

- exchange of experiences, opinions, advice, friendly lessons.

You must also create a system of training and mastering of school teachers who have provided their preparations for the innovative in its form activities with children and youth. Moreover, school teachers should:

- find in the local environment the negative educational standpoint factors that affect students or those who may have such influence (e.g., family structure, economic situation, educational atmosphere);
- increase pedagogisation of parents, deepen their knowledge in the etymology of mismanagement of public life and the various addictions;
- eliminate factors that complicate the proper students' development, and counteract the potentially harmful impact by strengthening the educational system, especially through the organization of children's and young people's leisure and their involvement in therapeutic activities and social therapeutic groups.

Thus, on the basis of the investigated, we conclude that the work of school teachers is closely related to the educational process, found out that through the consolidation of selected essential features of students' value orientations the formation of their self-esteem takes place. This process is not possible without the active involvement of teachers. Consequently, teachers are required to create appropriate social space for the child's development, the condition of which is to provide freedom

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THE PECULIARITIES OF HIGHER ENGINEERING SCHOOLS FUNCTIONING IN THE PROCESS OF THE MAIN IDEAS OF THE THEORY OF DIDACTIC UTILITARIANISM IMPLEMENTATION IN THE USA

The system of higher education in the USA is characterized. The leading teaching methods are highlighted. The essence of the concept of didactic utilitarianism is shown. The most characteristic features of higher engineering schools functioning in the process of implementation of the main ideas of the theory of didactic utilitarianism in the USA are singled out. The basic tasks of education in engineering institutions are formulated. The most characteristic features of the educational process are defined. The basic principles of the curriculum according to the utilitarian concept are considered.

Keywords: *engineering education, the theory of didactic utilitarianism, curriculum, active learning methods.*

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ОСОБЛИВОСТІ ДІЯЛЬНОСТІ ВИЩИХ НАВЧАЛЬНИХ ЗАКЛАДІВ ІНЖЕНЕРНОГО ПРОФІЛЮ З РЕАЛІЗАЦІЇ ІДЕЙ ТЕОРІЇ ДИДАКТИЧНОГО УТИЛІТАРИЗМУ В США

Охарактеризовано систему вищої освіти США. Висвітлено провідні методи навчання. Визначено суть концепції дидактичного утилітаризму. Виокремлено найбільш характерні ознаки діяльності вищих

навчальних закладів інженерного профілю щодо реалізації ідей теорії дидактичного утилітаризму. Сформульовано основні завдання навчальних закладів інженерного профілю. Вказано найбільш характерні ознаки навчального процесу. Розглянуто основні принципи побудови навчальних програм згідно з утилітарною концепцією.

Ключові слова: інженерна освіта, теорія дидактичного утилітаризму, навчальний план, активні методи навчання.

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ОСОБЕННОСТИ ДЕЯТЕЛЬНОСТИ ВЫСШИХ УЧЕБНЫХ ЗАВЕДЕНИЙ ИНЖЕНЕРНОГО ПРОФИЛЯ ПО РЕАЛИЗАЦИИ ИДЕЙ ТЕОРИИ ДИДАКТИЧЕСКОГО УТИЛИТАРИЗМА В США

Охарактеризована система высшего образования США. Освещены ведущие методы обучения. Определена суть концепции дидактического утилитаризма. Выделены наиболее характерные признаки деятельности высших учебных заведений инженерного профиля по реализации идей теории дидактического утилитаризма. Сформулированы основные задачи учебных заведений инженерного профиля. Указаны наиболее характерные признаки учебного процесса. Рассмотрены основные принципы построения учебных программ согласно утилитарной концепции.

Ключевые слова: инженерное образование, теория дидактического утилитаризма, учебный план, активные методы обучения.

Topicality of the investigation. The topicality of the research is caused by the development of higher education and the recognition of its important role for the further growth of the society. In almost all the countries higher education is undergoing some reforms associated with the transition to innovative technologies. The USA is one of the countries that are developing rapidly. This rapid development of technology and the permanent updating of the techno sphere impose increasingly high demands on the engineering profession and engineering education.

The philosophy of pragmatism has made the significant influence on the formation of the main conceptual provisions of the American educational system (J. Dewey, S. Popper, T. Brameld, B. Sobel). The development of education in the United States, the problems of training and education of students were reflected in scientific researches of V. Zhukovsky, M. Shutova, J. Lebyd, L. Piskunova. In the scientific works of P. Luzan [3, p. 272], T. Ishchenko [1, p. 227], M. Khomenko [7, p. 194] the substantive and procedural aspects of the engineering staff training are highlighted and the experience of practical training of future engineers is analyzed.

The purpose of the article is to describe the peculiar features of higher engineering schools functioning in the process of the main ideas of the theory of didactic utilitarianism implementation in the USA.

The system of higher education in the USA is characterized by a high level of individuality. It takes into account the interests of each student, his/her intellectual and physical abilities. The theory of didactic utilitarianism has made the significant influence on the formation of the main conceptual provisions of the American educational system. The basic ideas of this theory in 20–30's of XX century became the theoretical basis of school policies and the activities of educational institutions in the United States. In comparison with the traditional system in higher engineering education in the USA the place of oral and written word took theoretical and practical training, where the student's independent scientific research is performed. The basic principle of higher engineering education institutes with the implementation of the ideas of didactic theory of utilitarianism in the USA is a synthesis of theory and practice. Education is not limited to the transmission of knowledge from a teacher to a student, but also includes the organization of practice and skill formation. Education is the creation of students' confidence in their own abilities. It creates not only the knowledge, but the skills of its application as well.

Specificity of higher engineering education with the implementation of the ideas of the theory of didactic utilitarianism in the USA is based on the experimental method. It helps the student-engineer «to formulate and solve problems by his own, to stimulate cognitive activity, to bind the exploration of the world with the personal experience». According to John Dewey a combination of training and education with life is performed by realization of the principle of combination of

education with practice. Therefore, in the center of an academic life should be the labour activity that promotes the active social work among the student-engineers [1, p. 43].

The core component in the educational process is a lesson. In higher engineering education the different age groups are created in order to enable communication skills of the students of all ages.

The curriculum in the higher engineering education in the USA is characterized by the fact that educational material for teaching is not subordinated to the subject and the sequence of basic forms, and activities are distributed according to the stages of human development.

Students follow the progressive development of mankind theoretically, illustrate it, and on labour classes recreate it by themselves. There are two most common approaches for constructing the curricula of universities and colleges in the USA: integrated and problematic. Nowadays, many universities and colleges prefer the integrated approach of building curriculum, which has several advantages: absence of course recurrence, all subjects are combined with the only-begotten purpose, the choice of teaching material is determined by the practical significance of the subjects, it includes theoretical unit that aims to transfer some systematic knowledge to a certain field.

According to this theory, in the engineering universities of the USA each student has the opportunity to acquire the training material according to his/her own abilities (no strict time limits are allocated to the study of a particular course). The curriculum of universities and colleges in the USA is elective. It represents required disciplines as well as elective courses. This makes it possible to take into account a wide range of students' interests. Each student, along with his academic tutor, has the opportunity to develop the curriculum for each semester, to coordinate and approve it in the dean's department. Lectures are not used as a primary source of information, but only direct the training that enables a student for a self-study and develops his critical thinking [5, p. 119]. Thus, the American system of education based, on the theory of didactic utilitarianism, is aimed to develop the skills of self-study and «teaches students how to gain knowledge».

According to the theory of didactic utilitarianism, the teaching process in the higher engineering education in the USA is based on active basis. It is very important to stimulate the students' personal interest in gaining knowledge that can be useful in life. Ideas of active learning are aimed to organize the development, self-organization, self-education and self-development of students' personality. The basic principle of active learning is that a student is seen as an active leader in the educational process, as the creator of his knowledge. The nature of interaction between teachers and students is changing. They become equal partners. The position of a teacher is changing as well: from a bearer of the ready-made information he becomes the organizer of students' cognitive activity; he reorients his educational work and the work of students in various forms of self-practice. A teacher becomes a co-participant of the research process, the adviser. The effective management of students teaching and learning activities is possible only when is based on their active mental activity.

Modern pedagogy requires from students not only the understanding, remembering and reproducing of the knowledge, but also the ability of applying it in a professional activity effectively. The methods of enhancing teaching and learning activities promote the achieving of this goal. They are aimed to develop students' creative independent thinking and the ability to solve professional tasks efficiently. The use of these methods provides a strong link between the theory and practice, the development of non-ordinary style of thinking, reflective sphere of thinking (self-awareness and self-regulation of the mental activity), the creation of the cooperation atmosphere, development of communication skills. Consequently, in American engineering universities during the learning process the active methods of learning are used [2, p. 139]. Let's consider some of the methods and techniques in details .

Brainstorming is a popular tool that helps to generate creative solutions to a problem. It is particularly useful when you want to break out of stale, established patterns of thinking, so that you can develop new ways of looking at things. It also helps to overcome many of the issues that can make a group problem-solving a sterile and unsatisfactory process. Used with the team, it helps you bring the diverse experience of all the team members into play during problem solving. This increases the richness of ideas explored and means that you can find better solutions to the problems you face. Students are thinking about a particular problem, and then they are free to express their opinions. All the statements are recorded on the blackboard, regardless of students' responses. A teacher only directs the students' opinions. One of the most important benefits of brainstorming technique is that

this method encourages creative thinking and generation of ideas is proceeded in a comfortable creative atmosphere. The activation of the mental activities of all the members of the process is realized. The members are deeply involved in the course of generation and discussion of the ideas, they learn new ideas in a more flexible way and feel themselves as equal members. Laziness, routine thinking, rationality, lack of emotional «spark» in realization of this technology will automatically disappear. Looseness activates intuition and imagination [6, p. 194].

The game design method is a game developing process of designing the content and rules of a game in the pre-production stage and design of a gameplay, environment, storyline, and characters during the production stage. Game design requires artistic and technical competence as well as writing skills. The Game design method significantly activates the learning of subject content. It fills that gap in the educational process which other teaching methods (such as verbal or practical methods) can not compensate, but it does not replace them. This technique enables us to be familiar with the peculiarities of the specific profession and promotes a sense of our own role in it. Moreover, this method helps in consolidating and deepening the knowledge gained during interviews, lectures, seminars, and practical lessons. It improves practical skills in solving professional problems, creates conditions for active experience exchange. The main function of these classes is to teach by action (the closer game activity is to the real situation, the higher is its educational and cognitive performance).

This method is characterized by the following essential features:

- availability of investigative, methodological problem or task, which teacher informs to students;
- division of the participants into small groups and their development of the solutions of the problem (task);
- conduction of the final meeting of scientific and technical council (or similar body), during which the groups publicly defend their developed solutions by applying the method of playing the roles [4, p. 255].

John Dewey's ideas were embodied in the Project System of Education that was developed in the 20's of XX century by William Kilpatrick. It was a form of Progressive Education organized curriculum and classroom activities around a subject's central theme. *The project method* rejects traditional schooling that focuses on memorization, rote learning, strictly organized classrooms (desks in rows; students always seated), and typical forms of assessment. The role of a teacher should be that of a «guide» as opposed to an authoritarian figure. Students should direct their own learning according to their interests and should be allowed to explore their environment, experiencing their learning through the natural senses. The core attribute of *the project method* is the development of cognitive and creative skills and abilities that require self-construction of knowledge and orientation in the information space. Project work focuses on applying, not imparting, specific knowledge or skills, and on improving student involvement and motivation in order to foster independent thinking, self-confidence, and social responsibility. So, the *project* can be defined as a collection of some actions, plans on creating real or theoretical objects, it always involves creativity. Due to this method, students can acquire such skills as:

- planning your work and predicting possible outcomes;
- using various sources of information;
- collecting and accumulating the teaching material;
- analyzing, comparing facts and arguing the opinion;
- taking best decisions;
- establishing social contacts (allocating responsibilities, interacting with each other);
- creating a «final product» – the tangible sample of the project activity (report, project, essay, film, calendar, magazine, brochure, script);
- representing the established material before an audience;
- assessing yourself and others [3, p. 32–33].

The basic premise of *constructivist theories* is that people create their own meaning through experience. In constructivism, students are encouraged to learn main ideas on their own through discovery learning. The understanding of the meaning of the material could be achieved only throughout the prism of own personality and throughout a stream of individual consciousness. Constructivism is the most popular method of training in American engineering universities.

Constructivists believe students to be active participants in the learning process [51]. Students can learn more if the teacher engages them in various activities, such as defining the problem, explaining the inexplicable, formulating the hypotheses, searching the solution. Delivering of a lecture, and proclaiming of the final results can lead to the decrease of the effectiveness of learning. In the classroom, the constructivist view of learning can point towards a number of different teaching practices. In the most general sense, it usually means encouraging students to use active techniques (experiments, real-world problem solving) to create more knowledge and then to reflect on and talk about what they are doing and how their understanding is changing.

Constructivism is a model of the student-centered learning when any questions are allowed. The opportunities to experiment, to conduct own analogies and draw conclusions are possible. From the perspective of learning effectiveness, constructivism requires from high school teachers to be attentive advisors, to help students to learn cognitive strategies, to organize information around great ideas that galvanize interest, to help students to develop their own vision, intuition, understanding the connection with the previous knowledge and experience. The ideas of the educational theory of constructivism enhance the learning process and the performance of each student. Constructivist teachers encourage students to assess constantly how the activity helps them to gain understanding. By questioning themselves and their strategies, students in the constructivist classroom ideally become «expert learners». This gives them ever-broadening tools to keep learning. With a well-planned classroom environment, the students learn *how to learn* [7, p. 10].

One of the most popular methods in American practice is *the situation analysis*. The purpose of this method is to teach students to analyze information, identify key issues, choose alternative solutions, assess the problem, find the best option and to formulate a program of action.

While analyzing specific situations, it is very important to combine individual work of those who learn with the problematic situation and the group discussion of the solutions prepared by each member of the group. This allows them to develop group skills, teamwork and it extends the opportunities of solving common problems within the academic subjects being studied.

Conclusions. Thus, education in the USA is seen as a process aimed at personal fulfillment. Taking into consideration demands of the new paradigm of education, we can conclude that the main task of higher education at the present stage is to educate an intelligent, creative person who is capable for continuous development and self-education. Using modern technology techniques, teachers should have clear ideas of their requirements for future profession and eliminate the contradictions between the requirements of training during the study process and in real professional activity. Students must be ready for those forms of work, which will take place in their professional practice. Among them are the ability to find the necessary information for a particular decision, and the ability to find creative solutions in the complex problematic situations. The only way of solving this problem is the usage of active and innovative learning technologies.

Prospects for further study of the realization of the ideas of didactic utilitarianism in practice lie in the comparative study of training programs for engineers' in the universities of the USA and Ukraine.

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