ORGANIZATIONAL AND PEDAGOGICAL FOUNDATIONS OF THE FORMATION OF PROJECT-DESIGN COMPETENCE OF STUDENTS OF THE ENGINEERING DIRECTION

Adilov Boburjon Baxridin o 'g 'li
Base doctoral student of Jizzakh Polytechnic Institute

Abstract. *This article highlights the organizational and pedagogical foundations of the formation of project-design competence of students of the engineering direction in the educational process of Higher Education.*

Keywords: *project-design, competence, engineering.*

ОРГАНИЗАЦИОННО-ПЕДАГОГИЧЕСКИЕ ОСНОВЫ ФОРМИРОВАНИЯ ПРОЕКТНО-КОНСТРУКТОРСКОЙ КОМПЕТЕНТНОСТИ СТУДЕНТОВ ИНЖЕНЕРНОГО НАПРАВЛЕНИЯ

Аннотация. *В данной статье освещены организационно-педагогические основы формирования проектно-конструкторской компетентности студентов инженерного направления в образовательном процессе высшего образования.*

Ключевые слова: *проект-дизайн, компетенция, инжиниринг.*

INTRODUCTION

In the process of substantiating the organizational and pedagogical conditions for the formation of project-constructive competence in the educational process of Higher Education, a number of (И. С. Булатова, А. О. Горнов ва Л. А. Шацилло, В. Ю. Елцова, С. Ю. Ситникова and others) authors should be taken into account separately. They paid special attention to the following shortcomings of engineering training: lack of systematic organization, lack of scientific relations with professional cycle science. Therefore, on the basis of modern approaches to teaching graphic sciences, it is advisable to take into account the possibilities of a systematic organization of engineering and graphic training, which involves the formation of professional, personal qualities of students of the engineering direction, while knowledge and skills serve as a single content of transformational activity. In addition, it directs the project-design competence of students of the engineering direction, including the understanding of the systemic vision of the subject of activity, to the potential of the system. All this leads to the consideration of the system for organizing the engineering and graphic training of students of the engineering direction in the conditions of the formation of project-design competence.

MATERIALS AND METHODS

The phenomenon of systematic organization of training is sufficiently studied in pedagogical science and is based on the general pedagogical principle of teaching, the consistency of its content and is aimed at assimilation in activity [1]. The systematic nature of the organization of teaching in general terms provides for the oriented formation of individual characteristics as an integral unit of logic, its components and the logic of thinking of future specialists [5]. At the same time, it is necessary to understand the logic of thinking of future specialists as a complex system education, which has a level of systematic formation, functioning and management. In addition, the structural nature of vocational training through structural (competency), technological (content of Educational Sciences) and parametric (types of training, number of hours, types of independent work, etc.).) characteristics allows to establish

inter-rule integration in accordance with the objectives and direction of training in order to achieve educational results.

In the process of forming project-design competence and based on the didactic principle, we consider that the compilation of the engineering and graphic training we have studied, according to which the presentation of the educational material is associated with the internal logic of teaching and must comply with the principles of systematicity and consistency [3].

The principle of consistency refers to the result of the educational process, the principle of systematicity and consistency makes it possible to consider engineering and graphic training in the system in a certain order, in the internal logic of educational disciplines, the next one, based on the previous one, makes it possible to master a new one. The considered principle of systematicity and consistency is combined with the principle of continuity, which is aimed at organizing engineering and graphic training in the process of forming project-design competence, taking into account interdisciplinary connections.

RESULTS

Based on the consistency of engineering-graphic training, we determine its characteristics:

- first of all, the engineering and graphic training system should be holistic, that is, the continuity of teaching, the continuity of formed knowledge, skills and abilities of project-design activities, organic interdisciplinary communication based on the final system of engineering education should be observed [4];

- the integrity of the engineering and graphic training of students of the engineering direction is manifested in the presence of a functional organization that correlates the goals of training with control influences in quantitative and qualitative terms.

Taking into account the impact of modern information and communication technologies on the educational and professional environment, the study of the content and organizational forms of engineering and graphic teaching allows us to come to the conclusion that engineering-graphic Educational Sciences enrich the composition with professionally oriented component based on modern information and communication technologies.

The involvement of students of the engineering direction in design and design activities is carried out through the following disciplines-drawing geometry and engineering graphics, architecture of industrial and fukaro buildings, computer technology in the design of construction structures, technology of construction processes. Table 1 presents several stages of the process of involving students of engineering direction in project-design activities.

The involvement of students of the engineering direction in project design and production activities is associated with the principles of systematicity, consistency and continuity in the formation of design and construction skills, which makes it possible to correctly distinguish this process into three stages –these are orientation, attachment and strengthening.

Table 1

Stages of the process of involving students of engineering direction in design and design activities.

Stage	Educational Sciences	Skills formed in project-design activities

Directing	Drawing geometry and engineering graphics	algorithm of plane displacement of spatial bodies in the drawing; design and implementation of drawings; solving engineering problems for construction on a geodetic surface using topographic research; Organization of the engineering idea in the form of a project; development of project-design documentation; interoperability and belonging of drawing elements to standards ; reasonable selection of graphic editors for project-design activities.
Combining	Architecture of industrial and fukaro buildings	demonstration of Architecture or constructive idea in the form of drawings; development of project-design documentation in construction; reasonable selection of graphic editor in the performance of the specified professional task; remote exchange of graphic information, compatibility of various graphic programs; project-constructive activity.
Strengthening	Computer technology in the design of construction structures, Construction process technology	three-dimensional modeling; intelligent parameterization of objects; isolation of project data corresponding to the objects; Organization of own project activities, selection of priorities taqsimlash, main and secondary activities; Organization of the workplace, including remote access, remote mode and group work on the project; project-the use of 3D visual format in the design activity.

The focused stage of involving students of the engineering direction in design and design activities is carried out in the study of the discipline" drawing geometry and engineering graphics " and is aimed at the formation of the motivational and cognitive component of project-design competence.

In the implementation of this stage, the importance of standardization and unification of engineering and graphic preparation in design and construction activities in professional activity; interest in project modeling as a result of independent implementation of geometrical drawings is manifested and the cognitive basis of this activity is laid.

In the process of implementation of the bonding phase, the cognitive component of the project-constructive composition is formed, the skills of architectural and constructive ideas in the form of drawings are formed, the skills of using digital technologies in construction are improved, the interest in architectural and constructive modeling is manifested by the self-awareness, creative possibilities of future engineers.

The stage of strengthening the involvement of students of the engineering direction in project-design activities is carried out in the process of studying the discipline "information modeling technologies in construction" and is enriched by interdisciplinary interaction with the disciplines of the professional cycle. In the process of implementing the strengthening stage, the cognitive component of project-design activity is enriched by studying information modeling technologies and introducing them into project-design activities, the activity component is improved by the formation of skills for organizing project-design activities, and the reflexive component of project-design competence is formed. The result of the strengthening stage of involving future engineers in design and design activities is further self-development directions in the professional field.

DISCUSSION

The development of their cognitive activity, the implementation of their goals in attracting students of the engineering direction to project-design activities, significantly changes the role of the teacher, including the organization of training, assistance, support, counseling.

An important role in the development of their cognitive activity in involving students of engineering direction in project-design activities is played by complex case technology, which represents an improved simulation-modulation method of problem education and implements the following principles:

- problematic, consists in the organization of the engineering task, the solution of which is carried out in the process of project-building activities using class, independent, distance education, which allows the student to take advantage of the cognitive potential;

-formation of a systematic view of the object of coherence, project-constructive activity;

- practical project-modeling of a professional situation with the development of constructive skills;

- communication, development within the framework of collective interactiontirishga contribution, ability to argue with one's own opinion, establishment of communication;

- individuality, which manifests itself in the adaptation of the educational process to the educational needs and capabilities of students of the engineering direction.

Having completed the identification and justification of the organizational and pedagogical conditions for the formation of project-design competence of students of the engineering direction in the educational process of a higher educational institution, we draw the following conclusions and note the results obtained:

- understanding of organizational and pedagogical conditions as a set of pedagogical situations aimed at achieving the result of education, taking into account adequate pedagogical

technologies, organizational forms, the use of tools, methods and the nature of the interaction of the subjects of the educational process and the content characteristics of its components;

- on the basis of a systematic approach and consideration of engineering-graphic training of students of the engineering direction in the internal logic and interdisciplinary interaction of educational disciplines, the first organizational and pedagogical situation is determined and substantiated - the systematic organization of engineering - graphic training of students of the engineering direction aimed at the formation of project-design competence;

- taking into account the impact of digitization of production and expansion of the role of modern information and communication technologies, the study of the content and organizational forms of engineering and graphic training allowed to determine and substantiate the second organizational and pedagogical condition - enrichment of the content of engineering and graphics, to teach subjects with professionally oriented component based on modern information and;

- analysis of the educational capabilities of pedagogical technologies aimed at the formation of project-design competence of students of the engineering direction made it possible to identify and substantiate the long-term process of involving students of the engineering direction in project-design activities, taking into account the third organizational and pedagogical situation-the context of professional training.

CONCLUSIONS

The organizational and pedagogical essence of the formation of project-design competence of students of the engineering direction in the educational process of a higher educational institution presupposes their joint and interdependent implementation in achieving the result of Education.

REFERENCES

1. Хамидов Ж.А. Использование мультимедийных технологий в профессиональном образовании // Среднее профессиональное образование, 68-69 11 2011
2. Hamidov J. A. Using Multimedia Technology Problems in Professional Education /
3. Bakhridinovich A. B. THEORETICAL BASES OF FORMATION OF DESIGN-DESIGN COMPETENCE OF FUTURE ENGINEERS IN THE PROCESS OF HIGHER EDUCATION //Web of Scientist: International Scientific Research Journal. – 2022. – Т. 3. – №. 5. – С. 1791-1795.
4. Алексеев, В.П. Системность как основа в развитии инженерного образования / В.П. Алексеев // Гуманизация образования, 2015. - №4. - С.15-22.
5. Асадуллин, Р.М. Педагогика субъектно-ориентированного образования / Р.М.Асадуллин. - Уфа : Изд-во БГПУ, 2016. - 131 с.
6. Rahimov B. S. Matematik tushunchalarni kiritish va tavsiflash usullari //Science and Education. – 2022. – Т. 3. – №. 5. – С. 951-956.