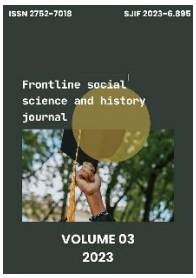
FRONTLINE SOCIAL SCIENCES AND HISTORY JOURNAL
(ISSN – 2752-7018)
VOLUME 03 ISSUE 05 Pages: 26-34
SJIF IMPACT FACTOR (2021: 5. 376) (2022: 5. 561) (2023: 6. 895)
OCLC – 1276789625
Publisher: Frontline Journals



Journal Website: https://frontlinejournals.org/journals/index.php/fsshj

Research Article

PEDAGOGICAL ESSENCE AND MODEL OF FORMATION OF INFORMATION AND TECHNICAL COMPETENCE IN APPLIED MATHEMATICS STUDENTS IN BACHELOR STUDIES

Submission Date: May 03, 2023, **Accepted Date:** May 08, 2023,
Published Date: May 13, 2023
Crossref doi: https://doi.org/10.37547/social-fsshj-03-05-03

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ABSTRACT

In the article, taking into account the possibilities of forming information-technical competence of applied mathematics bachelors of theoretical mechanics, its main didactic principles are defined, we reflect the essence of the educational process, that is, the theoretical approaches to the organization of the educational process and its management are revealed.

KEYWORDS

Formation, career-oriented approach, positive motivation, fundamental education, practical engineering problem, information and technical competence, digital technologies.

INTRODUCTION

First of all, if we focus on the concept of "formation" in our work and analyze it scientifically, the program will be applied in our work coverage. From the point of view of

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psychology, formation is the process of purposeful and organized acquisition of social subjects, integral, stable features and qualities necessary for them to lead a successful life, and is manifested in the step-by-step creation of operative behavior and consistent steps that bring them closer together.

LITERATURE ANALYSIS AND METHODOLOGY

In pedagogy, "shaping" means the use of techniques and methods of influencing a person to create a certain system of values and attitudes, knowledge and skills. In the process of formation, a person acquires the intended qualities [1].

Formation of information-technical competences of applied mathematics bachelors is aimed at professional self-development, increasing the level of formation of motivational-informational component and information-technical competence.

Taking into account the possibilities of formation of information and technical competence of applied mathematics bachelors of theoretical mechanics, we define its main didactic principles, reflect the essence of the educational process, that is, we reveal the theoretical approaches to the organization of the educational process and its management. It allows selection of didactic principles, reasonable determination of goals, selection of content of educational material, selection of forms, means and methods of teaching theoretical mechanics aimed at formation of information-technical competence [2].

One of the first didactic principles of training is timeliness and planning, conformity to nature, conformity to psychological characteristics, systematicity, development of activity and initiative, perseverance.

The system of modern didactic principles is related to the principle of consciousness and activity, appearance, systematicity and consistency, persistence, scientificity, usability, theory and practice.

Later as described by M.M. Manushkina, a person's motive is a need, intention, motivation, purpose, characteristic of a person that determines the activity of a person's behavior and the effectiveness of his activity.

RESULTS

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Applied mathematics students have relatively weak desire to study theoretical mechanics, so it can be seen from practice that the level of knowledge in this subject is low.

This situation can be changed by making theoretical mechanics a career. The greatest incentive to develop personal interest in studying theoretical mechanics is the career-oriented approach to education.

As a professional direction for the formation of information and technical competence, on the one hand, theoretical mechanics teaching is oriented towards the profession, it organizes tasks that solve problems related to the profession and model the types of professional activities, on the other hand, it requires the use of modern practical programs required for solving general technical problems.

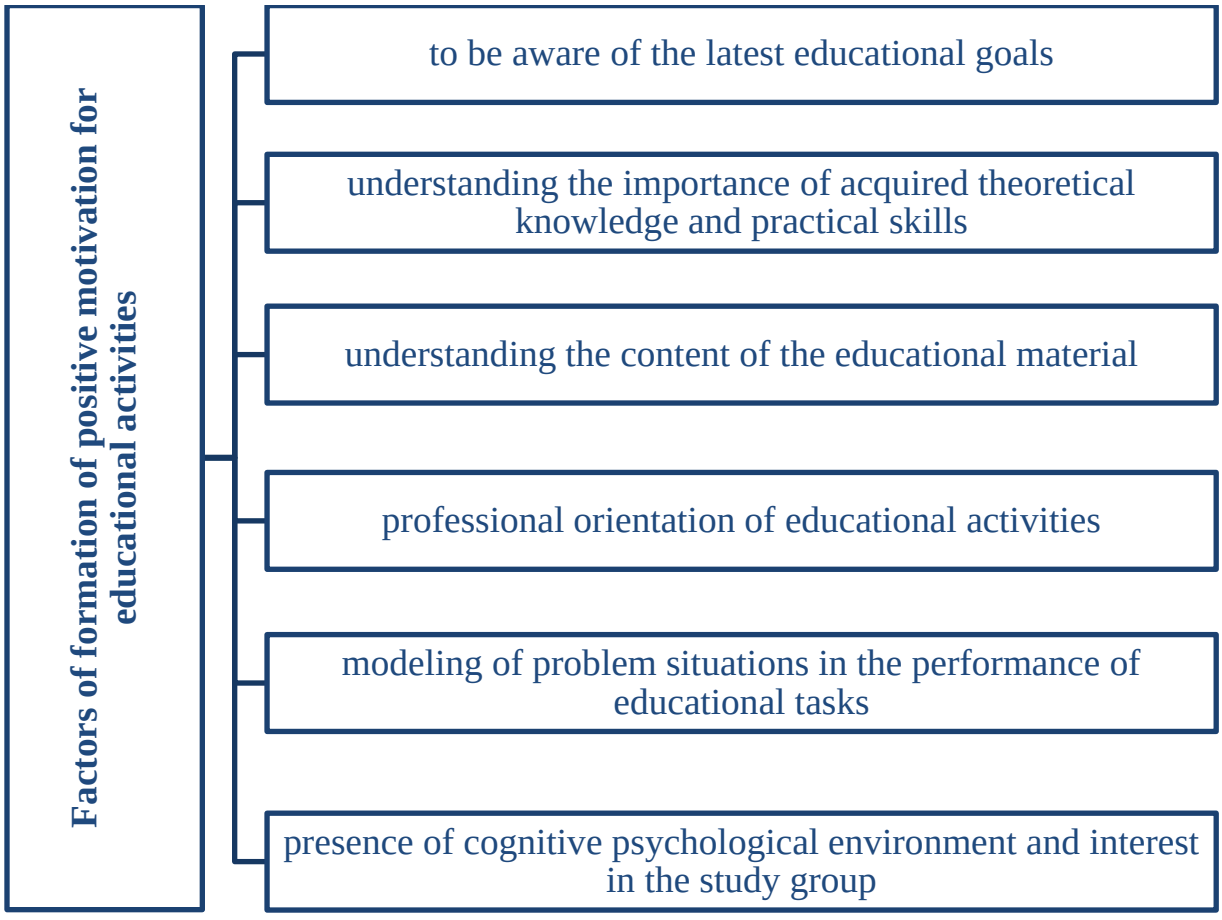

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Table 2.2.1. Factors of formation of positive motivation of students.

As a professional direction for the formation of information and technical competence, on the one hand, theoretical mechanics teaching is oriented towards the profession, it organizes tasks that solve problems related to the profession and model the types of professional activities, on the other hand, it requires the use of modern practical programs required for solving general technical problems.

DISCUSSION

The principle of vocational orientation of education was initially developed in the pedagogy of vocational education and still plays a leading role. This, in turn, implies the first principle of formation of information-technical competence in the study of theoretical mechanics - the principle of career orientation.

Initially, this principle was formulated as a principle of connecting education with practice. He combined the principle of professional direction and scientific character. Currently, according to the opinions of V.A. Popkova and A.V. Korjuev, some researchers understand this term as general education, general technical and fundamental sciences with practical production training, and the essence of this principle is general education in a certain field of professional training. and the application of general technical knowledge represents the principle of professional orientation of education.

By organizing career-oriented classes in theoretical mechanics on the basis of digital technologies, we form the level of initial preparation for professional activity, instilling in students a systematic understanding of engineering activity, its labor functions and important professional tasks.

By organizing career-oriented preparation of information-technical competence, we form the initial level of preparation for professional activities, including the use of information-technical competence, taking into account systematic understanding of engineering activity, its work tasks and important professional skills.

In order for vocational education to be successfully implemented, it must include a number of requirements. It can be found in table 2.1.2.

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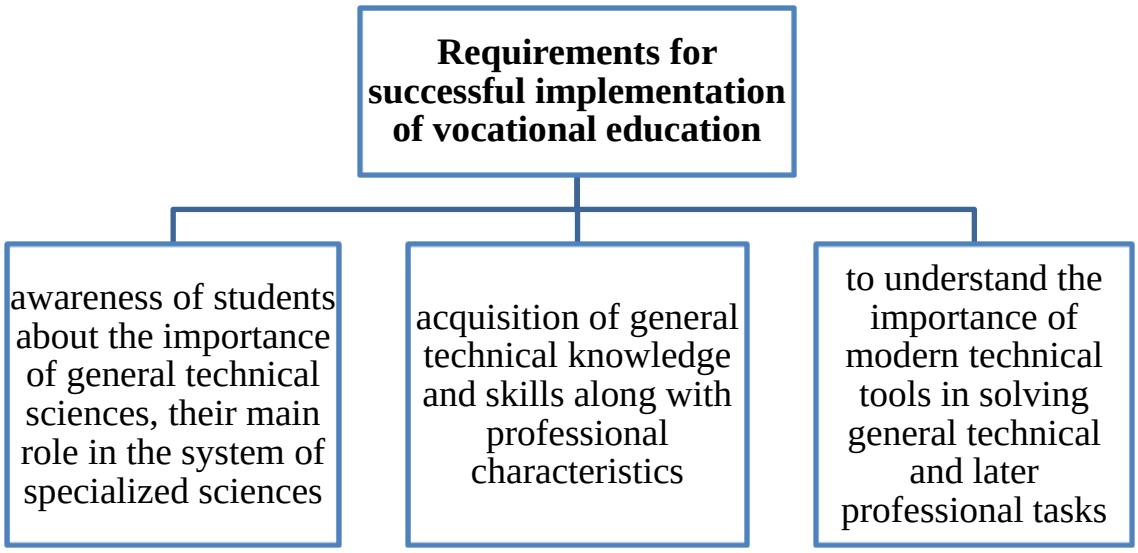

Table 2.1.2. Successful vocational training implementation requirements

Implementation of career-related training in theoretical mechanics and informatics contributes to students' understanding of the importance of knowledge and skills they possess, expanding their motivational sphere. Thus, the principle of career orientation implies the inclusion of professionally important knowledge and skills in the content of the subject in the early years and the methods of activity that university graduates should implement in the future.

In the study, career-oriented practical tasks were implemented through the use of practical applications as a means of encouraging students to acquire career-relevant general technical and digital knowledge. Accordingly, it is important to form students' technical modeling and calculation of production system elements, including calculation skills through modern practical programs. This skill allows the student to compare abstract learning models with objects of professional activity and contributes to the development of ATK-2, ATK-3.

When solving the problems of theoretical mechanics, we deal not with a real object, but with its model. Usually, when solving problems, the student is presented with a ready-made, abstract model, as a result of which he cannot well demonstrate the relationship of the real technical object with the computational model. We help students understand and develop the practical

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and professional direction of theoretical mechanics by forming the ability to independently model the design scheme of real elements of a technical system. When creating a real objective model of professional activity, it is necessary to take into account a number of different factors (production environment, movement of mechanisms, forces affecting movement, etc.), to use the knowledge of the student's memory not only in the studied subject, but also in other subjects.

Solving career-oriented tasks requires the student to activate previously acquired general technical and digital information knowledge.

K.T. Aldiyarov notes in his studies the need for comprehensive teaching of informatics and theoretical mechanics through the development of content, methods and training manuals, including not only computer science courses, but also the need to traditionally study theoretical mechanics.

Mechanics problems allow a better understanding of the meaning of differential calculus. Theoretical mechanics is one of the engineering disciplines that allows to fully reveal the practical aspect of the theory of differential equations as the main tool for the analysis of dynamic systems [4].

The knowledge acquired during the study of computer science is of great importance in the formation of information technology in the conditions of teaching theoretical mechanics. Comprehensive training of future applied mathematics bachelors in computer science and theoretical mechanics according to methods, tools and content will help to establish interdisciplinary relations and develop information-technical competence. When solving general technical problems using practical programs, students will strengthen their knowledge in the field of informatics and understand the features of these programs.

Theoretical mechanics is based on the subject areas of mathematics, physics, and computer science, and serves as a foundation for general engineering disciplines such as resistance of materials, machine detailing, and theory of machines and mechanisms.

In order for students to have information and technical competence, they must first thoroughly study informatics and theoretical mechanics. According to interdisciplinarity, in order to study

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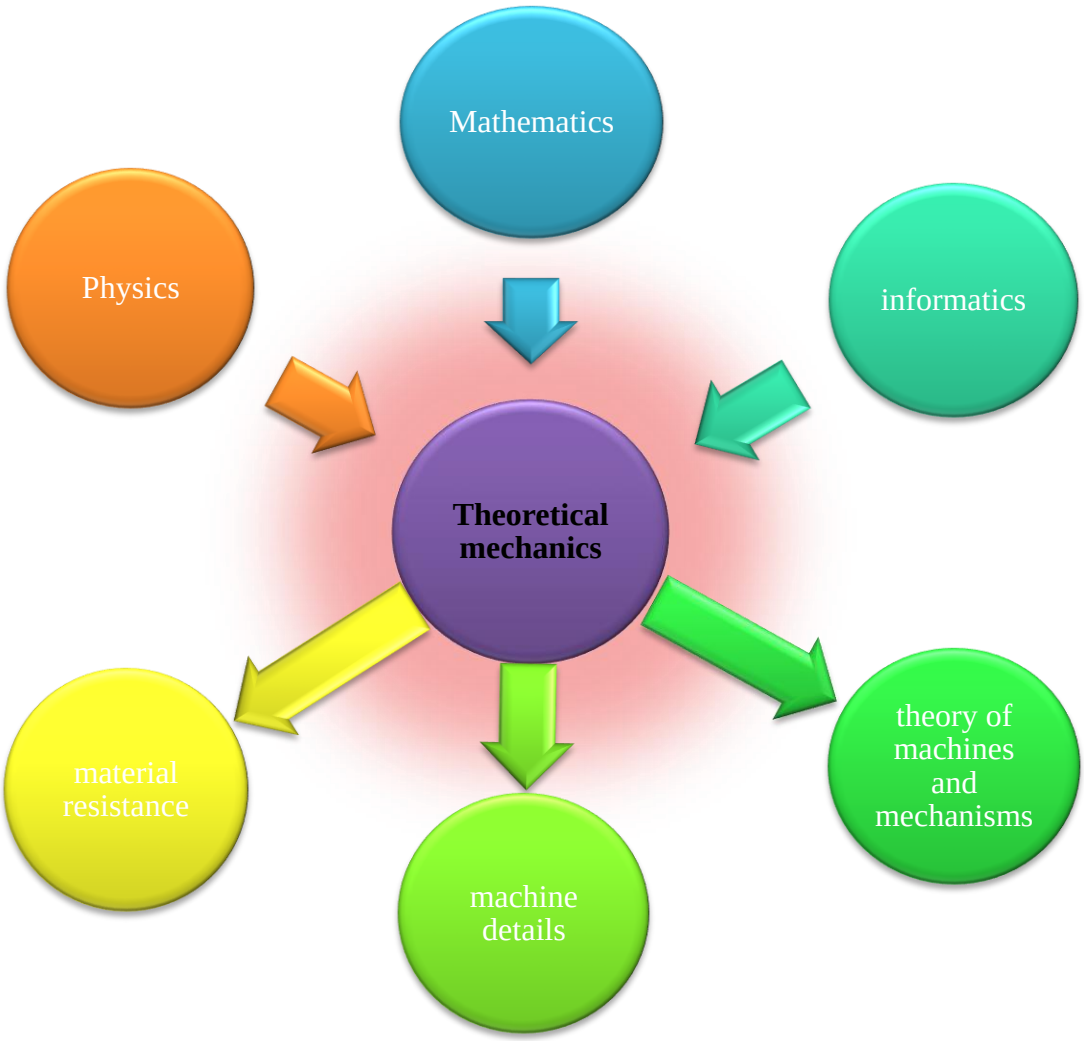
science, a student must first have excellent knowledge of mathematics and physics. After that, it will be appropriate to study the science of theoretical mechanics. Based on the study of theoretical mechanics, the student understands the laws of the processes that take place in the parts of mechanisms and devices in total movement in nature. Today, all technical mechanisms are developing depending on digital technologies. Therefore, studying theoretical mechanics with the help of informatics, i.e. digital technologies, is the basis for preparing a suitable staff for today's labor market.



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Creating a master plan that reveals interdisciplinary connections allows students to visualize the relationships between thematic modules in science as well as thematic sections of theoretical mechanics. The presentation of such a plan gives the student the opportunity to see and understand the importance of studying a certain topic at the initial stage of learning theoretical mechanics, and forms a holistic image of the topic being studied in the minds of students. Understands the need for complex knowledge to solve professional problems and skills.

Teaching theoretical mechanics includes two main components. The first component is the basic fundamental education in theoretical mechanics, which consists in forming the scientific outlook of the graduate, the skills of systematic and analytical thinking, the ability to put forward hypotheses and justify the obtained result. The second component is the development of practical skills, the ability to independently solve practical engineering problems, the creative potential of the future specialist, and the development of a personal, value-based attitude to general technical knowledge.

The role of the main relevance of the content of the subject is to form a set of basic knowledge in the graduate, which will form the basis of his professional activity in the future and will allow him to move freely in changing professional situations.

M.V. Bulanova-Toporkova said that the task of modern educational technologies is to strengthen fundamental training and give the student the ability to distinguish the main similar part of its content in a certain subject. After gaining independent thinking and new knowledge, he will be able to use the learned knowledge in new situations [3].

Purposeful use of information technologies during the teaching of theoretical mechanics corresponds to the following principle of formation of information and technical competence - purposeful use of digital technologies. The main meaning of this principle is the transition from the use of educational information tools to the systematic, purposeful use of ICT in the teaching of theoretical mechanical science, which contributes to the development of the entire information-technical competence complex [4].

CONCLUSION

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The formation of information and technical competences is considered as an integral system of interrelated elements based on the presented didactic principles and a systematic approach, and we have developed a model of formation of information and technical competence in the process of teaching theoretical mechanics. In the process of teaching the science of theoretical mechanics, we studied the components of the information-technical competence formation model, divided into targeted, meaningful-technological, and effective diagnostics.

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