THE USE OF MODERN INFORMATION TECHNOLOGY AS THE MEANS STUDENTS SELF-REALIZATION IN UNIVERSITY EDUCATION

Anatoli Mitrofanovich Gridchin, Elena Nikolaevna Shutenko, Andrey Ivanovich Shutenko, Vladimir Mikhaylovich Polyakov, Petr Ivanovich Ospishchev
Belgorod State Technological University named after V.G. Shuhov
308012, Russia, Belgorod, Kostyukova st., 46.

Received on: 15.10.2016
Accepted on: 12.11.2016

Abstract.

The article substantiates the necessity of modern information technology introduction in the educational process of a university as the stimulators of self-realization process among students. The authors demonstrate the attribute characteristics and modalities of student self-realization in higher education, a person-centered approach of information technology application in higher education is described. This approach activates a number of important functions. In particular, such features as descriptive, representative, exposure, the orientation and navigation, search and heuristic, imprinting, adaptive, communicative and interactive, coordination, structural and organizational, control and evaluation, logistics, diversification, accelerating, facilitating and innovative one. Together these features form a common information space of opportunities for student self-realization in the mode of subject-subject educational process.

Keywords: university, information technologies, student’s self-realization, attributes and modalities of self-realization, functions of information technology functions in education.

Introduction

The development of modern information and communication technologies (ICT) is of one of the driving forces for modern higher education. Many educators and leaders of a high school understand that the combination of digital technologies and resources provides more opportunities to expand the horizons and improve the quality of learning,
teaching and training than any previous school and TV educational technologies [1]. Today the level of informatization concerning the main areas of education, including higher education, reached such a depth and scale that a lot of new humanitarian problems and issues appears, which the prominent thinkers of our time mentioned a long time ago [2]. In the sphere of a high school informatization of high school, an important issue is the information technology application as the means of students' self-realization provision during high school preparation according to our view. It is no secret that the effectiveness of a university education in addition to the formal indicators of progress and attendance can be judged by the degree and the completeness of personal student potential implementation, their enthusiasm and the involvement in the preparation process. And in this regard, modern information technologies can play a significant role in training quality improvement, and in greater opportunity provision concerning the personalization of learning, the creation of conditions in order to implement the creativity and the potential of each student [3]. According to experts, the informatization of education at a present stage of a national high school development allows you to:

- develop an open education system that provides a personal learning path for each student;
- change radically the organization of learning process by moving it in the direction of a system thinking;
- create an effective management system for education information and methodological support;
- organize rationally the cognitive activity of students during the educational process;
- use the specific properties of a computer which allow to individualize the learning process and seek for fundamentally new cognitive tools;
- create, develop and improve the system of distance education at various levels [4].

Besides, the use of modern information technologies in education can help solve the following important didactic task:

- To study the phenomena and the processes in micro- and macrocosm, inside the complex technical and biological systems through the use of computer graphics and computer modeling;
- To present various physical, chemical, biological, social and other processes in the visual form with a more accurate reliability in a time scale more convenient for study [5].

The analysis of specific scientific literature demonstrates that the use of new information technologies provides:

- the intensification of all levels of educational and socio-cultural processes in a university training system;
- the multifaceted development of a trainee in the educational process;
At the same time, humanitarian and educational ICT resources are not studied in literature, a whole layer of socializing and teaching ICT functions as a tool of integral and continuous educational process development remains unrevealed.

**Study development methods and structure**

In our view, an urgent task of a high school informatization study, is to tie the possibility of modern information and communication technology application with the process of student self-realization in training. This article is devoted to the solution of this problem, the aim of which is to identify the major functions of information and communication technologies, stimulating the manifestations of various forms and modalities for student self-realization.

In our study, we proceeded from the hypothesis that student self-actualization process in terms of university training informatization (besides the abilities to learn and supportive learning environment) depends on the development of information and communication space for training. Moreover, this space should help students to design their professional career, to supply them with all the necessary technologies and information resources for self-development. It is obvious that the modern successful self-realization of students depends mainly on the availability of sustainable and high-grade information and technological "corridor of opportunities", which is organically consistent and meets the basic cultural norms and values presented in educational process [9].

The ability to develop this hypothesis is provided by the use of a socio-cultural approach to a high school informatization problem, which considers the use of information technologies as the means of student potential disclosure and realization, absorbing the specific historical forms of social and cultural relations [10]. Presenting the synthesis of knowledge, skills, abilities, talents, etc., driven by the interests, aspirations, expectations and meanings, these essential powers are added in the process of cultural experience acquiring by an individual through the mechanisms of this experience disobjectification and objectification in social practice. [11]

In a series of issue studies concerning a high school preparation in the framework of the strategic development program at BSTU named after V.G. Shukhov in 2012-2016, as well as within the project number 15-06-08802 of the Russian Humanitarian Scientific Foundation we carried out the complex of socio-psychological procedures and techniques in various universities of RF Central District.
From the student point of view the methodical task of the study was to identify the important background and varieties of student self-realization in training, including their personal characteristics, as well as the possibilities of information technologies to provide the appropriate conditions for this.

In order to solve the abovementioned problem the research work was carried out, which consisted of three stages. The first stage was devoted to the identification of students subjectively meaningful conditions for self-realization and the establishment of basic attribute signs for their self-realization during a university preparation. The second stage was associated with the study of student intential features realization and the various forms of their manifestation through social and psychological methods. The third stage consisted in the compilation of the obtained data about the signs and forms of student self-realization and the simulation of information technology respective functions on this basis. The study involved 100 students from the humanitarian university and 100 students from the technological university (Belgorod, Russia), the total amount of students made 200. During the study, they involved the students of senior courses (4-th and 5-th) studying at Belgorod State National Research University within the following faculties: the Faculty of Psychology, the faculty of Roman and Germanic Philology, socio-theological faculty, the faculty of municipal management and business and the faculty of medicine (28 boys and 72 girls). The study was conducted at Belgorod State Technological University named after V.G. Shukhov among the students of the 4-th and 5-th courses of the Institute of information technologies and control systems, transport, technological and chemical-technological institutions, as well as the architectural and construction institute the amount of which made 100 persons (71 boys, 29 girls).

The collection of empirical data was carried out by the development of a complex methodological research device, combining sociological and psychological methods. The main methods were: a pilot survey, observation, interviews, focus group method, a sociological survey (questionnaire), complex social and psychological testing (the application of a series of tests and questionnaires). Statistical methods: the analysis of difference reliability (according to Student's t criterion), the correlation analysis (rank correlation coefficient by Charles Spearman).

**Main part**

The opportunities and the risks of information technology se in a university. The potential of new information and communication technologies (ICT) in higher education offers the following key features:
The improvement of methodology and selection strategy selection concerning the content of education, the introduction of innovations in traditional discipline learning;

- The improvement of study efficiency, individualization and differentiation, the organization of new forms of interaction in a learning process and the changes in the content and the nature of a teacher and a student;

- The improvement of educational process management, its planning, organization, control, the modernization of education system control mechanisms [4; 12].

Meanwhile, the educational opportunities of modern ICT, as well as any learning tool, are fully disclosed and implemented if they are an organic instrument of personality structure and the pupil opportunity development [3]. These technologies alone are not a panacea in education, and their implementation in higher education is accompanied by its own difficulties. According to the experts, their application is associated with all sorts of risks. Most of these risks are associated with the mechanical transfer of the latest ICT in educational practice without a proper adaptation of these technologies on the one hand, as well as with philosophical and methodological adjustment of the educational process, on the other [13]. The idea is the following one: if the informatization of education is implemented in the logic of a former dominant paradigm of explanatory and illustrative teaching, all the costs of the latter will be brought to the point of absurdity, and education will become a simple load of consciousness without the development of personality structures and creative intellectual activity. Besides, there is the danger of a teacher activity devaluation, whose role can be reduced to the banal maintenance of these technologies [7].

Scientists warn that if we apply the full power of the latest information technologies, for example, in the utmost individualization of learning in line with a previous training model to the detriment of collective forms and dialogical methods of interaction development, it would destroy the very core of the learning process, which in its essence is the process of live communication. Besides teaching problems the reduction of social contacts may lead to individualism development [5].

Therefore, the conclusion to be drawn in this regard, is that a simple mechanical incorporation of ICT in the habitual educational process can not lead to the revolution in education [14]. It is necessary to change the concept of the educational process, in which these technologies would fit as a natural means of learning. The benefits and the opportunities created by the means of these technologies should be aimed at the creation of a holistic thinking and outlook among students.
According to experience and research data, the informatization of education provides the challenge to rooted pedagogical theories and practices [5]. And above all, we are talking about the loss of unconditional monopoly by a teaching community concerning the information and knowledge, the loss of control over resources and the training information flows. Hence there is an urgent need of educational paradigm change. A different model of an open one-directional subject-object training instead of an old one-way subject-object preparation model, the model in which a student and a teacher would act as active and creative partners of professional education process [13].

**Self-realization of students as a value and the task of information technology application.** One of the main problems concerning traditional education is to establish a continuous didactic process within discrete, time-limited periods of training, exciting the entire personality of a student, who would be able to find a better way of life and professional fulfillment [15]. Many innovations and reforms tried to expand the didactic space and time, to bring the learning process beyond the narrow limits of studies in the field of independent work of students in order to organize and manage their learning activities outside a high school schedule. However, generally these attempts had rather poor results.

Nowadays a real opportunity appears in order to solve this problem with the development of a new generation of information and communication technologies concerning online training based on the use of Internet resources (D.M. Willows, H.A. Houghton et al.). On the basis of these technologies various practices of media education appear that serve the development basis for media pedagogy and media didactics. The main advantage of these technologies is that they allow you to control the learning process remotely, providing a student with necessary training tools, information and communications, stimulating his high personal involvement and self-learning activities.

Nowadays most students choose online training in many high schools. Noting this fact, A. Bates identified four key points in the higher education of the United States: the development of online education, the acceleration of this growth, the increase of distance learning and its commercialization, as well as the issue of quality distance learning outcome provision within higher education.

So, the recruitment for distance learning courses in the United States increased by 21% from 2009 to 2010, as compared with a 2% increase in the total intake of students to the universities. More than 80% of American students are guided by the selection of online courses in 2014, as compared with 44% in 2009 [16].

The major tasks of information technology application in the educational process of a high school should include the tasks of terms provision for a full self-realization of students in the educational space of a university. This goal stems
from the very structure and the purpose of a high school as an institution of socialization and personal development, the development of competent professionals and capable members of society.

Attribute signs of student self-realization. In the course of our research we revealed clear signs and varieties of student self-realization manifestation in the course of high school preparation [17]. After data summary data we formulated a number of typical behavioral and attitudinal characteristics, which, according to the opinion of students and teachers, have the most successfully realized high school students. These features and characteristics are designated as the attribute signs of self-realization, among which the following ones were specified:

- the manifestation of personal qualities in training, the ability to express oneself, to discover one's strengths;
- self-learning, self-leadership and the focus on the domestic potential of training;
- the achievement of subjectively meaningful results in studies, the desire and the ability to be successful;
- an active nature of study, the manifestation of activity in educational process;
- the understanding of learning activities, the implementation of semantic relations in education;
- the creative element in training, the opportunity of experiment, the discovery of new knowledge, ways of knowledge and activity;
- versatile nature of teaching, flexibility and variety of cognitive activity educational forms in the course of high school preparation;
- inner responsibility, a conscious approach to employment, the readiness self preparation to a high school;
- the commitment to training, the availability of a goal in life and its achievement by the means of training at a high school;
- strong interest in learning, personal interest in preparation, the desire to know more;
- personal efforts in training, willingness to overcome the difficulties and obstacles during the preparation;
- cooperation in education, dialogical nature of communication, the pursuit to harmony and trust, communication culture.

Modal signs of student self-realization. In addition to attribute symptoms, we also determined the typical forms of student self-realization, which were identified by us as the modality of self-realization. These modalities reflect the stable intentions and the ways of student self-manifestation in various areas of university life. The list of selected modalities is shown on Figure 1.
**Fig. 1.** Modal signs of student self-realization in university preparation.

The figure shows that among the most pronounced forms of student self-realization the following modalities are distinguished:

- Cognitive modality is associated with the desire for study and knowledge, with cognitive activity;
- Communicative modality reflects the forms of self-expression and self-manifestation in constant communications and relations and in interactions;
- Creative modality means creative self-realization plan associated with productive and creative forms of activity;
- Fame modality (From English fame - notoriety) reflects the public vector of self-realization associated with the desire to gain fame;
- Pragmatic modality relates self-realization connects with a profitable and useful activity that brings certain dividends;
- Practical modality reflects the operational nature of self-realization, which is manifested in practical actions and work;
- Influential modality involves self-realization by the means of influence and impact on others;
- Pugnacious modality is the manifestation of oneself in a fight, in the overcoming of obstacles;
- Dedicatory modality (from English dedicate - to devote oneself) implies a wholehearted commitment, a voluntary service, a self-consecration to some case.

<table>
<thead>
<tr>
<th>Student self-realization modalities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>cognitive</strong> (to realize oneself in study)</td>
</tr>
<tr>
<td><strong>communicative</strong> (to realize oneself in communication)</td>
</tr>
<tr>
<td><strong>creative</strong> (to realize oneself in creation)</td>
</tr>
<tr>
<td><strong>fame</strong> (to achieve fame and glory)</td>
</tr>
<tr>
<td><strong>pragmatic</strong> (to get benefits)</td>
</tr>
<tr>
<td><strong>practical</strong> (to realize oneself in work)</td>
</tr>
<tr>
<td><strong>influential</strong> (to make influence, impact)</td>
</tr>
<tr>
<td><strong>pugnacious</strong> (to realize oneself in a fight)</td>
</tr>
<tr>
<td><strong>dedicatory</strong> (to realize oneself in a service)</td>
</tr>
</tbody>
</table>

---

Anatoli Mitrofanovich Gridchin* et al. /International Journal of Pharmacy & Technology

**IJPT| Dec-2016 | Vol. 8 | Issue No.4 | 22687-22700**

Page 22694
In the case of information technology application at a university it is important to consider and understand the major attributes and modalities of student self-realization as they reveal those invisible internal development trends and the forms of these technologies application in terms of personal ways activation and facilitation and the means of training content and cultural experience development in higher education.

The main functions of information technologies in higher education

The specified attribute and modal signs of student self-realization have conditional, indicative value and can vary considerably depending on the characteristics of educational practice and personal characteristics of students.

At the same time, in order to introduce the information technologies in the educational process, we believe it is important to take into account such features as this implementation should be holistic and provide a real way out of a high school educational system to the design and the implementation of individual learning path. To successfully accomplish this task, We believe it is necessary to identify and activate the corresponding application functions of information technologies at a high school for a successful implementation of this task. It is clear that modern information technologies can not be transferred directly and integrated into the educational process. Moreover, not all of them and not always can be used in training. For their use in education, they have to go through a kind of "psychological-pedagogical filter", by which we mean the deployment of certain set of functions. Personality-developing and information-educational environment may be created on the basis of these functions implementation, which orients students to self-actualization in training and provides significant opportunities for the successful development of a chosen profession.

Despite the fact that the current literature and research is dominated by the belief in the big advantages and the possibilities of modern information technologies in education, the issues of these benefits in terms of real personality development provision within the educational process remains open. The technical aspect of ICT use in teaching is characterized and developed really well, in contrast to the didactic and psycho-pedagogical aspect. Nowadays, there are no clearly articulated ideas about the purpose and the role of ICT in the development of stable full knowledge and student competence, the productive ways of cognitive and creative actions [5].

On the basis of existing practices and approaches generalization in order to implement modern ICT in the educational process, we attempted to classify their functions in terms of the impact on the most important structures of student informative and educational activity. The totality of modern ICT possibilities in the development of students can be presented within the framework of the following functions.
The descriptive function of modern ICT is the possibility of a more complete, high-capacity, diverse, multimodal description of teaching material and training content for its assimilation by students in the process of preparation. The use of ICT in education allows to resort to various forms of material description, not only verbal, but also largely visual and dynamically developed ones.

Representative-illustrative function is directly related to the previous function, and means the way of teaching content representation in a variety of illustrative-reproductive patterns that can be created on the basis of modern ICT, significantly enriching and expanding the possibilities of necessary material perception and assimilation by students, reducing the time and human costs during training. The exposure function of modern ICT is closely linked to the descriptive and representative one, and reflects directly the possibilities of a holistic, authentic educational material presentation in the mode of exhibition and exposition study, the possibility of which is provided by the use of virtual reality and 3-D formats, and other advanced information technologies.

Navigation and orientation ICT function is performed to implement the orientation activity concerning the finding of an optimal route and advance trajectory in information flows and Internet by students in order to obtain the necessary data and information for teaching and educational purposes.

Search and heuristic function follows from and is associated with navigation function, meaning the possibility of necessary data quick and comprehensive search, as well as revealing of new connections and relationships in the information space, the transition from unknown to known using ICT.

Imprinting function of modern ICT means that there is an opportunity for a holistic and vibrant information influence on the development of clear, stable images and patterns without a prior preparation of students, when necessary information is imprinted as a finished product with minimal efforts on the part of trainees.

Adaptive function reflects an increased flexibility and accommodative possibilities of modern ICT concerning the adaptation and the fitting of its procedures, options, and other front-end platforms to student different requirements and educational needs.

Communicative and interactive feature is one of the main features of modern ICT, which represents the implementation of a wide and a branched range of contacts between students and teachers in the information-educational environment within the framework of various formats and relations, as well as the provision of various levels and modes of interpersonal communication in educational professional needs.
The coordination function is the ability to manage and harmonize various information flows and data within the educational treatment using modern ICT, as well as the coordination of their actions in the information environment with the actions of other entities within the solution of educational problems.

Structural and organizational function of ICT is associated with the previous one and implies the possibility of structuring and the organization of diverse, fragmented and incoherent information from various sources and resources in an available educational construct for its development and use in the course of vocational training in a university.

Control and evaluation function of modern ICT is the provision of control and monitoring expanded by parameters and continuous by time process concerning the implementation of training, educational and other activities by students, as well as the possibility of their self-control and the monitoring of educational task correct implementation. The logistic function is the provision of trainees with the necessary information in the course of the educational process using modern ICT, including the establishment of communication channels, delivery, transportation, storage, distribution, sorting and the presentation of relevant information and the information and training data array in the framework of educational and professional goals.

Diversification function means the provision of necessary variety of ways, modes, methods, formats and mechanisms for the obtaining of educational services by students using modern ICT in university preparation. Accelerating function reflects the overall ability of modern ICT in education, which consists in the strengthening and the deepening of teaching-information impact on students, as well as in the acceleration of all cycles and procedures concerning information operation.

Facilitating function of modern ICT (from Eng. facilitate - to assist, to facilitate, to promote) is developed as the derivative of all above described features and represents a significant facilitation and unloading of student teaching and learning activities using this kind of technology.

An innovative feature of modern ICT is expressed in educational process enrichment and upgrade through the introduction of new methods and means of teaching and training, in the admission of students to scientific innovation activity, as well as in the upgrade of the entire information cooperation configuration and space at a university.

**Summary**

The presented set of relevant features concerning modern information and communication technologies is aimed at the provision of student self-realization, covering different types of modalities shown by us (cognitive,
communicative, creative, pragmatic, practical et al.). However, the successful deployment of such information technology functions as a training means is fully achieved if they are used in a personal application of a high school preparation practice. These technologies are not a panacea in education, and their implementation in a high school is accompanied by its own difficulties. The personal measurement, in contrast to the other meanings of university training (professional, status and career, research, socializing, etc.) is presented as a set of values and priorities for a personal development of students in the educational process. It is aimed to provide a full self-determination and self-awareness, to expand the scope of student competencies, the development of their domestic responsibilities and a subject position in the course of a high school preparation [13]. The widespread introduction of ICT within the personal dimension of education should contribute to self-realization not only among students but also among university professors. The use of these technologies can promote the cause of an information "clearing" and the release of pedagogical resources to establish interpersonal pedagogical communication and the interaction between teachers and students as the subjects of educational process.

The informatization of education can significantly reduce the communication barriers due to the internal restructuring of content, mode, method and interaction configuration in the learning process [13]. We mean a gradual overcoming of explanatory-illustrative dominant. Practice shows that modern information technologies can broaden significantly the didactic space and time frames of a training session due to the intensification of its informative part in the mode of each student address enabling with the release of a teacher to perform the issues of educational problem setting, pedagogical monitoring, semantic adjustment, etc. And these are not all of the transformation features concerning the educational process, which are revealed with the use of modern ICT.

Meanwhile, the informatization of a high school cannot be carried out in a narrow technical format and assumes the access to a new task: from the individualization of learning to the personalization of education and student-affiliate training system. In this context, the development of modern ICT in a high school suggests not only a different philosophy and information handling and operation logic providing the content of teaching, but also a different model of communication at a university.

In organizational and didactic aspect the main difference is in the fact that all the necessary educational information of a new paradigm is presented in an open, expanded form and shall be issued to students prior to a course study, not in the course of its development in step dosed portions. An equal access to information for teachers and students allows to
ensure their partner, subject-subject relations with knowledge, bring them to a real dialogue, to the exchange of
generalized methods of activity, meanings and value.

The proper use of modern ICT allows to change substantially the nature of academic work, to rebuild its contents,
mode, rhythm, technique and philosophy in general. The prospect of some technical-teaching function transfer from an
information technology teacher, namely, the function of information provision is offered for the first time in the history
of education. The human resources released in such a way can be directed at the strengthening of an actual teaching and
the educational role of a teacher.

Conclusions

In general the functional model of information technology application in a university is developed in order to provide
the opportunities for student self-realization through the deployment of personality developing functions within these
technologies. Obviously, the introduction of new technologies in education does not guarantee the achievement of these
functions automatically and requires considerable effort and literacy on the part of educational process participants that
knowingly realize the subject-subject model of training. In this case, the application of modern technologies can lead to
the progress in preparation of, and the described functions may serve as the humanitarian criteria of new technology use
efficiency in higher education.

Acknowledgment

The reported study was supported by RFBR, research project No. 15-06-08802\16.

References

   Information Technologies in Education. URL: http://iite.unesco.org/publications/3214713/


   Institute for Information Technologies in Education. URL: http://iite.unesco.org/publications/3214716/

4. Robert, I.V., 2007. Theory and Methods of Education Informatization (Psychological-Pedagogical and


