DIDACTICAL DETERMINANTS USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN PROCESS OF TRAINING OF FUTURE SPECIALISTS

DYDAKTYCZNE DETERMINANTY WYKORZYSTUJĄCE TECHNOLOGIĘ INFORMACYJNO-KOMUNIKACYJNĄ W PROCESIE KSZTAŁCENIA PRZYSZŁYCH SPECJALISTÓW

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ABSTRACT

In the article the author touches upon the subject of significance of computer equipment for organization of cooperation of professor and future specialists. Such subject-subject interaction may be directed to forming of professional skills of future specialists. By using information and communication technologies in education system range of didactic tasks can be solved. Improving of process of teaching of subjects in high school, self-learning future specialists, motivating to learning and self-learning, the development of reflection in the learning process. The authors considers computer equipment as instrument for development of intellectual skills, potential and willingness of future specialists to solve communicative and communication tasks and problems on the creative basis. Based on results of researches the author comes to certain conclusions about the effectiveness of usage of computer technologies in process of teaching future specialists and their self-learning. Improper supplying of high schools with computer equipment, lack of appropriate educational programs, professors' teachers' poor knowledge and usage of computers have negative impact on organization of process of teaching disciplines in high schools. Computer equipment and ICT in general are the instruments of development of intellectual skills, potential and willingness of future specialists to solve communicative and communication tasks and problems. So, the formation of psychosocial environment of development of future specialist is multifaceted, complex and didactically important issue.

KEY WORDS: education system; future specialist; formation of ICT competence

INTRODUCTION

Information and communication technologies become invariant (unprecedented) tool attribute in all spheres of human activity. Computerization of life activity priorities and aims of each specialist (future, young, experienced) as fundamental requirement and nowadays challenge opens for us endless opportunities for mastering information science and skills in computer field and at the same time, on the other hand, makes us "voluntarily" integrate his consciousness in information and telecommunications systems, subordinates natural liberty of person to phenomena of artificial intelligence. How not to get lost in such world, how to get, let's say, benefit (e.g. material or creative and intellectual advantage) from existence in boiling psychosocial environment for future graduate of technical or pedagogical high educational institution?

Internet applications, multimedia, "web cases", remoteness and many other benefits of modern civilization not only contribute to the modernization and development of global educational environment, but also dictate their conditions, requirements, formats and eventually laws. This is the relevance of our research.

In our research, we rely on a number of scientific achievements and practical results of Ukrainian researchers. So, we take into account: developments in pedagogy and philosophy in high school (Andrushchenko V., Bekh I., Voloshchuk I., Kremen V., Lugovyi V. and others); professional training of future specialists (Bogdanova I., Kurliand Z. and others); definition of technology role in terms of European integration (Artiushyna M., Bazeliuk V., Lushyn P., Slisarenko O., Snitsar L., Solodkov V., Pukhovska L. and others); theoretical generalization and practical developments of usage of computer learning tools (Hurevich R., Hurzhii A., Zhuk Yu. Volynskyi V., Lapinskyi V. and others); recommendations of implementation of informational technologies and teaching of subjects by means of personal computer (Zhaldak M., Mashbyts Yu., Morze N. and others) and so on. Considering ICT as tool of development of global educational environment, we have also analyzed internet publications and articles of foreign authors, in which research problems of high schools.

Computer technology facilities, information and communication technologies in general are modernizing very fast. Their upgrade makes rebuild education and training activities

in high schools. So, achievements in ICT sphere influence on transformation of form and methods of realization of content of education, require new approaches in formation of education programs, restructuring and reconsideration on this basis of content of disciplines in high school.

Computerization of education, integration of local educational nets into international virtual space remain unsolved issue. Personal computer is used ineffectively; mostly for surfing the Internet. IBM is very slowly turning into machine-simulator, machine-tutor and machine-motivator for self-learning of future specialists. Among the main reasons are poor methodological internet base, absence of free and well-structured access to resources that can become helpers in education process, self-learning and activities with perspective of obtaining profession.

THE AIM
In the article we try to focus on some ICT priorities and appropriate determinants of formation of psychosocial environment for development of future specialists.

MATERIAL AND METHODS
To solve this urgent didactic problem we applied a number of methods, including: surveys teachers and freshmen, questioning; interviews and engaging in conversations, qualitative analysis of the educational process; methods of observation, self-assessment.

RESULTS AND DISCUSSION
Processes of education in high school nowadays can't be imagined without mastering achievements in information and communications technologies by teachers as well as by future specialists. Learning technologies and appropriate skills are tightly interconnected and, on the one hand, they play the role of mediators in transferring of knowledge to younger generation, and on the other hand, they act as means of individualized education.

Education environment of high school, which is developing due to ICT, requires modern technical facilities of learning, which is urgent need, fulfilment of which will give possibility to fully realize basic types of competences. It will lead to formation of professional skills of future specialists. It is recognized that among pedagogical technologies information and communication technologies contain huge potential of supplying educational activity of individual and his self-evaluation, approximate to adequate. Therein lies specificity and phenomenon of ICT. If we talk about formation of self-learning skills exactly ICT will accompany person during all life. Without competence approach to implementation of ICT into education process, without creation of algorithms of obtaining information literacy there is no point to talk about strategic directions of development of European integration processes.

In many our publications we point out the importance of usage of modern ICT in process of fundamentalization of knowledge. Such knowledge is necessary for formation and development of skills of establishing cause-effect relationship of processes and phenomena, for reality cognition, and also for conducting applied researches, practical training and cognitive activity in general. Actuality of our researches in ICT sphere is conditioned by "the state of modern education as social institute, which provides professional successfulness of young person and his or hers competitiveness on labor market; significant spreading of open forms of education, ICT, which are characterized by implementation and usage of the Internet, which determine usage of productive methods of work with scientific, educational and methodological materials; realization of concept of humanistic education <...>. Nowadays each higher educational establishment faces difficult multifactorial task related to formation and development of new informational education environment with considering requirements of social perspective. <...> The mean of reaching aims and also the mean of solving the problem if informatization of education is the systematical integration of ICT into different spheres of education [1, pp. 4–7]".

Based on the content analysis we came to conclusion that worldwide big hopes are pinned on ICT not only in economy or politics, but firstly, in education. In internet resource "Information and Communication Technology (ICT) and Education" [2] is stated that requirements of modern society give unique possibility for education system; traditional education (store and recall information about certain branches of knowledge), now must take up the challenge related to preparation of young people to integration and success in society and economy; continues the transformation of knowledge into new ideas and programs of person's life activity, new technology are tools, which can be used for improvement in most branches of education; information and communications technologies have the exclusive significance for the future of education.

In the publication "Use of Information and Communications Technology (ICT) in Education" [3] some peculiarities of usage of ICT and warnings are emphasized. In particular it is said that on the one hand modern achievements in information and communications sphere provide exciting opportunities for increasing quality of education (interactive education, software, open access to online libraries etc) and simplify the interaction between future specialists, teachers, employees of institutions and communities, on the other hand digital technologies can never exclude relationship between teacher and pupil (and it has decisive importance in educational process and development); educational process with usage of ICT has to be conducted under the guidance of qualified specialist experts in pedagogy and education in order to avoid damage, which can be provoked by influence of technologies, in process of education or development of future specialists.

Researcher Charles Buabeng-Andoh, examining resources related to problems of ICT, payed attention to computer competence of professors, future specialists, which is defined as ability to handle a wide range of computer applications,

which serve different purposes, however, the majority of professors have if not negative, then at least neutral attitude to integration of ICT into teaching and learning, because of the lack of appropriate knowledge and skills [4, p. 139].

Based on the result of our researches some conclusions as for efficiency of usage of computer technologies in process of teaching future specialists and their self-learning are made. Inappropriate supplying with computer facilities of higher educational establishment, lack of appropriate educational programs and lack of skill in handling and using them by teachers influence on organization of process of subject learning. At the same time, didactical tasks that can be solved by the means of computer technologies remain little-investigated.

Information technologies as systems of general pedagogical, psychological, didactical, methodical procedures of interaction of teachers and future specialists, of content, forms and methods, of information educational facilities ensures the formation of professionally important competences of future specialists.

Hardware components, which provide adequate task for education of future specialists, data input and output, as well as special software have exclusive value for information technologies.

In education process information technologies can be used as: a) trainer; b) tutor; c) device for simulation modeling; d) mean of diagnostic and control [5]. Usage of such information technologies favors formation of some professional skills and computer literacy in general among future specialists.

We should regard computer as a tool for mastering information technologies, as it is a tool for text preparation and its storage. Personal computer is also calculating device with lots of possibilities and tool for modeling. Lots of applications, such as text editor, plotter, graphic editor etc. ensure high quality performance of tasks.

Undoubtedly, introduction of computer technologies requires future specialists' mandatory knowledge of appropriate graphic programs and understanding of purpose of computer as tool for quick realization of creative ideas.

Nowadays various graphic editors and packages, development programs and demonstrations of multimedia products, text editors and programs of computer layout, pedagogical program facilities etc. give possibility involve to arsenal of graphic formalization and esthetic expression basic and complex geometric figures, which support vector and raster ways to create images. In the same time, it is possible to adjust and display rather complex lines of different thickness and texture, points of varied sizes. There is possibility of repainting and replacing colors, changing of their brightness and transparency. Designing fonts and working with graphic templates are available as well as experimenting with zoom, composition and layout, shadows etc.

Teaching of disciplines during classes (practicing skills and abilities educational/practical activity during seminars, trainings etc.) with usage of ICT has not become easier for teaching staff of higher educational establishment it

is caused by peculiarity of usage of computer technology facilities and their insufficient quantity. First of all, such computer technology facilities require high level of their usage and skills not only digitalize the content of subject, but also algorithmically create appropriate support for efficient teaching of future specialists. Concern about this matter was expressed by scientists more than once.

Methods and algorithms of data processing, and other text, graphic, video, audio information become more effective thanks to constant upgrading software and telecommunications, which are absolute attribute of modern personal computer. Computerization of education, in Yu. Mashbitsa's opinion, is related to necessity to solve triune problem concerning theoretical base of education, creation of technologies for computer education and psychoeducational designing of software [6], as, according to G. Selievko's definition, computer technologies are macro-technologies [7, p. 240].

Proficiency in ICT, professional usage of computer technologies facilities will protect professor against loss of classroom reality, so he will not remain beyond "here and now", beyond interactive processes, so he will not lose connection with future specialists during studies. In such conditions communication technology facilities become assistants-mediators in transmission of important professional information, forming necessary professional skills of future teachers. This is condition and requirement at the same time, because young generation, feeling freer in cyberspace, is capable to master ICT for editing and transforming information, use more professionally appropriate devices and mechanisms. Thus modeled new relationship between teachers, teachers and future specialists, among future specialists. The subject-subjectivity with such organization of educational environment in higher educational establishment goes beyond established vision. It forces mutual mastering of other (various, new) forms of teaching-learning activity.

During direct teaching in classroom, computer should be used with aim of modelling of imitational education, in process of which reflection processes are activated. Processes of teaching by means of ICT and students' self-learning, formation of their professional skills are complementary (conditioned synergically). However, it can lead to controversy during evaluation of future specialists' achievements in studies, which, besides, does not always lead to low educational results in mastering of subject content. Expected recognition of student's achievements, in form of marks, can mismatch student's self-evaluation. Here can be not human factor, but computer technology facility with its devices, mechanisms, packages and other software.

However, points discussed above do not mean that role of human factor in such educational process is decreasing. On the contrary, psychoeducational aspects of ICT usage, where computer is the main facility, require vigilance. As this main facility gives possibility to realize teaching and educational process by ICT means, it is what allows to realize much bigger processes in shorter time. For example, "education ↔ training", "demonstration ↔ imitation",

"modelling ↔ experimentation" etc. mentioned pairs of processes are not sustainable and unconditional, they can change depending on didactic tasks.

If we take the aim to improve the teaching of subjects, then lecturer bases on "modelling ↔ demonstration", that provides modelling of process of discipline content, with time he chooses computer technology that realizes fully the ideas of particular topic or subtopic. In such way, you can create diversified virtual reality, adapted according to similarity/difference of study groups in order to actualize involvement of each student into educational process.

When it is a question of individualization of teacher's (tutor's, trainer's) work, individual psychological peculiarities of perception of ICT and its tools should be taken into account. So not always pattern developments, as multimedia presentations, can meet requirements and needs. In similar circumstances problem, which occurred, can be transferred into category of task, unstereotypical solution of which can lead to absolutely new result. In such way, creativity potential of future specialists' will develop, creative task skills will strengthen, intellectual skills of perceiving and understanding educational information will improve, comprehend this information, discover links on interdisciplinary level, systematize and generalize learnt material etc. as the result, the content of specific disciplines will be mastered better. In a word, as A. L. Franzoni & S. Assar point out that it is didactic strategy, which is organized and systematized sequence of actions and resource usage, which professors use during teaching, the main purpose of which is to simplify learning for students [8, pp. 15–29].

Involving future teachers in researching activity (which requires flexibility in organization of such process) can strengthen their motivation. Wider process "informing/demonstrating" ↔ "imitation/experimentation" can be recognized as effective. In such conditions, reflective tension increases and vitagenic experience of listeners actualizes, set conditions and algorithms of cooperation of professor and future specialists submits to the main – educational results.

Today world many people reasonably consider ruthless, which destroys personality and eliminates confidence in the future. However, global information nets contain huge potential to promote integration processes in society by providing instant communication between people regardless of distance between them. The internet environment influences a lot on implementation of innovative educational technologies, proving new possibilities.

Future specialists much have such knowledge which resists negative impact of Internet environment on pupils. Future specialists should be taught to ponder over the content of information flows, for example, advertising. They also should be taught how to analyze, compare, check and doubt this data. Even one question "Why producers of alcohol beverages don't show terrible car accidents committed under the influence of alcohol, children born with horrible defects etc.?" can be enough to provoke healthcare reflection.

In order to actively involve future specialists in critical thinking about advertising, develop mechanisms of self-defense against psychological intervention, we use technology, which is in high demand among young people. It is a question of so-called demotivators (demotivating posters), which are macro-images, consisting of image in frame and inscription-slogan that comments it in quite strict canon. This peculiarity of demotivators is similar to specifics of advertisement posters, billboards etc. but the purpose is another – to protect, warn, make think, stop. Such images can be demonstrated during lections and seminars. They act as a kind of counter-advertising, have effect of destruction of advertisement myths, they are like ozone layer of consciousness, at the same time stimulate stormy reflection, explosions of emotions. Demotivators destroy stereotypes, can even influence on change of person's behavior, who was immersed completely in advertising reality, which is really a virtual phenomenon, which deprives of common sense, dulls vigilance. Demotivators also serve as mean of prevention of crimes and abuses. Their influence on formation of students' value orientations (value attitude to life, people, society) is undeniable.

CONCLUSIONS

The current state of development of education (existing and desired) defines means of computer technologies as irreplaceable for organization of common activity of professors and future specialists, as the realization based on information and communications technologies provides solution to many didactic tasks. Therefore, computer technology facilities are tools for development of intellectual abilities, potential and future specialists' readiness for solution on creative base of communicative, communication tasks and practice problems. So the perspectives of further professional activity of future specialists directly depend on development of computer macro-technologies and ability to use in order to achieve specific goals. High-quality preparation of such specialists is determined, on the one hand, by computer technology facilities and appropriate educational computer technologies and, on the other hand, determined by the needs of the economy, where multidisciplinarity of knowledge of specialists is there important factor.

REFERENCES

1. Hurevych, R. S., & Hordiichuk, H. B., & Konoshevskii, L. L. [et al]. Osvitnie seredovyshche dlia pidhotovky maibutnikh pedahohiv zasobamy IKT [Educational environment for preparation of future teachers by ICT means]. – FOP Rohalska I. O., Vinnytsia (Ukraine), 2011.

2. Information and Communication Technology (ICT) and Education. (n. d). Retrieved May 5, 2017, from: http://www.basiced.org/wp-content/uploads/Factsheets/Technology_fact_sheet.pdf

3. Use of Information and Communications Technology (ICT) in Education. (n. d). Retrieved April 28, 2017, from: http://download.ei-ie.org/docs/webdepot/ei_ict_principles.pdf

4. Buabeng-Andoh, Charles. Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2012, vol. 8, issue 1, p. 136–155. http://files.eric.ed.gov/fulltext/EJ1084227.pdf

5. Selievko, G. K. Pedagogicheskiie tekhnologii na osnove informatsionno-kommunikativnyh sredstv [Pedagogical technologies based on information communications facilities]. NII shkolnykh tekhnologii, Moscow (Russia), 2008.

6. Mashbits, Ye. I. Psikhologo-pedagogicheskiie problemy komputerizatsii obucheniia [Psychoeducational problems of computerization of education]. Pedagogika, Moscow (Russia), 1988.

7. Selievko, G. K. Entsiklopediia obrazovatelnykh tekhnologii (v 2 t., t. 1) [Encyclopedia of educational technologies (in 2 vols., vol. 1)]. NII shkolnykh tekhnologii, Moscow (Russia), 2006.

8. Franzoni, A. L., & Assar, S. Student Learning Styles Adaptation Method Based on Teaching Strategies and Electronic Media. Educational Technology & Society, 2009, 12(4), pp. 15–29.

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