the experience of the instructor-subject, the information content of certain academic disciplines, and also meet the requirements of the educational standard.

New hardware, in particular a computer, proved its indispensability in the university. They are one of the guarantees of successful modernization of the educational process. The growth of modern technology in traditional forms and methods of teaching allows to significantly adjust and manage the learning process, increase the motivation of the teaching, as well as increase the informativeness, intensity, effectiveness of education.

It turned out, however, that the mere presence of computers does not yet guarantee effective education. Experience shows that the use of computers in the university has generated many difficulties and problems: insufficiently qualified teachers who own computer equipment, there is no clear understanding of what his pedagogical capabilities are.

The selected sample analysis of the basic training of the teaching staff of the structural divisions of higher education institutions, which teach students the skills of working on computers, shows that their bulk has a technical background.

DOI: 10.37200/IJPR/V24I4/PR201295
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

Such teaching staff, as a rule, does not have proper pedagogical training, which significantly affects the quality of students' preparation.

In connection with the foregoing, the relevance of the research topic is beyond doubt, since the development of modern approaches to the use of information technology tools improves the quality of teaching, contributes to the intensification of the learning process.

The studies were conducted in 2016-2017, 2017-2018 academic years on the basic material of the course "Informatics", taught at the bachelor's degree 5110700-Methodology of Teaching Informatics at Nukus State Pedagogical Institute named after Ajiniyaz, Republic of Karakalpakstan, Uzbekistan.

The following research tasks were solved:

• to identify theoretical and methodological prerequisites for actualizing the potential of information technology in a pedagogical educational establishment.

• to reveal didactic functions and psychological and pedagogical conditions of using information technologies, which increase the effectiveness of the educational process in the pedagogical university.

• to develop the author's program of the course "Informatics" and the scientific and methodological support of its teaching in the conditions of a modern university, which prepares specialists in the field of computer science teacher.

• to carry out a pilot experimental verification of the scientific and practical recommendations of the study.

The significance of the research is that it has developed a methodological scheme for the university educational process of training specialists who master modern information technology, the volume and content of the computer science course have been revealed.

As an objective basis for fundamental training of specialists, a combination of factors contributing to the substantive and procedural synthesis of knowledge and skills is considered. These factors include methodological and gnoseological principles of scientific cognition, regulatory and normative principles of teaching, didactic rules and algorithms, established scientific concepts, trends in the development of scientific knowledge and their reflection in the content of the course of computer science.

The basic principles and techniques for increasing the efficiency of teaching the computer science course at a pedagogical university are developed. They include the principles of purposefulness, relevance, reasonable sufficiency and optimal tightening of scientific information.

From the general didactic positions, psychological and pedagogical conditions that improve the quality of students' knowledge in computer science are considered. This systematization includes the provision of an integral system of knowledge, skills and skills for students, the formation of their professional qualities, theoretical and practical training of future specialists to use the necessary information technologies in future professional activities.

Thus, the significance of the study is as follows:

1. The didactic functions of the informatics course in the formation of the meaningful elements of knowledge necessary in the professional activity of a specialist adapted to modern conditions are revealed.

2. The general methodology, systems and tools, methods, methodical methods for implementing the task have been developed and tested on the course material of computer science.

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3. The author's program-methodical technologies of use and the corresponding program for monitoring and evaluating the knowledge and skills of students in computer science make it possible to form a complex of knowledge, skills and skills of students prepared for work using modern technologies.

The implementation of these tasks was carried out through a series of successive stages:

1. At the first stage, the analysis of domestic and foreign hardware and software tools and systems used in the educational process.

2. On the basis of generalization of the results of the analysis, with the active participation of the author, the material base of the Chair "Methodology of Teaching Informatics" of the Nukus State Pedagogical Institute was updated. Such material base allowed introducing the study of modern software into the educational process. For this purpose, trial versions of the lessons learned for the solution of user tasks were developed by sections: Windows 7, Word 2010, Excel 2010, and Access 2010. Five teachers of the Informatics Department participated in the improvement of the methodology for studying these tasks. After a two-semester experiment, the scheme for conducting such activities was worked out and is reflected in the published teaching and methodical manual [6,7]. Further improvement of this teaching aid was carried out in accordance with a monitoring program developed with the participation of the author.

3. The implementation of the second stage has made it possible to compile the final version of the teaching aid [6], which makes it possible to improve the efficiency of teaching computer science and developing skills in real conditions using modern computer technologies.

4. Experimentally proved the expediency of using techniques and methods recommended for use in the educational process.

During the research:

1. Developed a holistic system for learning to work with Windows-based applications: a graphical editor Paint, a word processor, Word, an Excel spreadsheet, an Access database management system.

2. The effectiveness of the proposed scheme for conducting classes has been experimentally proved, especially when teaching the computer science course for students with shortened studies (based on secondary specialized education).

3. An effective system for monitoring and assessing students' knowledge was developed using the Nukus SPI monitoring program developed by the author together with the staff of the Informatics Department of Nukus SPI in Delphi 7.

4. By the questionnaire, it is established that the choice of students to use this monitoring program during intermediate and final control of knowledge is preferable.

5. Experimentally established the preference for conducting laboratory sessions, combining the use of methodological recommendations on paper medium, than electronic versions of the training.

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