

1.3 Modern methods of forming readiness for professional and personal development of technical universities students

In the conditions of modern modernization of education, self-development of a students' personality acts as a necessary condition for their competence, the formation of which is significantly influenced by the educational process of a higher educational institution. Recently, along with professional knowledge and skills, essential importance is given to the personal qualities of future specialists and the requirements of their chosen profession, to the acquisition of independent work experience during the training process. The Law of Ukraine "On Higher Education" declares the need for professional training of future specialists in accordance with the modern requirements of the labor market, employers, and consumers. In paragraph 3 of this Law, it is stated that the governmental policy in the education system should be aimed both at training competitive specialists for priority areas of economic activity and at creating conditions for self-development of the individual throughout the life. In connection with this, there is a need to form students' readiness for professional and personal self-development in the learning process.

This is especially relevant for engineering students, who are trained in technical universities, as the field of their professional activity is in the process of constant transformation and continuous development. Analysis of the State educational standards of engineering specialties, which determine the content of professional training of students, shows that they do not sufficiently take into account the specifics of the students' professional and personal self-development during their studies in higher education institutions. The training of engineers mainly uses the information model of education, which is aimed at acquiring the necessary professional knowledge and skills and, in the best case, forms students' ability for spontaneous professional and personal self-development. At the same time, self-development in them does not appear as an internal-personal task, but occurs under the influence of external requirements. In this case, the priority of professional knowledge cannot be doubted, but at the current stage of society's development, this is not enough.

Thus, the development of new pedagogical technologies and approaches to the organization of education aimed at forming readiness for professional and personal self-development among future engineers becomes relevant. Pedagogically and psychologically motivated personality development usually leads to self-development and self-education of all its substructures. This is the most important indicator that determines the speed and quality of acquiring various types of experience not only in the process of professional training, but also continuously throughout life.

Theoretical provisions on the content of professional and personal self-development of the future specialist and applied aspects of this process are considered in the works of M.V. Kanivets, L.N. Kulikova, V.O. Lozovoy, Johnson R.N., Kumar A [59-63] and others. A.V.Petrovsky defines self-development as a socio-cultural process of conscious, rational self-education (self-learning, self-education, self-determination) and a spontaneous, nature-determined process of versatile self-realization of an individual. Self-development includes any activity of the subject, which is carried out consciously or subconsciously, directly or indirectly, and which leads to progressive changes in mental, physical functions, and social abilities [64]. N.G. Yershova understands the concept of "professional and personal self-development" as a continuous process of self-design, which ensures further creative self-realization in the process of activity, increasing the level of self-awareness of an individual, which acts as a combination of a person's personal and professional orientation in the learning process [65].

Self-development is a multifaceted phenomenon that reflects the process in which a person learns, transforms, develops and improves himself. The process of self-development, according to O.O. Bodalov, includes: changes in the motivational field of a person, where universal human values find their essential expression; the growth of the ability to plan at the level of intelligence and then carry out in practice exactly those actions and carry out those actions that correspond to the spirit of the mentioned values; growing ability to mobilize oneself to overcome difficulties of an objective nature; a more objective assessment of one's strengths and weaknesses and the degree of one's readiness to realize the intended goals [66].

In this way, the concept of "professional and personal self-development" of the future engineer can be interpreted as "a conscious, purposeful, diverse self-change of the individual, which serves the purpose of his maximum spiritual-ethical and effective-practical self-enrichment and self-disclosure; it is its independent formation aimed at successful self-realization in society" [67]. It has its own purpose, motives, methods and results, which are determined by the direction of self-development.

Many researchers emphasize that the student period is sensitive for intense self-awareness and self-development and has its own unique specificity. It is this age that characterizes the process of active psychological and social development. In many ways, it ensures the presence and formation of the most important personality qualities necessary for successful activity, and also assumes the need for their full detection, development and use. In order to obtain a personal sense of future activity, it is extremely important that education turns into a process of self-knowledge and self-development, conditioned by a clear awareness of oneself and one's life program, which requires the need to activate self-knowledge aimed at forming the ability to reflect, adequate self-esteem, self-confidence, personality qualities necessary for successful professional activity.

Orientation of the educational process of higher educational institutions on the professional and personal self-development of the student involves the creation of such a developing environment that would contribute to the fact that the student himself more and more consciously and purposefully mastered the methodology and technology of self-knowledge, self-education and self-improvement. The personal result of professional self-development is manifested in the dynamics of the self-image and its characteristics [68]. Its main mechanisms as a purposeful influence of a person on himself are self-knowledge, self-determination, self-control, self-regulation, self-education, independent work.

V. Maralov, in turn, defines such mechanisms of self-development as self-acceptance and self-prediction. Self-acceptance, completing the acts of self-knowledge, is the recognition by a person of all his sides and qualities that cause both positive and negative emotions, and determines the originality of predicting himself in

the future. Self-forecasting makes it possible to go beyond the limits of today's self, predict external and internal life events, set tasks for future activities and self-development [69].

In order for the process of professional and personal self-development to proceed effectively, the individual, first of all, must have a high level of readiness for its implementation. According to the definition of the acmeological dictionary, readiness, or the internal ability of an individual, is "a high level of development of motivational, cognitive and volitional processes, which ensures the success of future activities; it is an adequate setting, motivation and mobilization of psychological resources for the next activity" [70].

The study [71] describes a pedagogical experiment to identify the readiness of future engineers for professional and personal self-development, conducted on the basis of the National Technical University "Kharkiv Polytechnic Institute". Students should have realized the need and importance of professional and personal self-development in the process of acquiring fundamental and special knowledge, abilities and skills for successful implementation of future professional activities; the necessity and expediency of self-analysis and self-knowledge and other mechanisms of self-development; learn to formulate goals and objectives, plan your actions and interaction with participants in the educational process.

This process was carried out with the help of awareness of the image of one's self, the development and improvement of one's personality in accordance with the social and moral requirements of society, the conscious use of knowledge about the mechanisms and regularities of mental activity.

During the experiment, it was found that 34% of the participants of the control group (CG) and 37% of the experimental group (EG) have an adequate level of self-esteem or a coincidence of expectations regarding their own and real capabilities; 47.1% of subjects with EG and 42.4% with CG have an inadequately inflated level of self-esteem, therefore, they are characterized by an incorrect perception of themselves, an idealized image of their personality and capabilities, their value to the environment, they can ignore failures in order to maintain their usual high evaluation himself, his

actions and affairs. 15.9% of students from EG and 23.6% from CG have a low level of self-esteem, do not set difficult-to-achieve goals, tend to limit themselves to solving everyday tasks, are too critical of themselves. A small difference between the indicators of the students of the experimental and control groups indicates that the acquisition of self-knowledge skills is a rather long process and requires considerable attention to oneself.

The results of the study using the "Self-confidence" test by V.G. Romek show that a high level of self-confidence is characteristic of 35.6% of the participants of the CG and 38.8% of the students of the EG. The average level of self-confidence is typical for 38.4% of subjects in CG and 45.6% in EG. In the presence of such a level, a subjective positive assessment of the results of one's own actions and a positive opinion of significant people, which will stimulate the growth of one's confidence, are important for the individual. A low level of self-confidence is typical for 26% of CG participants and 15.6% of EG students. They do not always manage to overcome their social fears, often have to fight with their shyness and stiffness.

Increasing the level of self-confidence of students in the process of professional training is achieved as a result of the accumulation of professional knowledge, abilities and skills, broadening of horizons, self-knowledge, formed attitudes, value system and active self-realization. Effective for its formation is the teacher's purposeful creation of situations of success, when the student is satisfied with the result of his activity. It increases students' focus on successful professional activities, promotes the development of their initiative, creativity, and activity.

Self-confidence is related to reflection, which is a specific mechanism of self-knowledge. This is self-awareness and change, an attempt to go beyond the level of personal development that has been achieved.

The results of reflectivity diagnostics according to the method of A.V. are presented in [71]. Karpova [72]: 5.1% of students from CG and 7.4% of EG have a high level of reflectivity, average - 53% from CG and 61.6% from EG, low - 41.9% from CG and 31% from EG, - testify to the need for psychological and pedagogical support from teachers to raise this level.

Within the framework of the experiment, students were asked to create a self-development program with an indication of the deadlines for the planned actions, which contributed to the formation of students' focus on successful professional activity and constant self-improvement of their own personality.

One of the directions of professional training of future engineers is the organization and guidance by teachers of students' efforts in self-regulation of their personality, one of the functions of which is self-control [73]. According to the results of the study, self-control methods were not formed in approximately half of the students of the control group, in other students they were formed partially and only in 5% in full. The average and low level of development of self-control among future engineers can be explained by the fact that most often it is teachers who use methods of monitoring the activities and behavior of students.

If CG students did not feel changes in this area, EG students noted some growth in self-control skills. First, they were informed about the forms and methods of applying self-control and its necessity for obtaining positive results in educational activities. Secondly, during individual and team independent work, they confirmed the need to master self-control skills. Thirdly, participation in the experiment, especially in classes organized according to the ASN methodology, formed in them the development of the ability to self-control and mutual control. This was facilitated by the participation of students in active independent work during the experiment and during the preparation and design of reports for laboratory work, speeches and discussion of the content of thematic lectures, development and presentation of projects.

Independent work of students is one of the most important components of the educational process, which results in the acquisition of knowledge, the formation of skills, the assimilation of various methods of cognitive activity is ensured, the interest in creative activity increases and, ultimately, the ability to solve tasks.

In a study conducted on the basis of NTU "KhPI" [74], it was found that 84% of students perform independent work out of necessity, 56% on their own initiative, and 84% for the purpose of self-development and self-improvement. The analysis of the

answers regarding the factors that become an obstacle to the implementation of independent work gave the following results: 35% of students said that they do not have enough experience to successfully carry it out; 65% - have no desire; 74% noted that they do not have enough time. Also, 30% of students admitted that they do not know how to rationally organize work and allocate time effectively, 20% of students defined their level of ability to independently work with literature as low. These indicators indicate the need to increase the efficiency of independent work of students in the process of training future specialists during their studies at higher education institutions.

The student's independent work is a way of the student's active, purposeful acquisition of new knowledge and skills without the direct participation of teachers in this process, but under their guidance. It is intended not only for mastering this or that aspect of the discipline being studied, but also for forming the ability to independently pose a problem, find constructive solutions, take responsibility for their implementation, etc. Independent work contributes to the improvement of learning efficiency and provides an opportunity to form students' readiness for self-development and self-improvement. Closely related to classroom work, it is the most important and, most importantly, effective source of the effectiveness of their training.

First of all, the student must understand the purpose of independent work. Then, in accordance with it, he thinks over the sequence of actions and evaluates the conditions for its achievement. The result is a subjective model, on the basis of which the student makes a program of actions for self-development and self-improvement, determining the means and methods of its implementation. In the process of performing independent work, he must learn to control his actions. To evaluate its results, students must receive data on how successful it is.

In order to activate the process of students' cognitive activity, it is necessary to use such technologies and methods of learning, which would also allow to independently obtain and assimilate new knowledge from various sources and apply it in practice.

In order to increase the level of formation of professional competencies of graduates of educational institutions, the activation of independent work is possible in the following directions: cooperation with enterprises and organizations or creation of conditions for professional activity in classrooms with the help of innovative teaching methods that activate the thinking process and methods of independent work of students. This gives an opportunity to learn not only from the teacher, but also from each other, think critically and take responsibility for choosing a decision. To solve the tasks, the following will be useful: the organization of individual study plans with the involvement of students in research work; creation of a set of educational and teaching-methodical aids for the implementation of SRS; development of a system of integration interdepartmental tasks; orientation of lecture courses on independent work; rating method of SRS control; development of tasks that involve non-standard solutions, etc. It will be useful to analyze and use the experience of foreign colleagues [75] regarding the organization of the educational process.

The training of specialists who are professionally mobile in the modern labor market requires varied educational programs that take into account the personal needs of students. In recent years, in the system of training future specialists, considerable attention has been paid to the adjustment and coordination of work training programs, the introduction of integrated forms and methods of student training. It is advisable to organize practical classes using a system of different level tasks, while a differentiated approach allows the teacher to individualize work with students, identify existing difficulties and choose a way to correct them. The advantage of the organization of the educational process during laboratory, independent, seminar classes is the introduction of such technologies (for example, adaptive technology for teaching disciplines) that allow the use of individual independent work, work in small groups under the supervision and guidance of a teacher, or with joint work with a teacher. An opportunity is created for the development and implementation of knowledge, the development of flexibility of thinking, the ability to generalize and draw conclusions, a field for initiative and self-assertion opens up. Self-control (including using technical means) and self-evaluation, mutual control and mutual evaluation in combination with

teacher control are actively involved. At the same time, the teacher acts as a consultant, assistant, participant, referee - evaluates creative activity and its result.

Innovative learning technologies, such as modeling, creating problem situations in the learning process, the project method, business games, coaching, portfolio, and others, contribute to the activation of students' independent work. So, problematic situations pose the problem of choice of the student in the decision-making process, it shapes not only his will, but also his thinking. The purpose of the business game is to give the student the opportunity to learn to develop and make decisions in simulated conditions. The theme of the game can be related to specific professional situations or be of an applied nature, include situational modeling tasks on current problems.

An example of the organization of independent work in extracurricular time is the project method [76]. The project is a special product of the activity of its subjects - embodied in the process of practical tasks and measures, the image of the result with defined basic properties and relations, which is created from the elements of the educational situation related to the professional activity of students. It stimulates actions aimed at obtaining a unique and unrepeatable result. The collective nature of the project is assumed, where each of the participants performs distinct functions to solve various elements of the educational situation. At the same time, there is an opportunity to understand the obtained result, to highlight its resistant and unique characteristics. Project analysis allows teachers to identify new elements, add and transform educational material, change methods of activity and the context of the educational situation related to the field of professional activity. Thus, the project method includes a set of research, search, problem-solving methods, creative in essence.

It is advisable to involve students in such work from the first year. Project activities can be implemented even at departments that teach fundamental sciences in cooperation with graduating departments with the support of interdisciplinary connections. At the beginning of work, students are given a goal: what result they should achieve, what knowledge and skills they should master, which methods to choose and master. The task should be difficult enough to stimulate independent work

and turn to the teacher for advice, establish student-teacher cooperation, but not so difficult that students lose confidence in their own abilities and lose interest.

It is necessary to provide students with information about sources of knowledge: textbooks, methodical instructions; to encourage the search for additional literature. The results of the work are summarized and drawn up in a report, for which students need to learn to formulate a goal and task, express their opinions, structure the text, and draw conclusions. In the course of such work, conscious questions to the teacher-consultant are formed, the acquired knowledge is systematized, and it becomes the property of the student's personality, his knowledge-beliefs. Actively assimilated, they are more deeply assimilated and more easily activated - the educational effect, more flexible and have the property of being transferred to other situations - the effect of the development of creative thinking. At the same time, the development of intelligence is stimulated - a developmental effect, interest in the content increases, teamwork skills are learned, conditions are created for the identification of leadership qualities, for the formation of adequate self-esteem and self-confidence - a psychological effect.

Students' attention should be focused on the direct influence of independent work on the formation of such personal characteristics as mobility, the ability to predict the situation and actively influence it, and the independence of assessments. Students have seen the positive results of their work. Then their experience of success in learning will contribute to the transformation of indirect interest into direct interest, which, in turn, catalyzes an increase in student activity.

The format of the workshop in the educational system of higher education can be applied both during classroom sessions and during extracurricular time allocated in accordance with the curriculum for independent work of students. The choice of the form of holding this event depends directly on the academic subject, the predetermined goals and objectives of the meeting, as well as the resources available and prepared in advance to ensure their implementation at the proper level.

Brainstorming can be used in almost all higher education courses. Its use in organizing the work of teams engaged in joint project activities is seen as especially appropriate. The need to generate ideas helps to unleash creativity, the selection of

options for solving a problem stimulates the development of critical thinking. The leadership qualities of the participants are manifested and developed. Each student is aware of his importance, which helps to increase his self-esteem. The team is rallying. Future engineers get a positive experience of getting out of a crisis situation.

A discussion club can be organized, for example, in seminars, as well as a separate event that helps to broaden the horizons of students. During preparation, students acquire the skills of searching and selecting information, working with literature, taking notes, generalizing and isolating the main elements of scientific analysis. Logical thinking is being developed. In addition, there is a need to improve speech, correct the idea of personal image, learn to defend the opinion. Stress resistance is being formed. Participation in classes organized in a workshop format helps students to identify areas of a personal and professional nature that require improvement and development. That increases motivation and forms readiness for self-development and self-education.

During the study of courses in physics, chemistry, electrical engineering and most special technical subjects, it would be useful to use the workshop format. First of all, theoretical information is practically immediately applied in practice, which translates them into the category of one's own knowledge. The intensity and effectiveness of communication both between the teacher and students, as well as between members of the study group, is increasing. In recent years, the "portfolio" technology [77] has become widespread in progressive schools, which is becoming one of the essential elements of the modernization of education taking place all over the world, which promotes the activation of the independent work of those who study. The "portfolio" method includes a systematic and specially organized selection of arguments, which serves as a method of systematic reflection on one's own activity and presentation of its results for the current assessment of their competences and for control. This is an effective way of rational and transparent promotion of future professionals in the labor market, a way of evaluating opportunities for business, professional and creative interaction of the employer with them.

In our country, when they talk about a folder or a portfolio of individual educational achievements of students, they most often mean understanding and presenting the results obtained in the learning process as a new way of evaluating their performance. With the help of the "portfolio" technology, the student gets the opportunity to present and evaluate his abilities in various fields more or less independently. The moment of self-determination and self-presentation is crucial. The most important goal of the "portfolio" is the possibility of self-knowledge and increasing the reflexivity of students in the learning process, which contributes to increasing their responsibility, the manifestation of independence in the organization of their self-development and self-improvement, and the possibility of self-evaluation of their own results.

A significant aspect of independent work is the practice of students at enterprises, institutions and organizations of the social field, which contributes to the acquisition of experience of independent work during studies at higher education institutions. Professional and practical training of students is carried out in laboratories, workshops, on simulators, and in production during practice. Students take a direct part in the process of real production and provision of services according to the profile of the future profession. The purpose of professional practical training is the practical application of acquired knowledge, the formation of professional competencies. Industrial practice is an integral part of the curriculum and is mandatory for every student. The specific content of professional practical training is determined for each semester of study in accordance with the qualification requirements, which are reflected in the content of curricula and programs for a certain specialty, as well as in accordance with the specifics of the enterprise at which the student undergoes practice.

Thus, independent work is an integral part of systematic training in institutions of higher technical education, contributes to the deepening, expansion and better assimilation of knowledge and self-improvement of the student. This is a conscious, freely chosen, internally motivated, goal-oriented activity determined by the individual and psychological characteristics of the student. It forms the ability to take responsibility, independently solve the problem, find constructive solutions. etc. No

knowledge, not supported by independent activity, can become a real asset of a person. In addition, independent work has an educational value: it forms independence as a property of a person, characterized by two factors: first, a set of means - knowledge, abilities and skills that a person possesses; secondly, the attitude of the person to the process of activity, its results and conditions of implementation; as well as connections with other people formed in the process of activity.

The main task of the students' independent work organization is to create psychological and didactic conditions for the development of intellectual initiative and thinking in any form of training. The transition of all students to individual work with the transition from the formal passive performance of certain tasks to cognitive activity with the formation of one's own opinion when solving the problematic questions and tasks should be an important principle of the organization of the students' independent work. Thus, as a result of independent work, the student must learn to work meaningfully and independently first with educational material, then with scientific information, use the basics of self-organization and self-education in order to further develop the ability to continuously improve his competence.

The desired result from a student's independent work can be obtained only when it is implemented in the educational process as a complete system that permeates all stages of student education in institutions of higher education. It contributes to the deepening and expansion of knowledge, the formation of interest in cognitive activities, mastering the techniques of the cognitive process, and the development of cognitive abilities. That is why it becomes the main reserve for improving the efficiency of specialist training. Therefore, the systematic independent work of students allows creating prerequisites for successful professional activity after completing studies at a higher educational institution, as well as for independent learning throughout life.

A certain contribution to the solution of this problem should be made by the more careful development and introduction into the learning process of modern, scientifically based educational and methodical aids, which, according to the methods used in them for presenting knowledge, deviate from the traditional implementation

characteristic of most educational literature. At the same time, teaching aids should perform not only informational, but also organizational and control functions. In order to increase the efficiency of the student's independent work, the teaching aids should also be supplemented with methodical recommendations that perform only a managing and guiding role. The organizational and control function of the study guide is manifested in the transition to active forms of learning that contribute to the development of students' independent work skills.

The analysis of the results of the research conducted on the basis of National Technical University "Kharkiv Polytechnic Institute" revealed an increase in the ability of students of the experimental group for self-development as a result of the use of independent work, innovative technologies, and psychological and pedagogical support from teachers in the educational process. Their implementation in the educational process contributed to overcoming internal psychological barriers, anxiety, insecurity, fear of the subject, development of social interaction skills and abilities, formation of reflection skills, ability to act independently and make adequate decisions, ability to correct one's own behavior.

Formation of self-regulation is one of the most important and most difficult tasks in the educational process. Its significance lies in bringing the student's capabilities into compliance with the requirements of educational activities, each student must be aware of his tasks as a subject. This can include such methods as self-conviction or self-suggestion, self-approval or self-encouragement, self-punishment, self-command or self-compulsion. They can be positive and negative in terms of content and consequences. Positive self-belief, characteristic of most students of the experimental group, is aimed at self-education, mobilization of physical and intellectual capabilities of the individual. The negativity, which is more often characteristic of students of the control group, on the contrary, causes undesirable conditions, paralyzes their activity.

The task of forming a system of self-regulation in students, necessary for the realization of the set goals, is quite difficult. Such a system consists of realizing the purpose of the activity, the strategy and tactics of its achievement, ensuring the

necessary conditions for its implementation, drawing up and implementing an action program, evaluating the results and correcting the ways to achieve the desired result.

Such work requires the ability to model, which is related to the thinking process, the ability to compare and generalize, the mastery of which is the basis of cognitive activity and independence of students. Therefore, in order to solve the identified tasks, it is advisable to pay more attention to the ways and methods of modeling in the educational process of the higher school. In fact, modeling is the basis of studying any subject, as well as a method that a teacher uses in the process of his innovative activity [78].

Modeling includes observation and description of effective mechanisms for achieving set goals. At the same time, complex actions or their series are broken down into separate components, which makes it possible to recreate the object in one way or another. It is important to establish the most significant elements necessary to achieve the result. The information transmitted through modeling contributes to increasing the volume of knowledge and skills.

The main types of material modeling are physical and analog. In turn, ideal modeling is divided into intuitive and iconic. Ideal modeling usually precedes the material one, because before building a material model, a person mentally builds its image.

In the process of acquiring experience of independent work by students, pedagogical modeling is of great importance. Scientists give the following definition of it: "Pedagogical modeling is usually understood as the development of goals, (general idea) of creating pedagogical systems, processes or situations and the main ways to achieve it" [79]. It consists in creating imaginary situations that require solving pedagogical problems. The practical value of the model is mainly determined by its adequacy to the studied aspects of the object, as well as by how correctly the basic principles of modeling are taken into account - visibility, certainty, awareness, objectivity, which most often determine both the capabilities and type of the model, and its functions. The effectiveness of modeling depends on the initial theories and

hypotheses, which indicates the degree of simplifications allowed, to which all researchers attach particular importance.

Possession of the modeling technique is associated both with the general method of scientific knowledge, and with the need to solve psychological and pedagogical problems. Modeling acts as a way of generalizing the educational material, as well as its presentation in a collapsed form. It is quite widely used for logical ordering, building semantic schemes, presenting educational information in a visual form, based on figurative associations using mnemonic rules. The process of modeling professional and social situations creates a system of cognitive enrichment of students and their development in their professional field in the future. It teaches students to look at the situation both at the micro level, in terms of the impact on the participants in the interaction, and at the macro level, in terms of the impact of the situation on the environment, which contributes to the formation of global professional thinking. Such experience gives students the opportunity to develop creative abilities, going beyond the learning process, to acquire the ability to defend their opinion.

It is important to organize the work of students in such a way as to create conditions for fruitful modeling of the main production processes, management situations, communication processes in the group when solving the tasks. Such models will contribute to the acquisition of specialized knowledge and the acquisition of independent work experience, as a result of which the intellectual, emotional, strong-willed and other qualities of the individual are formed, and the focus on successful professional activity. The idea of its content and character will come into line with the life goals, interests and aspirations of future specialists. The appropriate nature of interpersonal relationships is formed, the skills of creating and maintaining a favorable psychological climate in the group are formed.

The use of simulation in the learning process contributes to solving real problems, anticipating the consequences of various actions, and the corresponding change in behavior. The task of behavior modeling is to create a practical map or "model" of a given behavior that anyone can reproduce. Its purpose is to establish the most significant elements of thinking and actions necessary in order to achieve a certain

result or reaction. The instrumental application of models of cognitive strategies or forms of human behavior implies their embodiment in structures that can be used for any practical purpose.

The practice of modeling life situations can also become a tool in the multifaceted self-education of students, which includes personal activities aimed at developing desirable physical, mental, moral, aesthetic qualities, positive traits of will and character, eliminating negative habits, realizing knowledge about oneself as a future professional; understanding the importance of educational and professional activities in one's life.

Self-education relies on learning, but is not limited to it. It sets itself the task of accustoming the student to self-development and constant self-improvement. Self-education occurs at a certain stage of human development and is the result of education. It can be said that self-education is a dynamic process of self-development guided by the individual, although these concepts cannot be equated. Self-development turns into self-education when it becomes under the control of consciousness, and a person consciously begins to improve his Self.

A goal or requirement that was imposed by other people can become a student's own if it contributes to the satisfaction of certain of his needs or is a stage or means of their satisfaction. In this case, the student will act not as a passive performer, but as an active participant, this will contribute to greater involvement of the student in the activity. The transformation of external requirements into individual goals is one of the principles of a person-oriented approach to education. Therefore, in the process of professional training of future engineers, it is useful to create the most favorable conditions for stimulating the development and self-development of their needs, interests, and intentions.

The goal of using modern pedagogical tools and, in general, education and upbringing can be considered to help the student see his purpose, his own self-worth, stimulate the desire for self-development and self-improvement, conscious and emotional acceptance of the chosen profession, which brings pleasure and makes sense of his life; understanding of the creative nature of professional activity, which requires

constant work on oneself. And then the result of conscious management of the process of one's own development is the self-actualization of students' potential in activities and self-realization in life.

At the same time, the modernization of the structure of higher professional education in our country requires changes in the legislative and regulatory framework, taking into account the requirements of the European system of standards and certification to ensure the competitiveness of graduates on the national and international labor markets.