

FORMATION OF DESIGN-TECHNOLOGICAL COMPETENCE AS A CONDITION OF QUALITATIVE TEACHERS' OF TECHNOLOGY PROFESSIONAL EDUCATION

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Abstract

The article is devoted to the problem of improving the formation of design and technological competence of future technology teachers in the current socio-economic conditions. The essence and content of the concept of design and technological competence has been clarified, the tasks facing the system of training future technology teachers in the university have been defined. The components of design and technological competence are singled out; the pedagogical conditions of effective formation of the design and technological competence of the technology teacher in the process of vocational training are revealed and substantiated.

Keywords: design and technological competence, structure, content, components of design and technological competence, pedagogical conditions.

1. INTRODUCTION

The Higher School of Russia is guided in its development by the qualitative training of a specialist, corresponding to changes in the labor market. At present, one of the tasks of the higher pedagogical school is the preparation of a competent, competitive specialist who can solve professional problems independently and creatively. In this regard, it is necessary to raise the qualification of the students - future teachers of technology to a qualitatively new level, since they provide the transfer of elements of engineering and technical knowledge, skills, development of students' creative initiative and independence, design and rationalization skills.

The future teacher of technology should possess certain psychological, pedagogical, design and technological and special knowledge, skills and abilities, be able to manage technical creativity, manage project-based activities based on science, engineering and advanced experience, and own a research

apparatus. However, this requires expanding the range of knowledge needed for future technology teachers, for developing design and technological competence, identifying design and technological skills, and their subsequent formation.

2. OPINIONS AND DISCUSSION

The problem of the formation of various types of future technology teachers' competence in modern conditions has been devoted to a significant number of scientific papers. Meanwhile, in pedagogical science, there is no single conception of the influence of the technology teacher's technological competence on the readiness to guide the technical creativity of students.

Formation of competence as a significant quality of future specialists is based on a socially defined model (Raven, 2002). The impulse of activity to the system of formation of design and technological competence in the university gives a social order (socio-economic, professional and scientific requirements for a specialist). It determines the purpose of education - an ideal image of a specialist, which in turn influences the process of selecting and structuring the content of his education. The central place in the system is occupied by the student: he is not an object of pedagogical influence, an active subject, an equal participant in the process of professional education. In connection with this, the goal of the system is to improve the system of forming the design and technological competence of future technology teachers in the process of professional training.

Based on the analysis of the criteria for the effectiveness of vocational training, proposed by S.Y. Batyshev (Bashenkov, 2011), we have identified such components of design and technological competence as: value-semantic, cognitive, operational-activity, personal-creative.

The goal was specified by us through the following tasks:

- arming future technology teachers with design and technological knowledge, abilities, skills;
- formation of future teachers' needs and readiness for self-improvement in the field of design and technology literacy;
- education of professionally significant personal qualities;
- stimulation of cognitive activity of students and formation of the need for self-education.

The organization of this model was based on the following principles:

- the principle of integrity;
- the principle of systematizations, designed to provide the student with the conditions for mastering sufficiently deep theoretical knowledge, abilities and skills and developing professionally important personal qualities;
- the principle of competence approach to learning;
- the principle of transition from the student's educational activity to the professional activity of a specialist;
- the conditionality of the professional orientation of the content of education by future professional activities;
- the principle of unity of control and self-control of the process of formation of design and technological competence during professional training.

The theoretical direction of the university's activity in the formation of design and technological competence is aimed at mastering students of the faculty of technology and vocational education with general pedagogical and design and technological knowledge. We distinguish the following design and technological knowledge:

- theoretical knowledge in the form of general scientific, technical and economic educational information necessary for the implementation of the principle of polytechnics, which are formed in the process of studying general physics, higher mathematics, theoretical mechanics, descriptive geometry and drawing, technical disciplines of applied nature (the theory of mechanisms and machines, machine parts, resistance materials), etc.
- economic knowledge of a general nature forms courses: "Micro- and macroeconomics", "Fundamentals of market economy", "Fundamentals of marketing", "Fundamentals of management", "Basics of entrepreneurial activity", "Accounting and taxation", "Finance, banks" etc.
- knowledge of the modern scientific and technical foundations of production, the scientific organization of production processes, the bases of production at industrial enterprises, the specifics of production,

knowledge of the organization and economy of specific industries, the organization of productive work of students, etc.

The personal direction calls for the development of appropriate personal qualities:

- formation of students' installation for creative self-development;
- development of students' activity, their focus on professional activities;
- developing the reflective position of students;
- development of independence and responsibility;
- formation of technical and economic thinking and intuition, polytechnical outlook (Episheva, 2013).

The practical direction provides for the arming of future technology teachers with special design and technological abilities and skills.

- Design skills include the ability to: define and formulate the intended result of the forthcoming design activity in relation to the individual components and aspects of the design process (teaching and educational tasks, tasks of independent work, tasks of practical work, etc.); to determine the logic and sequence of work on the solution of the design problem; connect the ways of working with the content of the creative process and learning; to provide in advance constructive features and to foresee the technological ways of implementation, to think over the design and technological structure of the object or structure, its different variants for the same situation, to provide typical mistakes and shortcomings in the work of students; prepare for the application of different approaches to the solution of design and engineering tasks, and plan design and technological activities.

- Constructive skills are manifested in the development of effective technological, pedagogical and methodical processes. Students should be able to: select ready-made educational information (texts, illustrations, diagrams, tables, questions and assignments); create their own versions of educational information; to develop, create structural elements and construction as a whole; choose methods and techniques for implementing design and technological activities, forms and special means of organizing the creative process; to develop control texts, to think over possible variants of design and technological solutions for inclusion in independent educational and production activities, to take into account the peculiarities of the school, class, specific student, material and technical base in the design.

After analyzing the main requirements for the future technology teacher, we introduce the following definition of the design and technological competence of the technology teacher: design and technological competence is the integrative quality of the technology and entrepreneurship teacher that determines the teacher's readiness and ability to solve tasks arising in professional pedagogical activity using special design - technological knowledge, abilities, skills, professional experience and personal qualifications (Korotkov, 2012).

The formation of design and technological competence is a prerequisite:

- development of spatial representation and thinking;
- the formation of the ability to analyze, compare, generalize, independently acquire knowledge, creatively act in non-standard situations;
- the formation of skills in solving design and technological, creative and design tasks.

Therefore, before the system of training future teachers of technology in the university are the following tasks:

- the arming of future teachers of technology with design and technological knowledge, the formation of their design and technological skills;
- the formation of future teachers' needs and readiness for self-improvement in the field of design and technological literacy and the management of technical creativity;
- education of professionally significant personal qualities;
- stimulation of cognitive activity of students and formation of the need for self-education.

The solution of the above tasks is possible with the organization of purposeful work on the formation of the design and technological competence of future technology teachers in the university.

3. CONCLUSION

Thus, the design and technological component defines a set of new professionally important qualities, where creativity and creativity play a significant role in the readiness to direct technical creativity in future professional activity in the context of changing the priority of value-oriented installations, rejecting the primary orientation of education for knowledge and the transition of content education based on competence relevant and necessary condition for quality education future teachers of technology and business is the formation of engineering and technological competence.

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