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STUDENTS' INFORMATION CULTURE DEVELOPMENT AS PART OF SELF-LEARNING ACTIVITIES IN HIGHER EDUCATION

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Abstract

In the modern society, people must learn how to adapt to new social and economic conditions, and this requirement causes certain changes in the professional training system - it should develop the creativity of students and teach them how to obtain knowledge using a comprehensive approach. In the authors' opinion, to achieve these goals one should find new ways to solve two basic problems. Firstly, the methods of information delivery should be reconsidered, and, secondly, students' self-learning activities should be organized in a new way. The aim of the new self-learning system is to make students comprehend new material after learning it, thus internalizing this information, which should be achieved during students' self-learning activities. It means that the status of a student should change. So, students must be taught how to interact with the informational environment as part of their self-learning activities. Thus, developing students' information culture should become one of the most important goals related to improving the quality of higher education professional training. The article addresses some aspects of students' information culture development as part of self-learning activities taking place in a higher educational institution. It describes the concept of the information culture of a graduate and its components. The authors specify the role of the information technology infrastructure and point out the potential of the didactic computer environment in the development of students' information culture as part of self-learning activities.

Keywords: Information culture, didactic teaching kit, didactic computer environment, self-learning activities.

1. Introduction

The new social and economic conditions in Russia and the modernization of Russian education in general have caused the change in the requirements, set for the level and quality of professional training within the higher education system. Present-day professionals should possess such qualities as a sense of purpose, a business-like approach, initiative spirit, zeal and self-determination. In other words, they must be able to compete at the labour market. To achieve these purposes in higher educational institutions, teachers should develop students' creativity and give them a clear idea about their future career, students should be taught how to acquire new knowledge and process the incoming information using a critical approach; students should also learn how to make decisions of their own in a constantly changing society. The above-mentioned ideas make it clear that it would be reasonable to change the position of students and make them self-reliant and active participants of the learning process who are able to handle learning tasks and find the ways to solve them and put the solutions into practice. This implies teaching students how to master technological methods of interaction with the information environment (Afanasyev, 2016) as part of self-learning activities. From the authors' point of view, one of the ways to address this issue is to find the way of applying information technologies during students' self-learning activities within the higher education system.

Therefore, a new approach should be adopted to specify the scope, quality, quantity and ways to obtain and offer the learning content to students. The existing methods for designing, developing and applying IT learning techniques in higher education must be reconsidered. Modern information technology serves the means of storing structured data and provides an easy access to it. Thus, the application of IT resources shifts the focus of learning aiming it not at memorizing a large amount of material but rather at developing the skills which will help to search for and process the information, as well as to retrieve the information necessary to solve study tasks and job tasks.

2. Problem Statement

The ideas mentioned above make it clear that the rearrangement of the knowledge shared by man and a computer is an important issue, and the emphasis should be placed on developing analytical abilities and skills. Therefore, using the information technology as part of teaching and learning in a higher educational institution should be aimed at achieving the strategic goal which is not only to produce a qualified expert but also to foster an active person and creative thinker who is capable of constant self-improvement and development (Paschenko, 2013). Consequently, developing students' information culture should be regarded a top-priority objective related to the quality improvement of higher education professional training (Gruzdeva, 2011; Tyoplaya, 2012; Tonkih, 2015).

3. Research Questions

The authors have specified a number of tasks which should be addressed during the research study: defining the term "graduates' information culture", analyzing the components of information culture, defining the role of the information technology infrastructure in information culture development,

pointing out the possibilities of the didactic computer environment in relation to students' information culture development as part of their self-learning activities.

4. Purpose of the Study

To solve the problems mentioned above, the authors have set the following research goal: finding the ways of students' information culture development as part of their self-learning activities in a higher educational institution.

5. Research Methods

To achieve the research goal, the authors have used a system of various methods. These methods include: reviewing and analyzing the research papers in pedagogy, psychology and teaching methods related to the subject-matter; analyzing the structure and functions of future specialists' professional activities; observing and studying the teaching and learning process; conducting a survey, etc.

6. Findings

The dictionary of Professional Education terms defines information culture as knowledge and skills of efficient data search and use done by man. The authors find this definition rather simplified. The authors support the point of view presented by (Kozlov, Robert, 2005) and (Hodyakova, 2006) and believe that a graduate's information culture can be interpreted from a comprehensive standpoint as a concept with a wider meaning, as a subsystem of general and professional culture of a person which includes the following interrelated components:

A. the axiological component which implies regarding human information activity on a personal level and accepting it as a humanistic value;

B. the communication and ethics-oriented component which addresses the culture of communication and cooperation related to informational contacts as well as the skills of using communication services efficiently for person-to-person and team interactions and the ethics of communication in the information sphere;

C. the cognitive and intellectual component characterized by the competence and a wide range of knowledge, related to information technology, and by the flexibility and adaptability of mind;

D. the prognostic component which implies foreseeing the possible results of information-related activities and their consequences as well as professional and social adjustment to ever-changing informational conditions;

E. the practical component providing the use of the information technology possibilities for the efficient handling of study and job tasks which assists students in performing routine actions;

F. the legal component which regulates informational relations according the existing laws and which implies the awareness of the responsibility for one's own actions related to informational resources.

The above-mentioned ideas underline the necessity to find the ways of students' information culture development as part of their self-learning activities in a higher educational institution. The authors

propose introducing the information technology (IT) infrastructure as a means to achieve this goal. The information technology (IT) infrastructure of the teaching-learning process in a higher educational institution should be defined as a system consisting of informational and technological components, viewed as a whole. And the IT introduction into the learning process, with which these components functionally and structurally interrelate, enables a teacher to cope with didactic tasks using the technological basis and thus, with a guaranteed efficiency.

Managing the set didactic objectives, aimed at comprehending the content of higher education professional training, will be successful if the informational component is addressed and students and teachers are offered all the necessary learning materials and other types of information.

The authors regard the informational component as an IT-based didactic kit applied for a certain academic discipline. The kit in question is a system integrating educational software, databases and other didactic materials and teaching aids which provide the proper conditions for the active informational interaction between a teacher and students within the teaching and learning process (Vilenskiy, Obraztsov, Uman, 2010).

The idea of introducing the academic discipline content as part of didactic (teaching and learning) kits is not a new one. It originated at the end of the 80-s and the beginning of the 90-s of the XX century which can be observed in research papers by (Bespalko, 2009). As the new teaching methods developed, the computer-related ones among them, some scholars, such as (Kozlov, Robert, 2005; Robert, 2014) started supporting the idea of didactic software- and IT-based kits.

After reviewing and analyzing these research papers written by the above-listed authors, the authors can assert that the approach that they propose, implying students' information culture development within the didactic kits and as part of self-learning activities, has a number of essential features which make it different from the earlier theories. One of those differences is admitting the possibility of designing and forming a didactic kit of an academic discipline within the comprehensive approach. Such kit is regarded as a didactic system which enables a teacher to implement IT-based teaching methods (technology) through the informational component of higher education professional training. It helps to achieve the relevant goals and give proper professional training to undergraduates as well as to develop their information culture. Each component of the didactic kit both carries relevant information and performs specific functions set by the teacher. Thus, the authors suggest considering the IT-based didactic kit of an academic discipline to be an ever-evolving knowledge database which serves a specific subject studied by undergraduates.

"It is reasonable to point out the following advantages of implementing these kits in higher education institutions. First, these didactic kits are designed as integral systems of educational software brought together to serve the means of collecting, organizing, storing, processing, transmitting and offering the educational information to users. Second, all the components of the didactic kits are interrelated and have the same IT base and the same hard- and software environment. Third, from the very start, while the didactic kits were being devised, they were meant to be used in local area networks, as well as in distributed networks of a certain higher educational institution, and for distance learning. That helps to tackle the issue of providing the necessary information, communications and telecommunications infrastructure within a higher educational institution" (Obraztsov, 2001).

The content and the structure of a kit can be rather flexible, depending on the content of the discipline which it has been designed for. Thus, for example, the didactic kit of the IT infrastructure for the course in Higher Education Pedagogy and Psychology, which is used to train postgraduates at Orel state university named after I.S. Turgenev, includes: the course syllabus (as hypertext); the electronic textbook including the text of the course lectures as well as the electronic book with diagrams and images; the reference system consisting of two electronic reference books in Psychology and Pedagogy respectively; the electronic practical guide of the course (as hypertext); the computer-aided system for students' knowledge assessment and control (Obraztsov, 2001).

The second component, providing the procedures of students' higher education professional training and information culture development, is the technological base which implies the implementation of IT-based educational methods (technology) in the academic process.

The results of reviewing and analyzing scientific and research literature on the computerization of higher education professional training prove that the present-day didactics has not yet proposed an explicit definition for the IT-based teaching methods (computerized teaching technology). As a rule, different authors have a different understanding of their essence and contents. However, the analysis of the most common definitions, which one can come across in pedagogical literature, enables one to distinguish between two distinct approaches in their interpretation. The first theory views the computerized teaching technology as a didactic process which employs a set of new techniques and methods of educational information processing, incorporated into the pedagogical system. The second approach deals with creating a technical background of education where the information technology plays a key role. Thus, in the first case the emphasis is placed on the educational process while in the second – on the specific IT resources used in this process.

The implementation of the technological component of the IT infrastructure in a higher educational institution should be based on the first approach mentioned above. While the authors do not deny the second approach completely, they still believe it is not wise to regard IT-based teaching methods only as the software used in the educational process because the idea of education computerization should be considered from a more broad-scale standpoint. In the authors' opinion, the proper IT-based teaching methods should:

– correspond to the basic principles of the technological approach (advanced planning, diagnostic goal-setting, integrity, reproducibility, feedback presence, etc.);

– be used to manage the tasks which have not been handled yet either in theory or in practice;

– be used as an integrated kit of modern educational software products which have been devised to meet the didactic objectives and tasks set by a teacher and which will serve the means of collecting, processing, storing and offering educational information to users (Vilenskiy, Obraztsov, Uman, 2010).

Therefore, the IT-based teaching methods (technology) should be viewed as a didactic process which involves an integrated kit of modern educational software and enables one to organize the optimum information exchange between a teacher and students aimed at achieving the desired outcome.

The implementation of the IT-based teaching methods is aimed at designing a specific educational IT-based environment in a higher educational institution which will help a teacher to organize active educational interaction with students within a certain academic discipline and will guarantee achieving

the relevant didactic goals. Moreover, it should be noted that the special educational environment should have the proper professional content corresponding to the FSES HE requirements and the qualification requirements for a certain specialization of higher education professional training.

The authors can point out the specific features of the IT-based teaching methods as part of the IT infrastructure (Bespalko, 2009; Guschin, 2014; Lavrentyeva, 2008). First, the teaching methods or techniques serve the core for the creation of the necessary IT-based environment, which contributes to active educational interaction between a teacher and students. Second, a teacher works out the structure and content of a didactic kit while he is devising the IT-based teaching technology; the didactic kit is arranged according to the educational goals, the educational content, the tasks to be solved and the techniques to be used. Thus, the didactic kit is the key component and the basis of the IT-based teaching methods.

The procedures of working out the IT-based teaching methods can be carried out according to the following pattern:

(1) setting the diagnostic goals of the teaching-learning process – describing the desired didactic outcome quantitatively;

(2) specifying the educational content as part of the future specialist professional activities;

(3) pointing out the structure of the learning materials, their informative capacity as well as the system of conceptual links between their components;

(4) defining the necessary levels of learning comprehension and estimating the initial levels of students' proficiency;

(5) specifying the structure and contents of the IT-based didactic kit for a certain academic discipline, designing this kit;

(6) working out the procedures of the educational process: presenting the professional experience which students are supposed to gain as a system of intellectual and practical professional tasks;

(7) searching for the special didactic procedures aimed at mastering professional skills – choosing the modes and methods of individual and class activities; finding the proper pattern to organize the educational interaction between a teacher and students (choosing and explaining the choice of communication situations types);

(8) choosing the control procedures and assessment tools to estimate the proficiency level as well as the methods of individual correction;

(9) presenting the draft project of the IT-based teaching technology as a flow process chart.

The result of devising the IT-based teaching methods (the computerized teaching technology) is working out a flow process chart which serves a kind of specification for the educational process where all its basic characteristics ensuring the learning success are presented, integrated and concise: diagnostic goal-setting; logical structure; proportioning of the learning material and assessment tools; the description of the didactic process as a gradual, step-wise sequence of a teacher's actions which specifies the order of applying the relevant components of the didactic kit; the system of control, assessment and correction.

Thus, if one views the IT-based teaching technology as part of the IT infrastructure, the former should be understood not only as the process or the result of its devising (a description, a model), but also

as a specific means, "a tool" in teacher's hands, which enables a teacher to organize the educational process as a certain technology and contributes to students' self-learning activities.

The results of experimental education (Aksyonova, 2013; Paschenko, 2013) show that the effectiveness of the IT infrastructure as part of undergraduates' self-learning activities is conditioned by the designing of the didactic computer (IT) environment (DCE) which, in the authors' opinion, comprises two levels: external and internal (Fyodorova, 2006).

The external level includes the following units: informational (theoretical), procedural (practical) and control-and-assessment-related. The first unit is presented as HTML pages containing the information for learning. These learning materials are divided into topics according to the course syllabus of a certain academic discipline. The contents of each topic are covered by the relevant text and visual materials which are presented as selected and systematized information taken from various educational sources, adapted for students and necessary to implement the procedural component of the DCE. The next unit contains a system of learning tasks aimed at estimating the learning progress and the workbook for doing those tasks. The system of learning tasks has three difficulty levels: reproducing, construction and variation, creativity, which, on the one hand, enables a teacher to estimate student's learning progress in a certain topic, and, on the other hand, gives the possibility to a student to demonstrate the relevant level of learning independence. The workbook helps a teacher to evaluate each student's knowledge and practical skills unbiasedly as well as to timely detect the difficulties which arise. The control-and-assessment unit of the DCI is introduced as computer-based tests used to determine the amount (percentage) of information learnt by each student, so, students are offered to get a realistic picture of their knowledge of a certain subject and to carry out their end-of-course self-assessment.

The internal level is presented by the computer software which performs a number of functions: it enables students logging-in to start working with the DCE as part of their self-learning, it provides the support for the external level units and it also gives the opportunity to grade students for the work done. The process of logging-in involves both levels of the DCE. A student chooses a certain academic discipline folder and signs up for it typing in the surname, name, patronymic, faculty, year and group in the notepad named "Student". It is reflected on the internal level, in the file named "Log" where an entry appears containing a student's surname, name, patronymic, faculty, year and group as well as the time a student starts working, the time spent, the relevant folder and unit. The DCE arranged like that, firstly, enables a teacher to keep track of students' self-learning activities through the logging-in procedure, to estimate each student's learning progress, to determine the difficulty level of the tasks done by students and to grade each student, thus, guiding the educational process. Secondly, the DCE offers students to choose the convenient time for self-learning, the proper unit they should address, the difficulty level as well as to evaluate their knowledge themselves, and so it pursues such educational goals as a personal approach, differentiation, active participation and learning independence.

7. Conclusion

In conclusion, it should be noted that the implementation of the approach considered in detail in this paper for professional training in a number of higher educational institutions in Russia proves that

this type of educational resourcing as part of higher education computerization is advantageous and can be recommended as a way to develop students' information culture.

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