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**INFLUENCE OF MODERN INFORMATION TECHNOLOGIES
ON THE QUALITY OF TWO-LEVEL SYSTEM OF THE HIGHER
ENGINEERING EDUCATION**

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Influence of Modern Information Technologies on the Quality of Two-level System of the Higher Engineering Education

The article deals with the influence of modern information technologies on the quality of two-level engineering training. There are some of the requirements of the EUR-ACE Framework Standards for Accreditation of Engineering Programs relating to the competence of specialists and relevant Bologna principles of II cycle higher education, the realization of which is impossible without modern information technologies and computer equipment. This kind of education is called the pedagogy of distance. We mean getting knowledge with the help of the best of traditional methods, means and forms of training, based on computer (multimedia) and telecommunication technologies. The basis of distance learning is a purposeful independent work of a student, which is controlled by the computer. A student often can choose convenient time and place of his/her work.

Key words: II cycle system of engineering education, bachelor, master, information technologies, distance education.

In accordance with international standards EUR-ACE Framework Standards for Accreditation of Engineering Programs concerning engineering education in engineering and technology should be prepared for the solutions of complex engineering problems, work individually and in groups applying knowledge in the fields of health, livelihoods and legislation concerning liability for engineering solutions. They should also have a good knowledge of management and business conduct and realize the necessity of lifelong learning. As for masters, they will try to solve innovative engineering questions, fulfill all requirements of the first cycle at a higher level, to act effectively as a team leader and work not only in national, but also international teams [5, p. 20].

Under complex engineering problems we understand a wide variety of engineering and other tasks that are beyond standard solutions and require abstract thinking, the original analysis, analytical approach and the corresponding modeling.

Innovative engineering questions are specialized and require more in-depth study of interdisciplinary basis and combination of fundamental and applied knowledge, also do not have clear solutions [5, p. 23].

The given requirements of the EUR-ACE Framework Standards for Accreditation of Engineering Programs concerning the competences of specialists correspond to the Bologna principles of the two-level higher education, the realization of which is impossible without modern information technologies and computer equipment determine the actuality of this article.

The important role of modern information technologies is noted by many domestic (Gurevich P., Shestopaluk A., Shevchenko P., Стефаненко P. and others) and Russian (Malygin E., Zolotareva N., Дохновська I., Krasnyansky M., Chuchalin A. etc) researchers.

The vocational education is reformed now on the basis of modern innovative technologies. According to R. Gurevich, the training of specialists in educational institutions more and more focuses on the needs of society, which is, in its turn, continuously on the move [3, p. 18].

Academician C. Goncharenko supposes that “post-industrial stage of development of civilization needs not only to raise the educational level, but also to form another intelligence, thinking, attitude to the production and technical, information, social realities, which change quickly” [2, p. 34].

The aim of the article is to consider the influence of modern information technologies on the quality of a two-tier system of engineering training.

In the beginning of the third Millennium the Informatization of the society comes into force of, thanks to which education strategy changes significantly and the wide use of information technologies becomes an important feature of this process.

The solution of such problems as scientific thinking, skills of self-study, analysis of new data, the ability to make scientific hypotheses and plan their

experimental verification are impossible without wide use of information technology tools. These resources really become new economic category, which determines the development of scientific and technical progress in the country.

The consequence of this development is the intellectualization of all sectors of economic activity. Mastering and using of information, computing and communication technologies is impossible without highly qualified professionals who have skills in modern hardware and software.

The education of specialists in engineering, which fully meets the requirements of rapid industrial development, relies on the higher education system and ensuring of the identical tools, technologies, information protection of engineers and students.

Rapid progress in the field of information technologies allows using personal computers as an effective learning tool. The automation of educational process is put into practice by using computer-based training programs, electronic textbooks, which are not only magnetic carriers, but also local and global computer networks.

This kind of education is called the pedagogy of distance. We mean getting knowledge with the help of the best of traditional methods, means and forms of training, based on computer (multimedia) and telecommunication technologies. The basis of distance learning is a purposeful independent work of a student, which is controlled by the computer. A student often can choose convenient time and place of his/her work.

The analysis of higher educational institutions activities found that in the conditions of distance education, information, receptive and reproductive methods together with the problem one are very widely used. Reading of the electronic versions of different textbooks, networking, training manuals, computer-based learning systems, laboratory remote workshops, electronic libraries, dictionaries, etc is understood by the problem method.

But, in turn, requires a rather complex process of reforming the educational system, as it is necessary to provide for and theoretically substantiate the stages of this activity (forms, methods, technologies). The creation of electronic courses, materials, development of technologies and organization of educational process in a

network is the task of pedagogical design based on the required detailed working out actions of teachers and students in the new information-focused environment.

Today the general typology of distance education courses, divides its specific characteristics depending on the purposes of academic disciplines, the level of education and age of the trainees.

Here is an example of Donetsk national technical University. Students of the third course of German technical faculty have a discipline “Computer systems of training and technical translation” during their study of German, which includes a wide usage of the personal computers and local area networks.

The aim of the discipline “Computer systems of training and technical translation” is to teach students to obtain and process texts of professional subjects, as well as to prepare them for real communication – daily-household and professional.

This aim is achieved through the use of authentic sources of professional literature in the German language and the use of multimedia learning tools. The issues, problems and technologies of engineering, the latest achievements in these areas are reflected in the texts.

This form of training of the future engineers NTF has the opportunity to plunge into the measurement of international cooperation and provides conditions for the activity and communication in the European professional society.

The effectiveness of distance education (DE) is connected with the achievement of the educational aims of modern society and new social-economic conditions of the higher school and science in general. Thus, the effectiveness of DE the degree of compliance of the received results of planned objectives and tasks of the educational process in the face of prepared properly graduate of higher technical educational institution

Professional knowledge loses their actuality very quickly because of global progress in various fields of human activity.

So, the results of social progress, previously located in the technosphere, today concentrated in infosphere. World telecommunication infrastructure enables mass lifelong learning, which does not depend on the temporal and spatial zones.

Be aware of the latest events help to modern information technologies, which allow the students distance education. Such training activities increase the effectiveness of independent work makes this a continuous process, and gives new opportunities for creativity, for finding and fixing various professional skills, and allows teachers to use new forms and means of education, the conceptual and mathematical modeling of phenomena and processes.

All above-mentioned aspects make significantly influence on the competitiveness of graduate of higher technical educational institution and improve educational processes in Ukraine. But the analysis of scientific works had insufficient level of readiness of problem of formation of professional competitiveness of graduates of engineering profile in the international labour-market, which leads to further research in this area.

References

- 1. Стефаненко П. В.** Дистанційне навчання у вищій школі : монографія / П. В. Стефаненко. – Донецьк : Дон НТУ, 2002. – 400 с.
- 2. Гончаренко С. У.** Методика навчання і наукових досліджень у вищій школі / С. У. Гончаренко, П. М. Олійник, В. К. Федорченко та ін. ; за ред. С. У. Гончаренка, П. М. Олійника. — К. : Вища шк., 2003. – 323 с.
- 3. Гуревич Р. С.** Інформаційно-телекомунікаційні технології в навчальному процесі та наукових дослідженнях: навчальний посібник для студентів педагогічних ВНЗ і слухачів інститутів післядипломної педагогічної освіти / Гуревич Р. С., Кадемія М. Ю.– Вінниця : ДОВ “Вінниця”, 2004. – 366 с.
- 4. Малыгин Е. Н.** Новые информационные технологи в открытом инженерном образовании : учеб. пособие / Е. Н. Малыгин, М. Н. Краснянский, С. В. Карпушкин, В. Г. Мокрозуб, А. Б. Борисенко. – М. : “Издательство Машиностроение-1”, 2003. – 124 с.
- 5. Международные** требования к качеству подготовки инженерных кадров // Серия: Обеспечение проектирования образовательных стандартов и основных образовательных программ национальных исследовательских

университетов / авт. сост. : Золотарева Н. М., Дохновская И. В. – М. : НИТУ “МИСиС”, 2012. – 72 с.

6. Чучалин А. И. Качество инженерного образования : монография // А. И. Чучалин ; Томский политехнический университет. – Томск : Изд-во Томского политехнического университета, 2011. – 124 с.

7. Eur-ace-framework-standards [Электронный ресурс]. – Режим доступа : <http://www.enaee.eu/eur-ace-system/eur-ace-framework-standards>

Рогова В. С.

Вплив сучасних інформаційних технологій на якість дворівневої системи вищої інженерної освіти

В статті розглядається вплив сучасних інформаційних технологій на якість дворівневої системи інженерної підготовки. Наведені вимоги EUR-ACE Framework Standards for Accreditation of Engineering Programmes щодо компетенцій фахівців відповідають Болонським принципам дворівневої вищої освіти, реалізація якої не можлива без сучасних інформаційних технологій та комп'ютерної техніки. Освіта такого роду називається в педагогіці дистанційною. Ми маємо на увазі отримання знань за допомогою кращих традиційних методів, засобів та форм навчання, які, в свою чергу, засновані на комп'ютерних (мультимедійних) та телекомунікаційних технологіях. Основою навчального процесу при дистанційній освіті є цілеспрямована самостійна робота студента, яка контролюється комп'ютером. Часто навчаючий може вибрати зручний для себе час та місце роботи.

Ключові слова: дворівнева система інженерної освіти, бакалавр, магістр, інформаційні технології, дистанційна освіта

Рогова В. С.

Влияние современных информационных технологий на качество двухуровневой системы высшего инженерного образования

В статье речь идет о влиянии современных информационных технологий на качество двухуровневой инженерной подготовки. Приведены некоторые требования EUR-ACE Framework Standards for Accreditation of Engineering Programs, касающиеся компетенций специалистов и соответствующие Болонским принципам двухуровневого высшего образования, реализация которых, в свою очередь, невозможна без современных информационных методов обучения и компьютерной техники. Образование такого рода называется в педагогике дистанционным. Мы имеем в виду получение знаний с помощью наилучших традиционных методов, способов и форм обучения, которые, в свою очередь, основаны на компьютерных (мультимедийных) телекоммуникационных технологиях. Основой образовательного процесса при дистанционном образовании является целенаправленная самостоятельная

работа студента, которая контролируется комп'ютером. Часто обучаемый может выбирать подходящее время и место работы.

Ключевые слова: двухуровневая система инженерной подготовки, бакалавр, магистр, информационные технологии, дистанционное обучение

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