

DCCD 2020**Dialogue of Cultures - Culture of Dialogue: from Conflicting to Understanding****FUNCTIONAL MODEL OF PEDAGOGICAL SUPPORT FOR
PROFESSIONAL SELF-DETERMINATION FOR TECHNICAL
UNIVERSITIES STUDENTS**

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Abstract

This article explores the problem of the development of professional self-determination of students of technical universities and ways to solve it. New technical directions of training appear. The relevance of the study of the development of professional self-determination of students is explained by the expansion of the range of scientific and educational areas of technical training and the increase in the capabilities of the university educational space. The structure of modern higher technical education is implemented by successive educational and professional programs of three levels, varying in content and duration of study: bachelor's, master's, and post-graduate programs. The different learning objectives at each level of higher education dictate different approaches to the organization of pedagogical support for professional self-determination of students in a variety of educational and professional ways of a technical university. The pedagogical support for students as an organized scientific and methodological process aimed at continuing professional education and supporting students in the development of professional self-determination becomes necessary. The theoretical basis for the development of a model of pedagogical support of professional self-determination is the systemic, competency-based, diversification and personal-activity approaches. The functional model of pedagogical support of professional self-determination proposed in the article includes the scientific-target, substantive, diagnostic and corrective, evaluative-effective blocks and organizational and pedagogical conditions. Its implementation helps to increase the efficiency of the process of supporting professional self-determination.

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Keywords: Self-determination, multilevel system, functional model, support.



1. Introduction

Higher technical education promotes innovative and economic development by creating a balance between labor market demand and training (Taylor et al., 2000). Russian technical universities, in accordance with the Decree of the Government of the Russian Federation dated May 23, 2015 No. 497 (as amended on May 25, 2016) “On the Federal Targeted Program for the Development of Education for 2016–2020”, after switching to a multi-level educational system, expand the range of scientific and educational areas (“Law of the Russian Federation on education...”, 2012). They become multidisciplinary and focus on key sectors of regional economies, implementing master's and postgraduate programs, conducting active research and innovation (Zolotarev & Shmat'ko, 2016). At the same time, the possibilities of the university educational space to ensure the personal involvement of students in the learning process with the aim of developing and realizing their abilities have increased (Yu & Levesque-Bristol, 2020). For example, only the Mytishchi branch of Bauman Moscow State Technical University. conducts training in 29 bachelor's and 87 master's programs, such as forestry, management, instrumentation, vocational training, landscape architecture, law, etc.

2. Problem Statement

The different learning objectives at each level of higher technical education dictate different approaches to the organization of pedagogical support (Ivanova, 2017). At the bachelor level, students receive basic technical education in the chosen field of study. The master's program allows you to acquire research skills and a narrower specialization, taking into account the current need of the labor market. At the postgraduate level, professional interests are focused on the study of topical issues in the selected field of modern science. The pedagogical support for students in a technical university becomes necessary because it is an organized scientific and methodological process aimed at continuing professional education and supporting students in the development of professional self-determination: choosing the direction of future activities, specialization, research interests, as well as self-realization of personal potential in the profession and development of intrinsic motivation for further career development (Chan, 2019).

3. Research Questions

In the conditions of a multi-level technical education in a university, the problem of developing professional self-determination of students is particularly urgent, which requires scientifically-based and methodically organized pedagogical support for this process (Kirillova, 2018). So, our study of motivation for choosing the direction of study for first-year students in the Mytishchi branch of Bauman Moscow State Technical University showed that for those entering the university, external motivation for choosing a profession prevails. 70% of 244 respondents were influenced by the convenient location of the educational institution, the presence of a military department, their parents' advice, and not the expressed interest in future professional activities, that indicates the low level of professional self-determination and the inability of modern students to realize new real educational opportunities in self-development by choosing educational learning pathways (Figure 1).

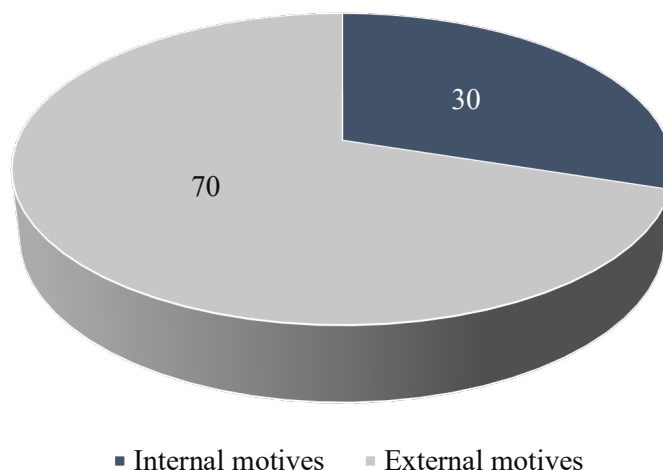


Figure 01. Correlation of motives for professional choice of undergraduate students (%)

4. Purpose of the Study

The current state of the problem of pedagogical support for professional self-determination in multilevel education indicates the need for a detailed study of this process and the development of a functional model of pedagogical support for professional self-determination of students of technical universities (Clegg & Bradley, 2013).

5. Research Methods

The theoretical basis for the development of a model of pedagogical support for professional self-determination of students of technical universities is the systemic (S. I. Arkhangelsky, P. Ya. Halperin, F. F. Korolev, N. V. Kuzmina, R. Kh. Shakurov, etc.), competency-based (V. I. Baidenko, A. A. Verbitsky, E.F. Zeer, I. A. Zimnyaya, V. A. Slastenin, Yu. G. Tatur, A. V. Khutorskoi, etc.), diversified (T. Yu. Lomakina, A. M. Novikov, E. V. Tkachenko) and personal-activity (A. N. Leontyev, V. D. Shadrikov, V. V. Serikov, etc.) approaches.

The systematic approach was used to determine the systematically important elements of the pedagogical support for professional self-determination and to establish links between them.

The competency-based approach allowed to single out the goal, tasks and functions of pedagogical support, to determine the content, organization and its evaluation in the process of training; justify the conditions for the development of professional self-determination and its support.

The diversification approach was used in the design of substantive and procedural components of pedagogical support: justification of new activities in the system of higher technical education; introducing a new form of organization of professional self-determination; justification of the introduction of pedagogical support in the process of training.

The personal-activity approach was used to highlight the individual factors of students' professional self-determination; determining the conditions for constructing an educational trajectory in the system of higher technical education; designing additional elements of pedagogical support.

According to a systematic approach in pedagogy, the training of future specialists of a technical university is a complex organization of closely interconnected subjective and procedural components, united in a hierarchical structure. The purpose of this system is to develop a competent specialist in a field that requires technical knowledge. Its subjects are the employer, teacher and student. The employer determines the professionally important qualities and skills of a sought-after specialist. The teacher develops educational programs that include the content, means and methods necessary to create an organized, focused and deliberate pedagogical influence on the formation of a person with given qualities. The student, mastering theoretical knowledge and practical skills, forms an objective vision of professional reality and a subjective understanding of the implementation of the knowledge gained in determining his place in the profession.

The procedural component of the general system of higher multi-level technical education is a form of training organization, built on the elementwise assimilation of social-humanitarian, natural-mathematical and technical knowledge, and ways of forming a subjective professional position through the development of students' professional self-determination. Therefore, the pedagogical support for professional self-determination can be considered as a subsystem of the general system of higher technical education, which solves the problems of forming the student's emotional-motivational attitude towards learning and professional activities.

All its constituent elements: goal, objectives, substantive and effective components, have interconnected relationships and interaction laws, which allows us to predict the development of the self-determination process by the level of cognitive and practical actions, as well as distinguish cognitive, reflective and effective components.

The pedagogical support for students' professional self-determination takes place in a multi-level system of higher technical education and is reflected in the formation of the student's educational needs through their awareness of the ultimate goal of teaching at each level - bachelor's, master's, and graduate programs. At the same time, the level of professional self-determination of the applicant is its initial indicator, and the result is a conscious choice of the direction of training or professional activity.

The main mechanisms for studying the pedagogical support for professional self-determination are the principles of modeling and design, based on the principles of democratization. They are implemented when the subjects of the pedagogical process are granted certain freedoms for self-development, self-regulation, self-determination, self-education and self-training.

The principle of modeling involves the creation of a model of pedagogical support for professional self-determination in higher multilevel technical education, which allows one to distinguish this process from the general vocational training system, predict its tasks and features for different levels of professional self-determination recursion, analyze the interaction of elements and build its optimal image based on self-development, self-regulation and self-education of students.

The principle of designing allows us to determine the spectrum of the activities of pedagogical support that contribute to the formation of a professional culture of students, the development of professionally important qualities, abilities and skills.

Since the competency-based approach determines the goal, objectives and allows you to evaluate the result of the pedagogical support for professional self-determination, its basic principles (consistency,

pragmatization, the connection of theory and practice, professional expediency) should be considered as the most optimal conditions for the content of this process.

The interdependence of the content and procedural components of the pedagogical support for professional self-determination provides support for the development of the student's focus on the final results of training, the holistic development of professional and personal qualities and is based on the principles of fundamentalization and levelness.

The principles of the personal-activity approach: awareness, functionality, accounting for adaptation processes, mobility, professional orientation in the pedagogical support for professional self-determination, affect the improvement of professional training of engineers and allow to design its additional elements.

The listed scientific approaches and principles formed the methodological basis of the functional model of pedagogical support for professional self-determination for students of technical universities that we developed.

An analysis of the psychological and pedagogical scientific literature and the support functions of professional self-determination of students of technical universities allowed us to further define the model of this process as a scheme, the blocks of which correspond to the main components of the recursion of professional self-determination in the framework of the pedagogical process of higher technical education.

6. Findings

The functional model of pedagogical support for professional self-determination of students of technical universities includes the following blocks: scientifically-focused (approaches, goal, functions and tasks), content-based (cognitive, reflective and efficient), diagnostic and corrective (diagnosing and evaluative components), evaluative-efficient block of organizational and pedagogical conditions (Figure 2).

All its constituent elements: goal, objectives, substantive and effective components, have interconnected relationships and interaction laws, which allows us to predict the development of the self-determination process by the level of cognitive and practical actions, as well as distinguish cognitive, reflective and efficient components.

The pedagogical support for students' professional self-determination takes place in a multi-level system of higher technical education and is reflected in the formation of the student's educational needs through their awareness of the ultimate goal of teaching at each level - bachelor's, master's, and graduate programs (Grevtseva & Tsiulina, 2016). At the same time, the level of professional self-determination of the applicant is its initial indicator (Kryzhanovskaya & Bakhtigulova, 2017) and the result is a conscious choice of the direction of training or professional activity (Petrov & Kryzhanovskaya, 2016).

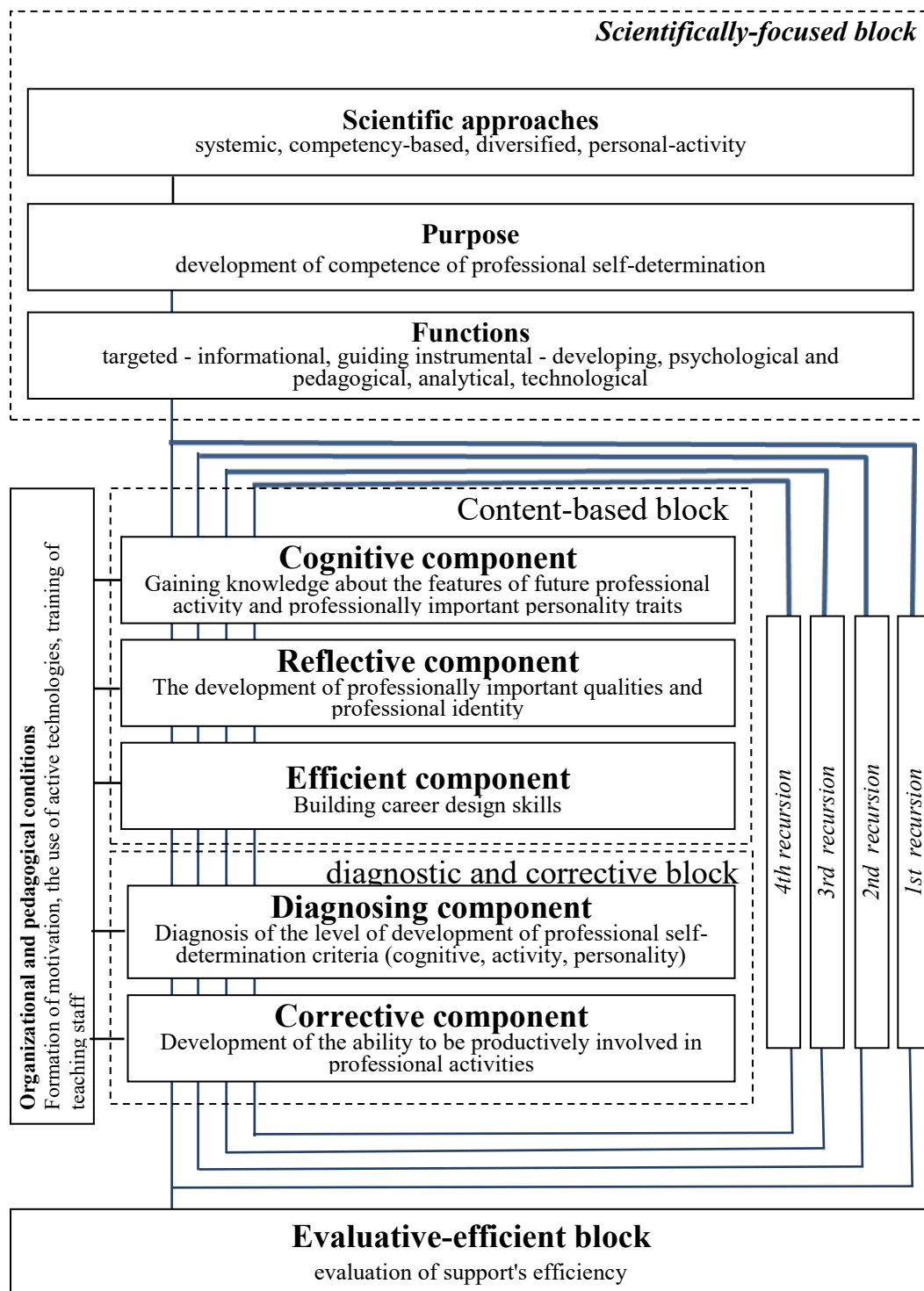


Figure 02. The functional model of pedagogical support for professional self-determination of students of technical universities

The scientifically-focused block contains three components: scientific approaches; purpose and functions of pedagogical support for professional self-determination of students.

Since the purpose is the basis of the model and determines the content of all pedagogical components (Gillet et al., 2018), the first and most significant element of the model for supporting professional self-determination for students of technical universities is the target component. The purpose of pedagogical

support for professional self-determination for students of technical universities is to develop the competence of professional self-determination of subjects of pedagogical support (applicants, students, masters, graduate students) (Beebe & Masterson, 1986).

The process of pedagogical support for professional self-determination is implemented through focused (informational, guiding) and instrumental (developing, psychological and pedagogical support, analytical, technological) functions.

The purpose and functions are implemented in content-based, diagnostic and corrective and evaluative-efficient blocks.

The content-based block includes cognitive, reflective and efficient components.

The cognitive component involves the focused formation of a knowledge system about the chosen professional field, the dynamics of engineering professions, professionally important qualities, features of professional activity, technical specialties and positions, and scientific and technical literature. It is aimed at the formation of theoretical knowledge about the world of engineering professions as a whole: awareness of the subdivision of the world of technical professions in the subject and goals of labor, tools; knowledge of general labor and general production concepts (work culture, labor discipline, principles of production planning, structure and organization of an enterprise, principles of payment); knowledge of the features of the chosen professional activity and individual related professions, the features of the chosen profession, ways to improve professionalism and professionally important qualities (Sokolova & Kolchina, 2018).

The reflective component is related to the expansion of professional consciousness and self-realization in professional activity, the development of professionally important qualities, the analysis of a personal resource. It contributes to the awareness and development of professionally important qualities of an engineer's personality, corresponding to the type of professional activity, and includes the formation of a professional orientation, the development of character traits, cognitive interests and motivation for choosing a profession (Von Glinow et al., 1983).

The efficient component involves the formation of the following career design skills: making choices, setting goals and drawing up a program of actions to achieve it, productive inclusion in professional activities, working with sources of career-relevant information, analyzing options for continuing education, differentiating external and internal factors for choosing professional activities, use of personal resources and existing experience.

Evaluative-efficient block includes the diagnostic and correction components and allows you to analyze the results of the pedagogical support for professional self-determination in a multilevel technical education.

The task of the diagnostic component is to monitor the results of the level of development of professional self-determination of subjects of pedagogical support at different stages of higher technical education, to determine the efficiency of the methods of pedagogical support for professional self-determination.

The correction component in pedagogical support is aimed at ensuring: conscious professional self-determination, determining and improving the forms and methods of developing students' abilities to be productively involved in professional activities, prevention of crises of professional choice. The main

objective of the component is the formation of career design skills and the ability to analyze the available options for professional growth, including continuing education (Edwards & Nicoll, 2006).

Evaluative-efficient block allows you to determine the effectiveness of the pedagogical support for professional self-determination. In the course of a theoretical study of professional self-determination based on the analysis of the works of A. R. Arslanova, N. A. Bulkina, N. A. Kobzeva, S. Yu. Manukhina, S. L. Melnikova, N. F. Rodicheva, V. V. Filonova, S. N. Chistyakova etc. Identified criteria (cognitive, activity, personality) and their indicators, according to which the levels (low, medium, high) of professional self-determination of subjects of pedagogical support were characterized.

The block of organizational and pedagogical conditions for pedagogical support for professional self-determination for students of technical universities contains the organizational and pedagogical conditions for the implementation of the model developed by us in the process of research:

- 1) the formation of applicants and students' motivation to develop professional self-determination;
- 2) the use of active and interactive educational technologies in pedagogical support that stimulates the process of professional self-determination of students of technical universities and contributes to the development of professionally important qualities as an engineer;
- 3) training the teaching staff to support professional self-determination for students of technical universities, including the mastery by teachers of methods for organizing career guidance of students in the course of vocational training, studying the dynamics of professions that require engineering knowledge and their relevance in the modern labor market, familiarizing themselves with the features of students' professional self-determination.

7. Conclusion

Our proposed functional model of pedagogical support for professional self-determination for students of technical universities that we offer is characterized by pragmatism, integrity and dynamism, and its implementation, taking into account the latest achievements of pedagogical science and university practice, helps to increase the efficiency of the process of supporting professional self-determination, which was shown during a pedagogical experiment.

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