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# FORMING META-SUBJECT COMPETENCIES IN THE SYSTEM OF SECONDARY VOCATIONAL EDUCATION

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## *Abstract*

The article deals with the problem of forming meta-subject competencies in terms of professional training. The "meta-subject competence" phenomenon is presented in the psychological and pedagogical literature abstractly; meanwhile the implementation of the requirements of the Federal State Educational Standard for meta-subject results is difficult for the professional pedagogical community. There are different ways of understanding meta-competencies in technical and humanitarian spheres. The most appropriate way to form them, as we see it, is to use the meta-subject, which is considered as the principle of integration of the educational content, and as a way of forming theoretical thinking and universal activity methods. The meta-subject competencies within the framework of secondary vocational education (SVE) phenomenologically represent the unity of the fundamental knowledge, skills, practical experience that is manifested and used by a person in integrative, inter-subject activity. From the perspective of psychological science, these are new forms that are developed on the basis of general professional and personal qualities. These may include regulatory, communicative and cognitive abilities. For example, to assess the students' regulatory meta-subject competence, we may use indicators that formalize student's ability to set goals, plan, organize, control, evaluate, and correct. The communicative component of meta-subject competence is determined by the ability to cooperate, to perform certain role functions, to present the results of their activities. Cognitive competence is characterized by attention, memory, perception and thinking. Here we also investigate the effectiveness of pedagogical methods of forming meta-subject competencies in the system of secondary vocational education.

## 1. Introduction

Forming general and professional competencies in the context of vocational training is one of the key tasks outlined in the Federal State Educational Standards of the secondary vocational education system (hereinafter - FSES). To implement this task it is necessary to use a meta-subject approach, which is considered as a principle of integrating the content of education and as a way of forming theoretical thinking and universal methods of activity. It is designed to ensure the transition from the existing practice of dividing knowledge into objects to a holistic imaginative perception of the world, i.e. to meta-activity (Hutorskoy, 2013).

The educational process in a professional school is based on a competency-based approach. In this regard, it is appropriate to consider the meta-competencies formation as a pedagogical problem of the professional development of a vocational student. An educational route that monitors the degree of mastering the necessary competencies by a student will depend on correctly selected pedagogical tools, methods, and technologies. The implementation of the requirements of the standard for meta-subject results is difficult, which is a very urgent problem. We see the contradiction between the need to form meta-subject competencies as the basis for continuing education and the lack of development of methodological support for this process at each stage of education. FSES establishes a list of competencies, but does not give recommendations for their formation; therefore, teachers themselves have to determine the methods, means and tools for their organizational and pedagogical activities in this direction.

## 2. Problem Statement

The analysis of ways to solve the problem of forming meta-competence among SVE students conducted from the philosophical, psychological and pedagogical aspects shows that this problem has not been solved in pedagogical theory and practice yet. Moreover, in the psychological and pedagogical literature, the understanding of this phenomenon is presented abstractly. Here is an example of the opinion of two researchers. Kolmakova (2013) defines meta-subject competencies of students as "a system of universal educational actions that allow students to efficiently perform regulatory, cognitive and communicative tasks" (p. 24). Greshilova (2014), in her turn, under meta-subject competencies refers to "the unity of the fundamental knowledge, skills, practical experience that are manifested and used by a person in integrative, intersubject activity" (Gippenreiter, Bubble, & Arkhangelskaya, 1982, p. 86).

We believe that the reason for the high level of abstraction here lies in the specific character of professional training. The content of metacompetencies will be different for representatives of technical and humanitarian. A deeper study from the standpoint of phenomenology and existentialism shows that the content of metacompetence can have the invariable and variable parts. It is the variable part that will reflect the specific character of the profession. In this regard, the professional pedagogical community is faced with the task of determining the list of metacompetencies in accordance with the direction of training, identifying indicators and indices of their specifications, developing tools and conditions for their formation in a vocational education institution.

Our research tasks are related to the study of forming two metacompetencies – professional mobility and professional self-determination of a vocational student (Plyaskina, 2016). To study this issue, we

analyzed the correlation of these competencies and the set of general competencies of the educational standard of secondary vocational education, determined the level of study of the concepts of professional mobility and professional self-determination by the pedagogical theory and practice, identified the theoretical and methodological foundations for the development of professional mobility and professional self-determination of students of secondary vocational education, and highlighted the features of the organization of the educational process that contribute to the development of the meta-subject competencies.

## 3.    Research Questions

The third generation standard for SVE system includes nine general and a number of professional competencies (depending on the major). In our opinion, they can be "transformed" into meta-subject competencies, such as professional mobility and professional self-determination.

A modern pedagogical dictionary interprets professional mobility as an opportunity and ability to successfully switch to another activity or change the type of work. It involves the possession of a system of generalized professional methods and the ability to effectively use them to perform any tasks in related fields and to move from one activity to another relatively easily. It implies a high level of generalized professional knowledge, readiness for the prompt selection and implementation of optimal methods for performing various tasks in the field of their profession. In the context of rapid changes in engineering and production technology, professional mobility is an important component of the qualified structure of a specialist (Rapatsevich, 2001). We find consistent discussions of the related topics in the works of Amirova (2006). The author considers professional mobility as a value-semantic construct of the personality, distinguishes its essential characteristics (integrity, complementarity, coherence) and offers its structure as a system quality of components - activity, willingness, adaptability, creativity (Amirova, 2006). Continuing the research in the proposed manner, we included professional mobility in the list of metacompetencies and determined its component composition for students of technical specialties. For this, we used the expert survey method at enterprises, and as a result we identified 4 main components: willingness, responsibility, activity and adaptability. Collectively, the selected components make a system, the formation and development of which solve the problem of the meta-subject approach in the professional education of a modern vocational education institution (Pryadein, 2014).

Meta-subject competence, expressed as professional self-determination, is an independent, conscious and voluntary structure, adjustment and implementation of professional prospects. All this involves the choice of a profession, obtaining vocational education and improving in this professional activity (Pryazhnikov, 1999). The essence of professional self-determination is the search and finding personal meaning in the chosen, mastered and already performed labor activity, as well as finding the meaning in the process of self-determination (Pryazhnikov, 2007). Professional self-determination relates to such concepts as self-actualization, self-realization, self-fulfilment, self-transcendence, for example, Rubinstein (1973), in his works, considered self-determination in the context of determination (p. 62), under the word "self-actualization" A. Maslow represents the continuous realization of potential capabilities, abilities and talents, as the fulfillment of his / her mission, or calling, fate, etc., as a more complete cognition

and, therefore, acceptance of one's own primordial nature, as a relentless pursuit of unity, integration, or internal synergy of a person (Maslou, 1982).

Professional self-determination consists of the elements that we identified by interviewing the professional community (vocational education institutions and technical schools of the SVE system). The results of the survey allowed us to highlight 4 elements of professional self-determination: orientation to the professional future, interest in the profession, discipline and responsibility (Prokudina, 2013).

In our opinion, the formation of meta-subject competencies involves including each student into various types of activities (scientific-cognitive, problem-research, design and creative) (Hutorskoy, 2012, p. 9). In addition, the educational process needs the integrated use of technologies, methods and techniques that are relevant to the tasks of health conservation, design, game, problem-based learning, etc. It is also important to update certain requirements for a modern classroom activities:

- clear planning of the activities for the teacher and students during the lesson;

- motivation of students;

- intensification of students' activity at each stage of the lesson (the creation of problem-based, research situations, variety of activities);

- the lesson should take the form of cooperation, co-creation of the teacher and students;

- the level and opportunities of students should be taken into account;

- reflection as an indispensable component of summarizing the training session.

In connection with the above said we suggest using the following methods in the teaching process:

- method of creating positive motivation (emotional stimulation, taking into account the student's personal achievements, creating psychologically comfortable learning conditions);

- methods of organizing cognitive and practical activities of a student (solving practical matters, educational and quasi-professional designing);

- reflective-evaluative methods (analysis of control results, diagnosis of educational difficulties);

- methods of developing a personal educational learning environment (practical orientation, attracting the student's personal experience, working with additional sources of information).

## 4. Purpose of the Study

Purpose of the study is to analyze meta-subject competencies for the SVO system and to explore the forming such meta-subject competencies as professional mobility and professional self-determination.

## 5. Research Methods

While solving the research problem we used the following methods:

- theoretical research, including: interdisciplinary analysis and data synthesis from philosophical, sociological, natural science, psychological and pedagogical literature; analysis of foreign and domestic psychological and pedagogical experience in the formation of a mobile personality and professional sustainable self-determination of students in educational systems; generalization of these research results in order to identify patterns of development of the studied phenomenon, etc.;

- empirical methods: observation, interviewing, questionnaires, the method of expert evaluations and self-assessments, analysis of the products of students' activities, description, generalization and systematization of the obtained data.

## 6. Findings

Assuming that the personal idea of "professional mobility" will have its own meaningful content for different types of professional activities, we asked the employees of the oil and gas industry enterprises to act as experts, identify and rank the qualities they consider important for the development of professional mobility (it was necessary to note how important each of the proposed qualities is for the development of a professionally mobile personality) (Pozdnyakova, 2010). The survey results were as follows: in the first place, our experts put forward adaptability (flexibility), in the second place was the willingness to perform specific specific professional tasks, and responsibility and activity were put in the third place. Thus, the structure of the metacompetence "professional mobility" was manifested - adaptability (professional flexibility), professional readiness, professional responsibility and professional activity (Klimov, 2004, p. 109).

In ensuring the functioning of the quality management system of vocational education, an important role belongs to the scientifically sound, carefully planned and rationally organized control of the process and the results of specialist training. This is due to the fact that control is intended not only to record and evaluate the results of specific, completed stages of training, but also to regulate the educational process and to purposefully formulate meta-subject competencies among future specialists. In our opinion, it is important to carry out control and evaluation activities at each stage of the lesson. It is very important for the teacher to be able to create his/her own control system that will meet common standards and which will be effective. The system of control and evaluation measures that we developed is a tool that will contribute to the development of professional mobility components. The important thing in preparing tasks and implementing control and evaluation activities is their variability, variety of forms, different levels, which contributes to the development of the student "educational strategy". We believe that the selected meta-subject competencies can be formed when studying the range of disciplines.

To study the level of representation of these qualities in the personality structure of vocational education institution students, we used the "plan with preliminary and final testing and control group" scheme, where by the independent variable (X) we mean the system of control and evaluation measures, and by the dependent variable (O) development components of professional mobility.

Students of 2-3 courses are divided into 2 groups (experimental – 111 students and control – 102 students).

To determine the level of activity, responsibility and adaptability, we tested students of the experimental and control groups at the initial stage of studying the discipline and at the final stage using the following methods: diagnosis of motivators during social and psychological activity of a person (Fetiskin, Kozlov, & Manuylov, 2002), express-diagnosis of responsibility (Pryadein, 2014), self-assessment of psychological adaptability (Fetiskin, Kozlov, & Manuylov, 2002).

For the experimental group the following results were obtained:

At the initial stage of the study (111 students). Study the tables 01-08.

**Table 01.** Readiness

| «2» 0-2.5 points | «3» 3-3.5 points | «4» 4-4.5 points | «5» 5 and higher |
|---|---|---|---|
| 68 students | 26 students | 9 students | 8 students |
| 61.3% | 23.4% | 8.1% | 7.2% |

**Table 02.** Activeness

| Level Point | Success achievement in general | Determination for power | Tendency for group acknowledgement and respect |
|---|---|---|---|
| High 19 and higher | 94 students (84.7%) | 43 students (38.7%) | 90 students (81%) |
| Average 8-18 | 17 students (15.3%) | 67 students (60.4%) | 21 students (19%) |
| Low 7 and lower | 0 students (0)% | 1 student (0.9%) | 0 students (0%) |

**Table 03.** Responsibility

| Responsible 86-60 points | Contextually responsible 59-37 points | Non-responsible 36-12 points |
|---|---|---|
| 49 students (44.1%) | 62 students (55.9%) | 0 students (0%) |

**Table 04.** Adaptiveness

| High level 8-10 points | Less than average 6-7 points | Average level 5 points | Lower than average 3-4 points | Low level 2-lover than 1 |
|---|---|---|---|---|
| 11 students (9.9%) | 24 students (21.6%) | 21 students (18.9%) | 29 students (26.1%) | 26 students (23.5%) |

At the final stage of the study (110 students)

**Table 05.** Readiness

| «2» 0-2,5 points | «3» 3-3,5 points | «4» 4-4.5 points | «5» 5 and higher |
|---|---|---|---|
| 15 students | 35 students | 26 students | 34 students |
| 13.6% | 31.8% | 23.6% | 31% |

**Table 06.** Activeness

| Level Point | Success achievement in general | Determination for power | Tendency for group acknowledgement and respect |
|---|---|---|---|
| High 19 and higher | 78 students (70.9%) | 54 students (49%) | 78 students (70.9%) |
| Average 8-18 | 32 students (29.1%) | 56 students (51%) | 32 students (29.1%) |
| Low 7 and lower | 0 students (0%) | 0 students (0%) | 0 students (0%) |

100

**Table 07.** Responsibility

| Responsible<br>86-60 points | Contextually responsible<br>59-37 points | Non-responsible<br>36-12 points |
|---|---|---|
| 60 students (54.4%) | 50 students (45.5%) | 0 students |

**Table 08.** Adaptiveness

| High level<br>8-10 points | Less than average<br>6-7 points | Average level<br>5 points | Lower than average<br>3-4 points | Low level<br>2-lover than 1 |
|---|---|---|---|---|
| 20 students<br><br>(18.2%) | 31 students<br><br>(28.2%) | 14 students<br><br>(12.7%) | 22 students<br><br>(20%) | 23 students<br><br>(20.9%) |

Having analyzed the indicators for the components of professional mobility, readiness, adaptiveness, responsibility and activity, we can draw to the following conclusions:

- due to the control and evaluation activities, the readiness in the experimental group increased by 23.8%;

-responsibility increased by an average of 10.3%;

-adaptivity increased by an average of 8.3%;

-activity of students decreased by an average of 13.8%.

Processing and analysis of the results of experimental work, systematization of the material, evaluating the effectiveness of the didactic system of control and assessment activities in a technical vocational education institution, the formulation of conclusions showed the appropriateness of using control and evaluation measures for the development of professional mobility components of students of a technical vocational education institution.

It seems relevant to conduct further research to find effective assessment tools for the development of professional student's mobility.

The structure of the metacompetence "professional self-determination" consists of 4 elements: orientation to the professional future, interest in the profession, discipline and responsibility. The structure was determined by the method of interviewing the professional community (3 institutions of the SVE system and 100 teachers). Teachers had to choose 3 characteristics that reflect the essence of professional self-determination among students of the SVE system. The following characteristics were brought to the forefront: orientation toward the professional future – 22%, interest in the profession – 22%, discipline – 10%, responsibility – 8%), learning -7%, confidence in professional choice – 6%, sociability – 6%.

To determine the primary level of professional self-determination, we conducted a survey of the 1st year students using the following methods: methodology for studying the status of professional identity (Gretsov & Azbel, 2006), diagnosis of the level of professional orientation of students (Dubovitskaya, 2002), and diagnosis of responsibility, test "Express–Diagnosis of Responsibility" (EDI) "(Pryadein, 2014), "Discipline" (together with N.V. Vorotnikova) (Pryadein, 2014, p. 56).

Based on the goal of determining the primary level of professional self-determination, as well as data obtained as a result of a theoretical analysis of scientific psychological and pedagogical literature, we developed a questionnaire consisting of 4 blocks of questions on professional self-determination. The

questionnaire consisted of 192 questions, 162 1st year students took part in the survey. Analyzing the results of the survey on such elements of professional self-determination as orientation toward a professional future, interest in the profession, discipline, responsibility, we made the following conclusions:

1. Orientation to the professional future (professional identity): uncertain – 35 people, imposed – 38 people, crisis of choice – 49 people, formed – 40 people.

2. Interest in the profession: a low level of professional orientation was demonstrated by 37 people, an average level - by 95 people, a high level – by 30 people.

3. Responsibility: 76 people consider themselves responsible, 86 people have contextual responsibility.

4. Discipline: a high level of discipline was shown by 22 people, above an average – by 26 people, an average level – by 67 people, below an average – by 26 people, a low level – by 21 people.

The initial study of professional self-determination level allows us to conclude that at the initial stage of professional training in a vocational education institution an unstable professional self-determination and an average level of professional orientation are traced. The noted results showed that the process of professional self-determination of first-year students of the SVE system takes place at different rates, which is due to both the students' individual characteristics of and the conditions of pedagogical regulation of this process (Yarovaya, 2015).

The development of professional self-determination and the achievement of its sustainability can be achieved through quasi-professional activity in the context of a special form of lesson and extracurricular work, for example, through a media-school created in a vocational education institution. The goal of the media-school is to actualize the process of sustainable professional self-determination of students through the special organization of their activities, including the study of their personal characteristics and obtaining knowledge about the world of professions.

## 7.   Conclusion

The FSES establishment of new educational results with the inclusion of meta-subject competencies requires the implementation of a new methodological approach to the educational process, focusing the teaching practice not only on the awareness and understanding of educational information, but also on the formation of meta-subject competencies. Assessment of the achievement of meta-subject results can be control and evaluation activities that contribute to the formation of general, professional competencies, personal qualities of the student, as well as their inclusion in real quasi-professional activity. We conducted the analysis of the relationship of control and evaluation activities with the components of professional mobility, and developed indicators and indicators for their assessment.

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