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METHODOLOGICAL SUPPORT FOR THE FORMATION OF THE TECHNICAL UNIVERSITY STUDENTS' PROFESSIONAL MOBILITY

SUMMARY. The fast changes in the modern society require specialists who are able to analyze constantly the changing socio-economical conditions, to find and realize innovative ways in the market competition, to overcome stereotypes in the solution of problems concerning not only professional, but also a private life. Training of specialists capable of reactions to all the changes taking place in the society and the professional sphere is the major problem of modern vocational education. Scientific and methodological maintenance of the formation of students' professional mobility is reflected in the sphere of work associated with the formation of students' creativity and liability, awareness and acceptance a person in the profession; students should be able to adapt to professional activities and know how to organize, develop and improve their skills and build their career; in addition, they should master the techniques of self-development using a design process. The integration of students' knowledge is the key for a quick adaptation to the conditions of the future professional activity and the possibility of self-realization as specialists.

KEY WORDS. Professional mobility, creativity and liability, systems thinking, design activity, life situations, reflective activity, self-development, building a career.

The objective set within the Conception of a long-term development of the Russian Federation for the period till 2020 is the development of *professional mobility* based on professional advancement, constant education and re-training. This will allow employees to increase their competitiveness on the labor market and realize their working potential in more dynamically developing economic sectors in accordance with the demand [1; 57]. It primarily concerns people with technical background, as the technological expansion triggers the expansion of the professional field of the technical schools graduates. Therefore, technical graduates, following the technical regulations of the modern production and social situation development, are to perform scientific research, as well as design-engineering, engineering-manufacturing, organizational-managing and other functions. These factors make the formation of future engineers' professional mobility necessary as far as it allows them to respond quickly to any changes in the society.

There are several scientific approaches to the complex phenomenon of professional mobility. Such a situation facilitates its understanding and allows to draw some

conclusions on the possible ways of its formation. By professional mobility we understand the integral identity formation, based on the ideal combination of its basic elements: social and personal values, professional creativity, projective thinking, - as well as the readiness and ability to adapt to changes and innovations in the professional field.

Considering professional mobility as a generic essential feature of a human, we acknowledge the unity of its personal and social elements. Underlining its dynamic nature at different levels, we point out its dynamics and changeability, and the potential of its realization. In this connection, the development of a scientific methodological support for students' professional mobility formation becomes necessary. This aspect is reflected in the research of this phenomenon's components formation considered as a whole (including value, theoretical and practical components).

The first approach is linked to the formation of students' creativity and lability. They mostly reflect theoretical and practical components of professional mobility.

Psychologists identify two types of thinking: reproductive (convergent) and creative (divergent). People with the prevailing convergent way of thinking belong to an intellectual type and are able to solve even difficult tasks. Though these tasks are assigned by someone and already have a certain solution. While a divergent-creative type people are able to see and assign tasks, go beyond the familiar scope. In fact, any person possesses both intellectual and creative abilities, though differently pronounced. Throughout the entire life creative thinking is gradually subsiding.

Most students are conformists, afraid to show independence, unwilling to search for original solutions, preferring clear-cut information. So, unpredictable situations and creative tasks easily puzzle them (A.A. Ghin [2]). However, creative and open-minded thinking development is hindered by the assigned, "closed" tasks with obvious solutions. Thus, a student faces a question: What I should do if the apparent solution of the problem is impossible?

Such mental operations as analysis, synthesis, comparison, generalization, classification, particularization and abstraction allow students to tackle the problem and find a way to resolve it. These mental operations are mastered throughout everyday educational process while dealing with practical and educational tasks within a certain subject area (in terms of the cultural and professional preparation).

The above mentioned mental operations underlie such inventive methods as "trial and error" method (the way to work out new behavioral forms in a problematic situation), "test question" method (using leading questions in order to help find a task solution), "synectics" method ("attacking" the arising problem by special professional groups using different analogies and associations), "focal objects" method (searching for new solutions of the problem with the help of the associative field and heuristic features of probability), etc [3].

In fact, the entire educational process in a technical university is meant to form the *systematic thinking* based on multiple operations, forms and ways of thinking. The systematic thinking can be developed through engaging students in the *project activity* that involves knowledge updating on a number of subjects that might seem

totally disintegrated at first sight. For example, Albert Einstein used to say that it was F.M. Dostoevsky's characters, the analysis of their feelings in particular, that helped him make many of his discoveries in physics. The well-known physicist used the ways of life problems solutions offered by Dostoevsky for solving physical tasks. What's more, these solutions were later embodied in the theory of relativity.

The curriculum of most technical universities lacks subjects of creative nature. This is due to the educational policy of the institutions, the eternal opposition "lyricists vs. physicists". These and many other reasons do not allow to form a separate discipline dealing with the practical implementation of the received theoretical knowledge, the development of creative and systematic thinking, and imagination; teaching analysis and synthesis, innovation management, task-management methods.

Educational process in the university is connected with the solution of the real learning and practical tasks, implementation of the real projects. Bauman's Moscow State Technical University's practice is one of the brightest examples of engaging students in the project implementation. Every third year student here has to undergo a training course at an enterprise, where he/she makes a research\project on the enterprise's subject area. The educational process, therefore, includes a modern approach to task-management with the lack of the initial information. This method, widely used by modern companies to find innovative solutions, is called *Stanford design-thinking method*. It presupposes the division of the whole task-management process into certain short stages. A group of students have to go through all the stages together and meet the deadlines, often by brainstorming, generating 2-3 dozens of ideas within a few minutes (V. Podolsky) [4]. The efficiency of such methods is much higher than poorly organized teamwork. It is interesting for a student with the developed systematic thinking, accustomed to interdisciplinary thinking, to be challenged by professional tasks, based on solving production-oriented and also social problems. Such students become a driving force of innovation processes both at work and in life.

The second approach is connected to the formation of students' self-awareness and self-acceptance in a profession. It means the correlation of the professional requirements with one's capabilities, understanding oneself as a subject of the future professional activity. It reflects the essence of the value and theoretical components of professional mobility.

The development of professional self-identification of technical university students involves awareness of the possibilities, boundaries and main points of their profession. The humanity is facing a crisis that is the result of human activity, so it is an anthropogenic and social crisis, associated with the question: "To be or not to be". It requires to boost self-identification of the whole society and each individual.

With this regard, we applied to the methods of actualization of students' life experience as a valuable teaching material necessary for learners' *reflexive* activities.

At the psychological-pedagogical lessons the students were engaged into an acme-focused discussion of the issue of achieving a high level of professional development (A.A. Derkach, N.V. Kuzming, E.F. Zeer et al.). The texts discussed in the classroom allowed to improve understanding and encouraged the would-be professionals to

define goals for their professional development. For this purpose a number of tasks, meant to construct an axiological series of concepts, a problem and the ways to solve it, were used. This process included the following aspects: 1) Acmeologically focused tasks were to identify the problem of human development after having achieved the peak of development (achievement motivation in the professional activity, self-development and self-realization motivation, motivation of autonomy and independence in the process of individual development, creative motivation). They were also meant to find solutions for this problem for the people who have already achieved public recognition. The engagement into the acme-focused development process stimulates specific acme-abilities: vitality, lability of dealing with life issues, ability to switch from one problem to another, ability to design and implement an individual strategy of one's development, to rely on the "ascending comparisons" (E.F. Zeer) [5], i.e. to make tasks of the forthcoming stage of development more difficult than the ones of the present stage. To that end, psychological portraits of the high-achievers in some professions were analysed (G. Hervieu, V.I. Muravlenko etc.). 2) Axiological problems were used to tackle specific professional issues. *Interviews* with the people who have reached the peaks of their professional career were conducted. Interviewing people and analyzing their memories, the students applied the learnt concepts about the human nature, fundamental laws of personality formation and development (B.M. Bim-Bad) [6]. Besides, it helped the students understand reasons of professional failures and map out some ways to overcome them. The students prepared essays about the prominent people in their field, graduates of Tyumen State Oil and Gas University. 3) Psychological problems were aimed at understanding and explaining a certain state of mind of a person. A high level of professional development is achieved through self-regulation, preserving one's own initiatory position and forming individual style of activity in a changing professional environment. Therefore, some lessons were held in the form of professional psychological trainings and business games. 4) Personally-focused problems and their solutions were connected with the references to one's past, to the analysis of one's memories associated with the motives of career choices.

The students reflected over the professional activity analyzing memories about the career choice, their first steps in the professional field, professional successes and failures. Work with *life situations* helped the students; it was the situations urging to search for social and personal meaning of one's work. For example, the students were asked to recall certain situations significant for their professional activities and evaluate them from the present perspective. People become interested in some activity if some personal meaning is involved, connected with the work for the public good.

The third approach concerns *the adaptation to professional activities, methods of self-organization and self-development, improvement of one's professionalism, pursuing a career*. It reflects the development of theoretical and practical components of professional mobility.

A personality was viewed in a social context (G.M. Andreeva) [7] and in the system of social relations. The content of a future specialist's activity was designed

in terms of its subject-technological component (subject context), and social component (social context).

Students are engaged in *educational and professional activities* that include mastering generalized activity patterns and ways of self-development with the help of the special educational-professional tasks, scientific research and field study. It allows them to adapt to the position of a specialist.

Some characteristic features of the future profession become evident during topical lectures, seminars, discussions, group activities, laboratory and practical classes, analyses of the certain production situations, etc. Students have an opportunity to use the instructional information for managing their own activity. It encourages a future specialist to enter the profession without any difficulties connected with workplace adaptation. While *communicating and interacting with one another*, students form both subject and *social competence*. Personal meanings transform into social values, characterized by a student's attitude to the society, labor and oneself. As a result the profession gets being seen as a part of the culture. Significance of every student's peculiarities and interests, as well as observation of the professional and educational regulations boost social and personal effect. It is reflected in the specially organized *trainings* for mobility development, comprised of games with changing activities, conditions and roles; and exercises encouraging a perspective professional self-identity and reflection over one's state and behavior.

During the whole educational process, while implementing the above mentioned approach, educational activity was transformed into professional one. The students mastered professional activities. They became subjects of the future professional and social-cultural activity. Such an approach underlies "case study" method (case-technology, learning by certain examples) which is used within the contextual education, when theory is taught *on true-to-life examples*. Students therefore acquire all the necessary skills: analytical (analysis, classification), practical (implementing the theory in real life), creative (searching for solutions), communicative (the ability to work in a team, hold discussions and persuade the opponents), social (organizing and uniting people), reflexive (self-introspection).

Dynamically changing competitive conditions require a specialist to be broad-minded and well-read, to possess analytical skills, management skills, to understand *social problems*, to be able to deal with the definite situations. For this purpose, we used *the methods of dialogue involvement* (N.T. Savrukov, N.S. Stepanov, V.A. Alekseev) [8], namely: the method of a conference, group and game method, the incident method, the method situational specification, scores comparison, playing a scenario, ranging the elements, brainstorming, "firing" questions at a teacher. For example, a panel discussion was important when dealing with the complex arguable questions. As a rule, the teacher invited a specialist to the classroom as a guest.

At the seminars, the method of *business game* (also used in the innovative management) was widely used. The didactically processed "Grönholm's method" (a play "El mètode Grönholm" by Catalan playwright Jordi Galceran) helped to find out the most suitable candidate for the position. The formation of the important

professional qualities was important: tolerance to competitors, readiness to cooperate with colleagues, negotiation skills, conflict-management skills, ability to find optimal solutions, to critically assess the acquired experience, to stand one's ground, to adapt to new conditions. The procedure of "professional selection" was turned into a psychological test, training, meant to peep into one's mind. The following tasks were used: to try to convince everyone that you are the best candidate for the job; to decide what to do if in the rush period one of your employees falls ill, and all the other staff are busy with their own duties; to finish up the sentence "To make employees work well, you should ...", etc. In such a game the applicants must "outrun" each other. One shouldn't lose his\her human nature for the sake of the career. The game makes it possible to dispel the myth that the ideology of modern capitalism requires managers of the large corporations to play hard in order to make profit.

The *vitaginic education technology* connected classroom with the real life as a guarantee for conscientious and stable knowledge (A.S. Belkin, N.O. Verbitskaya) [9], [10]. The technology is based on implementing life experience for educational purposes. Vitaginic experience is transformed life experience, making it possible for students and teachers to realize their personal approach. While tackling the problem of professional mobility formation the following techniques became efficient. *The retrospective analysis of life experience* was used in the situations where students' analytical skills and the ability to draw conclusions, while comparing life experience and the educational situation, are necessary. In this case, a teacher should show to the students the value of their life experience. *The method of initial actualization of students' life experience* is meant to reveal their background knowledge before giving new material. It allowed to assess their intellectual potential and to prepare them for perceiving new information. *The method of designing the future* helped to realize their creative potential and their need for self-actualization. The students were offered an idea, an unfinished work that they were to complete using their life experience.

Therefore, this approach is implemented in a number of subsequent stages: from practical mastering of the self-enquiry methods, defining the scientific problem and the ways to solve it, to testing the received instructions in conditions of independent professional activity.

The fourth approach is connected with mastering professional self-development technologies through project work [11], [12], [13]. It reflected the development of axiological, theoretical and practical components of professional mobility.

Joint planning and practical organization of the educational process in high school presuppose educational standards discussion, curricula and field study programs assessment and evaluation. When using business and simulation games, collective planning was being taught. The subjects specified in the educational standard as well as the university's educational facilities were employed within the framework of this approach.

The objectives were the following: professional mobility implementation in the educational environment through joint planning of the learning process and its practical

organization in the university (focus groups on “Developing competence profiles of young professionals-graduates”); study and review of the foreign experience of staff training and putting it into own practice; meeting the representatives of Russian and foreign companies; attending specialists’ workshops; organizing open days and job fairs, trainings, field studies; educational tourism, organizing school children marathon, etc.

It was important to encourage future professionals to develop *reflection* as a criterion of the complete formation of the professional mobility theoretical component. This component is revealed through understanding of the value of humanitarian, social and economic, mathematics, natural science knowledge required in professional activity. The studies showed that the integration of the knowledge helped the graduates quickly adapt to unfamiliar conditions at work, find understanding with the team, realize their creative ideas [14], [15].

Students’ professional mobility formation based on cultural and personal development promotes successful learning and skills acquisition, and also contributes to the formation of the worldview and competence. It also highlights social and personal significance of education; provides students with more profound and stable knowledge acquisition and possibility to move on in their subject field; increases their motivation and educational interest.

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