

## ADVANCED VOCATIONAL TRAINING OF SCHOOLCHILDREN: PHILOSOPHICAL ASPECTS OF UNDERSTANDING

### Abstract

The study aims to determine the philosophical and methodological aspects of advanced vocational training for students at school. The article uses philosophical methods to identify the main approaches of modern philosophy to the problem of advanced vocational training. A set of empirical methods was applied: literature study, survey (oral and written). To achieve the goal, the following tasks were solved: considering approaches to the concept of advanced vocational training of schoolchildren; highlighting the main aspects of advanced vocational training of schoolchildren; studying the current condition of the arrangement of advanced vocational training of schoolchildren. The problem of this research lies in the issue of disclosing the structure of advanced vocational training. Four units were identified, by the development of which one can judge on the degree of orientation of the educational process in a school towards the vocational training of students. The results of a survey of schoolchildren revealed that the most developed unit of advanced vocational training is the formation of meta-subject competencies, taking into account the professional orientation of the student. Similarly, with meta-subject competencies, average indicators are observed in the assimilation of labour skills.

*Keywords:* philosophical aspect, advanced training, technological education, vocational education, technology, school education.

### Introduction

In modern times, it is already difficult to imagine what technologies will be like in ten or twenty years (Vorontsova, Arakelyan, & Baranov, 2020). The twenty-first century is characterized by significant changes in the professional and educational fields (Jüttler, Schumann, Neuenchwander, & Hofmann, 2021; Mikhailov, Tikhonov, & Margarov, 2022).

The fourth industrial revolution or Industry 4.0 and rapid changes in professions lead to a rapid change in the world so that the content of education does not have time to update, what with the coronavirus pandemic, having a significant impact on all areas of human life, technological discoveries, increased life expectancy - all this undermining the traditional established practices of education and training of specialists

(Moiseev, Pastukh, Nitsevich, & Stroeve, 2021; Tikhonov & Novikov, 2020).

The twenty-first-century workplace is more dynamic than ever, and people need to be prepared to make many career decisions (Husain & Mahfoodh, 2021; Tsakissiris & Grant-Smith, 2021; Kabakus & Senturk, 2020; Craps, Pinxten, Knipprath, & Langie, 2020). Accordingly, schools are now facing the challenge of preparing students for career transitions and lifelong learning to enable individuals to acquire new skills and navigate an uncertain future with confidence (Moon & Hong, 2022; Fung, Taal, & Sim, 2021; Knipprath, 2013). A successful person in the 21<sup>st</sup> century should acquire a good profession and be ready for self-improvement, including vocational retraining, which often outpaces the actual pace of change in the professional sphere.

The problem of this study lies in the issue of disclosing the structure of advanced vocational training.

This article aims to determine the philosophical and methodological aspects of advanced vocational training for students at school.

To achieve the goal, the following tasks were solved:

- Considering approaches to the concept of advanced vocational training of schoolchildren.
- Highlighting the main aspects of advanced vocational training for schoolchildren.
- Studying the current state of the organization of advanced vocational training for schoolchildren.

### Literature Review

It is necessary to determine the essence of advanced training. The term “to advance” is defined in the dictionary of the Russian language by Ozhegov S. I. (2010) as “moving in the same direction with someone or something, to be ahead, overtake” (p. 1664). In the explanatory dictionary by V. Dahl (1998), “to be ahead” means “to get somewhere on time, or succeed in something earlier, before another one” (p. 704).

For further discussion, it is necessary to dwell on several definitions. By *vocational training*, we mean “the process of acquiring knowledge, skills and abilities enabling one to perform work in a particular field of activity.” This definition can be found in S. M. Vishnyakova’s research (1999) on vocational education and in the new dictionary of methodological terms and concepts by E. G. Azimov and A. N. Shchukin (2009). We were unable to detect any ambiguity or fundamentally different interpretations.

We will understand the concept of *advance* in the following context: we do something not to catch up on something but to foresee (prevent) it. Such an understanding of the term *to advance* does not contradict the definitions of being ahead of something in works in pedagogy (Sedov & Kashfrazyeva, 2022).

Before introducing this term, Karl Marx also thought about those issues. When considering the anticipation of the results of a person’s activity, he said: “The worst architect initially differs from the best bee in that before building a cell of wax, he has already built it in his head. At the end of the labour process, the result is obtained, which has already been presented in the person’s mind at the beginning of the process, i.e., ideally. Not only does a man change the form of what is given by nature; in what is given by nature, he also fulfils his conscious goal, which, as a law, determines the way and nature of his actions and to which he must subordinate his will” (Marx & Engels, 1960).

Among the terms *advanced education*, *advanced training*, and *advanced upbringing*, the *mutual conditionality is exactly the same as education, training, and upbringing*. All subordination is preserved. The term *technical training* is equal in its meaning to *advanced training*. Further, we will say “*advanced training in the profession*” or “*advanced vocational training*”.

The concept of *advanced training* is revealed in the works of various scientists in the field of education, philosophy, sociology, physiology, psychology, the system of general education, and the system of vocational education. In each case, the definition of *advanced vocational training* receives a specific context for a specific science (Novikov, 2002; Bim-Bad, 1988; Vygotsky, 1982).

With a number of formulations of different scientists, each treating advanced training in its spectrum and giving a slightly modified, but semantically not very different formulation, and with the fact, the formulations considered above do not contradict each other, we do not see the point of formulating our fundamental vision of the term. We will imply that *advanced professional training* is understood as the wording suggested by A. M. Novikov (2000), speaking about it in a broad sense: “keeping ahead”, which manifests itself “in the interaction of the content and the process of transferring knowledge structured

in a certain way and is aimed at developing a human predisposition to master it, with the result showing in the ability to increase knowledge” (p. 42) actively.

The advanced professional training of schoolchildren has a specific philosophical meaning and relevance. The current social order for education sets new tasks for the school due to changes in society, the economy in general, and the world of professions in professions particular. The new educational standard, the exemplary basic educational program of primary general education (EPEP 2015 as amended in 2020), the concept of teaching technology (2018), and several government documents dictate the need to find and implement new solutions in the technological preparation of schoolchildren. Technological training of schoolchildren, like no other subject area, is responsible for further professional self-determination, choosing a profession and - awareness of the possibility of further diversity in these professions (Bochkareva et al., 2020; Kamaeva, Zemsh, Gilmanshina, & Galich, 2021).

On May 7, 2018, a decree of the President of the Russian Federation “On the national goals and strategic objectives of the development of the Russian Federation for the period until 2024” was issued, stating the need to update the content and improve methods of teaching the subject area “Technology” and on December 29, 2018, the *Concept of teaching the subject area “Technology”* (The concept of teaching the subject area “Technology” in educational institutions of the Russian Federation, implementing the main general education programs, 2018) was prepared in educational institutions of the Russian Federation that implement the main general educational programs (from now on referred to as the *Concept*). The main goal of the *Concept* is to create conditions for the training of specialists capable of mastering and developing priority areas of scientific and technological progress in the development of the Russian Federation.

The concept involves implementing three main areas we summarize below in the form of a table (Table 1).

Table 1.

The Main Content Fields of the Subject Area “Technology”

Content fields	Description
First content field	introduction to the context of the creation and use of modern and traditional techniques, the technological evolution of humankind, its patterns, modern trends, and the essence of innovation;
Second content field	gaining experience in personalized action and labour education in the process of developing technological solutions and their application, studying and analyzing the changing needs of an individual and society;
Third content field	introduction to the world of professions, including those of the future, professional identity (professional tests based on types of work, labour market structure, innovative entrepreneurship and their organization in the region of residence, WorldSkills standards).

These vectors of development aim to prepare students for professional activities in the new realities. Furthermore, taking into account the dynamics of the labour market and the unprecedented pace of modernization in this area, the main task of technological education is not just to acquaint students with the modern world of

professions but to prepare them for the professions of the future and prepare them for the changing market conditions.

Of particular relevance is the issue of organizing advanced vocational training for students in a secondary school.

## Methodology

The article uses philosophical methods to identify the main approaches of modern philosophy to the problem of advanced professional training. The methodological basis of the study is general scientific methods of cognition, including analysis and synthesis (as a general methodological approach), comparison, generalization, and methods of systemic, complex, logical, structural, comparative and statistical analysis. These methods have been used in different combinations and at different stages of the study, depending on the goals and tasks to be solved. This, of course, has helped to ensure the reliability of the analysis and the validity of the conclusions made by the author.

The article uses theoretical methods: the method of systemic analysis of knowledge, abstraction and concretization, and analogy.

A set of empirical methods has been applied: literature study, questioning (oral and written) of documents, performance results, and observation. Empirical methods were also used, reflecting the methods and forms of organization of research activities: questioning, monitoring, studying and generalization of experience.

As part of the study of the structure of advanced professional training of schoolchildren, a survey was conducted among students in grades 8 and 9. 153 students took part in the survey. The average age of the respondents is 15 years. The survey was conducted using anonymous questionnaires and testing. The survey was made possible thanks to the school's director, class teachers, teachers and parents of students.

The questionnaire included 15 points, where students had to put down scores from 0 to 5 following the degree of agreement with the statements (Table 2).

*Table 2.*

List of Statements for Conducting a Survey of Students in Grades 8 and 9

Statement	Scores (0-5)
1) When doing homework, the teacher allows me to consider my professional plans for the future.	
2) During my answer at the lesson, the teacher always asks to clarify what value the new knowledge or mastered action has for me personally.	
3) The teacher often asks us to independently come up with and complete a task on the topic covered.	
4) Each of the students periodically prepares and delivers a report on the prospects for the development of the profession studied and the position within the profession he can personally practice.	
5) During classes, we often team up with other students and fantasize about what professions will be like in the future.	
6) Theoretically and practically, by getting acquainted with various technologies, we determine which professions are associated with them and whether we can find our profession in this area.	
7) If any profession attracts me, then I try to get detailed information about it and understand what I personally lack in order to take the appropriate position.	
8) When doing a practical task, I always try to understand whether I can do it professionally in the future and why.	
9) Performing practical actions, I always fantasize about how it could be in the future.	
10) We conduct educational research, identifying the need of the labour market for those professions that we like most of all.	
11) I explore the professions that interest me and highlight the qualities I need to develop.	
12) At the lessons, we learn how to write a resume, have interviews and present ourselves to the employer.	

13) The teacher gives everyone the same tasks, each having the correct answer.	
14) We never talk about what this or that profession will look like in the future.	
15) I rarely think about my future profession, imagining it only in general terms.	

The thirteenth, fourteenth, and fifteenth statements were the test for the students on the veracity of the answers. The thirteenth point tested the first point, the fourteenth – the fourth one, and the fifteenth – the seventh point, respectively.

### Research Results and Discussions

We have determined students' competencies through their ability to perform certain actions. The concept of advanced vocational training for schoolchildren will differ from that of an adult, particularly in its vagueness and lack of a final result - it cannot be reached at school because there is too much time before schoolchildren enter adult professional activity. They themselves will change, and the world will change, so students cannot make a final decision at school. Children can learn how to learn. Advanced professional training consists of the following units and determines the individualization of technological education, the professionalization of meta-subject competencies, basic professional actions, orientation in the world of professions and employment.

Each of these four units is given the corresponding competencies of students, characterized by the following components:

1<sup>st</sup> unit - Individualization of technological education. Relevant competence in this unit is:

- The student can independently correct (clarify, concretize) the content of the educational task, coordinating it as much as possible with his own characteristics and interests, justify the decision, perform the action and present its results.

2<sup>nd</sup> unit - Professionalization of meta-subject

competencies. Relevant competencies in this unit are:

- The student is able to characterize professions, including taking into account the main trends in their development, using subject and interdisciplinary concepts, and correlating professions and universal educational activities necessary for their successful development.
- The student can independently plan his professional future and build an individual trajectory of their achievement within the framework of educational activities and cooperation with teachers and peers.
- The student is able to work with information about the content of professions and requirements for employees.

3<sup>rd</sup> unit - Basic professional actions. Relevant competencies in this unit are:

- The student can implement basic professional activities, assuming the prospects for their technological development and determining the possibility of linking their professional future with these activities.

4<sup>th</sup> unit - Orientation in the world of professions and employment.

Relevant competence in this unit is:

- The student is able to determine a profession that is attractive for him from the standpoint of his own interests and opportunities, evaluate labour market offers and build an individual trajectory for entering the attractive profession.

For each competence, the primary descriptors or criteria for the formation of this competence are identified to detail the content of the competence; they are as follows:

Table 3.

Competences, Criteria, Indicators of the First Unit –  
“Individualization of Technological Education”

Competence	Descriptors (criteria)	Indicators (markers, from the student's point of view)
The student is able to independently correct (clarify, concretize) the content of the educational task, coordinating it as much as possible with his own characteristics and interests, justify the decision taken, perform the action and present its results.	1) Formulation of training tasks, suggesting the possibility of their adjustment by students	1) When doing homework, the teacher allows me to consider my own professional plans for the future.
	2) Justification by students of the expediency of their actions	2) During my answer at the lesson, the teacher always asks to clarify what value the new knowledge or mastered action has for me personally.
	3) Fulfillment of one's own (not unified) training tasks	3) The teacher often asks us to independently come up with and complete a task on the topic covered.
	4) Presentation of the results of the completed training activities with the rationale for their individual focus	4) Each of the students periodically prepares and delivers a report on the prospects for the development of the studied profession and the position within the profession he can personally practice.

Descriptors of the First unit, No. 1 competencies (Table 3):

1. Formulation of training tasks, suggesting the possibility of their adjustment by students.
2. Justification by students of the expediency of their actions.
3. Fulfillment of one's own (not unified) educational tasks.
4. Presentation of the results of the completed training activities with the rationale for their individual focus.

Table 4.

Competences, Criteria, Indicators of the Second Unit  
“Professionalization of Meta-Subject Competencies”

Competence	Descriptors (criteria)	Indicators (markers, from the student's point of view)
1. The student is able to characterize professions, including taking into account the main trends in their development, using subject and interdisciplinary concepts, and correlating professions and universal educational activities necessary for their successful development.	1) Implementation of educational projects (individual/group) to correlate labour activities and professions involving them, taking into account the main trends in the development of the professional sphere (as part of the development of the module).	5) During classes, we often team up with other students and fantasize about what professions will be like in the future.
2. The student can independently plan his professional future and build an individual trajectory for their achievement within the framework of educational activities and cooperation with teachers and peers.	2) Acquaintance with the world of professions, performing professional tests, assessing the correspondence of professions to desires and individual psychological, physiological and other characteristics, and assessing the ability to work in a profession throughout life.	6) Theoretically and practically, getting acquainted with various technologies, we determine which professions are associated with them and whether we can find our profession in this



		area.
3. The student is able to work with information about the content of professions and requirements for employees.	3) Concretization of ideas about one's professional future based on versatile information about the world of work, the ability to determine one's own competence deficits and surpluses, taking into account information about the profession, to find information on ways to eliminate deficits.	7) If any profession attracts me, then I try to get detailed information about it and understand what I personally lack in order to take the appropriate position.

The 2<sup>nd</sup> unit, competence No. 1 (Table 4):

1) Implementation of educational projects (individual/group) to correlate labour activities and professions involving them, taking into account the main trends in the development of the professional sphere (as part of the development of the module).

2<sup>nd</sup> unit, competence No. 2:

2) Acquaintance with the world of professions, performing professional tests, assessing the correspondence of professions to desires and

individual psychological, physiological and other characteristics, and assessing the ability to work in a profession throughout life.

2<sup>nd</sup> unit, competence No. 3:

3) Concretization of ideas about one's professional future based on versatile information about the world of work, the ability to determine one's own competence deficits and surpluses, taking into account information about the profession, to find information on ways to eliminate deficits.

Table 5.

Competences, Criteria, Indicators of the Third Unit "Basic Professional Actions"

Competence	Descriptors (criteria)	Indicators (markers, from the student's point of view)
The student can implement basic professional actions, assuming the prospects for their technological development and determining the possibility of linking their professional future with these actions.	1) The student performs basic professional actions (in accordance with the curriculum), explaining their meaning.	8) When doing a practical task, I always try to understand whether I can do it professionally in the future and why.
	2) The student assumes the prospects for the technological development of basic professional activities.	9) Performing practical actions, I always fantasize about how it could be in the future.

Descriptors of the 3<sup>rd</sup> unit, competencies No. 1 (Table 5).

1) The student performs basic professional actions (in accordance with the curriculum), ex-

plaining their meaning.

2) The student assumes the prospects for the technological development of basic professional activities.

Table 6.

Competences, Criteria, Indicators of the Fourth Unit  
"Orientation in the World of Professions and Employment"

Competence	Descriptors (criteria)	Indicators (markers, from the student's point of view)
The student is able to determine a profession that is attractive to him from the standpoint	1) The learner uses existing information resources and personal relationships to evaluate labour market offers.	10) We conduct educational research, identifying the need of the labour market in the professions that we most like.

of his own interests and capabilities, evaluate labour market offers and build an individual trajectory for entering an attractive profession.	2) The student correlates the labour market offers with his ideas about the professional future, building an individual trajectory to achieve the desired goal.	11) I explore the professions that interest me and highlight the qualities I need to develop.
	3) The student demonstrates the ability to present himself to the employer (CV, interviews, etc.).	12) At the lessons, we learn how to write a resume, have interviews and present ourselves to the employer.

Descriptors of the 4<sup>th</sup> unit, competencies No. 1 (Table 6).

1. The learner uses existing information resources and personal relationships to evaluate labour market offers.
2. The student correlates the labour market offers with his ideas about the professional future, building an individual trajectory to achieve the desired goal.
3. The student demonstrates the ability to present himself to the employer (CV, interviews, etc.).

Markers indicate how these descriptors work

from the student's point of view and, accordingly, these indicators are the basis for the grading system. By and large, these indicators are some questions. Questions allow us by the students' answers to evaluate some of the data obtained on the condition of various parts of the process. This brings forth the technology of managing the process of advancing professional training based on the data. We can see that for each of these units, there are various numbers for us to judge which unit is acceptable and has "sags".

Based on the survey data, the following results were obtained (Table 7)

Table 7.

The Results of the Study

Statements	Percentage of respondents choosing a certain score				
	(1)	(2)	(3)	(4)	(5)
When doing homework, the teacher allows me to consider my own professional plans for the future.	47%	42%	10%	0%	0%
During my answer in the lesson, the teacher always asks me to clarify what value the new knowledge or mastered action has for me personally.	29%	20%	50%	0%	0%
The teacher often asks us to independently come up with and complete a task on the topic covered.	88%	10%	2%	0%	0%
Each of the students periodically prepares and delivers a report on the prospects for the development of the studied profession and the position within the profession he can personally practice.	95%	2%	3%	0%	0%
We often team up with other students during classes and fantasize about what professions will be like in the future.	0%	2%	63%	35%	0%
Theoretically and practically, getting acquainted with various technologies, we determine which professions are associated with them and whether we can find our profession in this area.	0%	8%	29%	63%	0%
If any profession attracts me, then I try to get detailed information about it and understand what I personally lack in order to take the appropriate position.	5%	30%	58%	7%	0%
When doing a practical task, I always try to understand whether I can do it professionally in the future and why.	5%	32%	34%	24%	6%



When doing practical actions, I always fantasize about how it could be in the future.	11%	5%	62%	18%	4%
We conduct educational research, identifying labour market needs in the most like professions.	81%	13%	3%	3%	0%
I explore the professions that interest me and highlight the qualities I need to develop.	50%	3%	20%	16%	11%
We learn how to write a resume, have interviews, and present ourselves to the employer in the lessons.	98%	0%	2%	0%	0%
The teacher gives everyone the same tasks, each having the correct answer.	6%	28%	9%	12%	45%
We never talk about what this or that profession will look like in the future.	0%	0%	22%	28%	50%
I rarely think about my future profession, imagining it only in general terms.	0%	5%	22%	54%	20%

From the results obtained, we see that most schoolchildren have answered the questions from the “Individualization of technological education” unit that this unit is not clearly visible in technological education. It is worth noting that the questions were focused on the individualization of education based on the professional orientation of the educational process, and these results show that there is no clearly defined orientation to the individual professional interests of students in the learning tasks.

Regarding the unit “Professionalization of meta-subject competencies”, we see that children note an average tendency to professionalise these competencies, just like with the unit of *basic professional actions*. This shows that in the formation of meta-subject competencies, schoolchildren often emphasize students’ professional prospects.

The unit of *orientation in the world of professions and employment* has a negative assessment, too.

### Discussion

Scientists from around the world research to prepare students for professional activities. The following trends have been identified, and the opinions of most authors agree on this: advanced professional training should be started from school; priority is given to self-education and the development of a mentoring system.

As a result of the research by Turkish scientists İ. Dökme., A. Açıksöz & Z. Koyunlu

Ünlü it was found that the motivation of students to pursue STEM did not differ depending on the level of education, the type of secondary school they graduated from, or family income. However, motivation for STEM fields differed based on the variables “receiving STEM training”, “participating in STEM activities”, and “having (or not having) a role model working in the STEM field”. It can be concluded that advanced vocational training should start from school. It does not matter what school you study in. The family’s social status is not important, nor is the family’s income. It is necessary to pay attention to what kind of training you are undergoing in advanced professional training, to participate and complete the necessary developmental tasks actively and have a mentor (Dökme, Açıksöz, & Ünlü, 2022).

Interest in the development of such skills as teamwork, oral communication, and written communication can also be traced to the works by American scientists N. Chinoy, H. Stoub, Y. Ogrodzinski. Thus, American scientists have studied the formation of these competencies among students of biomedical sciences at the University of Michigan. From this, we can conclude that these competencies need to be developed beginning with school years for successful professional training (Chinoy et al., 2022).

Russian scientists D. P. Danilaev and N. N. Malivanov (2020) write in their study that technological education presented as a factor and

means of socialization of students, as well as “the process and result of the active assimilation by schoolchildren of general and professional technological culture, general and special methods of technological transformation” has undergone significant changes over the past decade: today, in a high-tech competitive world, priority is given to the ability to self-learning and the ability to advanced professional training (p. 55).

As history has shown, the economy and industry development have made people turn to school each time. Understanding that if we have suffered significant losses, for example, during the war, then the next young generation is presented by schoolchildren. Pre-professional training has been already carried out there so that most school graduates have gone to factories or mastered a profession in the evening. To date, there is a trend of rapid preparation of graduates. On September 1, 2022, the Ministry of Education of Russia’s “Professionalism” (QR-code) program will start, within the framework of which about 150 thousand students of secondary vocational educational institutions will start studying. Instead of four years, children will master the curriculum in two years. Since the educational process, for the most part, will be practice-oriented and better linked with the employer, it is planned to maintain the quality of education corresponding to four years of study in secondary vocational education.

It looks like the history with the bachelor’s degree is going to repeat. When they introduced the bachelor’s degree, they said that the quality would not suffer, we would simply concentrate, and we would do everything so that the quality of education in the speciality would not fall. The same knowledge that used to be given in five years would be given in four years. We have all seen that a specialist degree is valued higher than a bachelor’s degree in practice. To go to graduate school, a bachelor must complete a master’s degree.

Moreover, those who have graduated from the speciality can immediately go to graduate school. The same will happen with professional-

ism. The diploma of graduates will not be equal to what they receive in the SVE. It will be a level down, and employers will keep that in mind.

Obviously, the economy needs a new workforce; to increase its number and wants to employ young people as soon as possible. Therefore, it is necessary to acquaint schoolchildren with the world of the profession quickly, somehow set them up to the fact that they do not need to study at all in the 10<sup>th</sup> or 11<sup>th</sup> grades in order to take place in this adult world, that in two years after the 9<sup>th</sup>-grade one can acquire a profession, which will help to gain success somewhere. Furthermore, advanced professional training becomes an interesting issue, not fashionable, but quite relevant.

The Ministry of Education proposes to halve the list of professions and specialities in colleges. According to the First Deputy Minister of Education of Russia Dmitry Glushko, not a single skill and not a single competence will be lost. In our opinion, the reduction in the number of professions is intended not to bind a graduate to a particular profession. They want to make sure that a college graduate with a diploma has the opportunity to get a job in many places. “The Ministry of Education plans to change the state educational standard (FSSES) and make it more framework and “broad”, reducing the list of professions and specialities in colleges by half and enlarging the groups of professions. According to Dmitry Glushko, they plan to leave one document for a whole group of professions, which as a result will make it possible to quickly respond to the requirements of the economy and promptly adjust educational programs” (RIA News, 2021).

There is a need to organize the content of technological education so that the minimum content gives the maximum effect and allows one to obtain the necessary competencies to master a large number of professions of the present and future.

## Conclusion

According to the regulatory documents and

the strategy for the development of technological education, we can say that there is a significant reformation of education and technological education at present. Particular attention is paid to the need to restructure the content and means of education, taking into account the dynamically changing situation in society's technological, economic, and professional spheres.

We have singled out four units so that by their maturity, one can judge the degree of orientation of the educational process at school towards the professional training of students.

The results of a survey of schoolchildren have revealed that the most developed unit of advanced professional training is the formation of meta-subject competencies, taking into account the professional orientation of the student. This is explained by the fact that meta-subject competencies are the basis for further professional training of schoolchildren at the level of higher and secondary specialized education. That is why the formation of meta-subject competencies at school focuses on the professional activities of students.

Similarly, with meta-subject competencies, average indicators are observed in the assimilation of labour skills. This trend is due to the fact that when mastering new material, emphasis is placed on the actual application of the acquired knowledge in professional activities, which is designed to increase the motivation of students but is not the goal of preparing children for professional activities or part of career guidance.

It should be noted that the individualization of education is not so focused on taking into account the professional preferences of students. This is due to the fact that most schoolchildren do not yet have a clear-cut judgment on professional preferences. The second reason for the weak orientation of the individualization of education towards a professional orientation is that in most cases, individualization is understood as taking into account individual characteristics associated with current interests and not with interests aimed at the professional sphere, which students will face only in a few years and which are

not such a strong motivation today.

Another weakly expressed unit in the modern school among students is orientation in the professional sphere. This is due to the fact that most students do not yet think about their future professional activities. Also, these indicators could be affected by the fact that the peculiarities of the professional sphere are most often introduced in institutions that provide vocational training and not general education institutions.

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#### References

- Azimov, E. G., & Shchukin, A. N. (2009). *Novyy slovar' metodicheskikh terminov i ponyatiy* (New Dictionary of Methodological Terms and Concepts, in Russian). Moscow: IKAR Publishing House. Retrieved May 25, 2021, from [http://linguistics-online.narod.ru/olderfiles/1/azimov\\_e\\_g\\_shukin\\_a\\_n\\_novyy\\_slovar-21338.pdf](http://linguistics-online.narod.ru/olderfiles/1/azimov_e_g_shukin_a_n_novyy_slovar-21338.pdf)
- Bim-Bad, B. M. (1988). Advanced education: Theory and practice. *Modern Pedagogy*, 6, 51-55. Retrieved May 28, 2021, from [http://www.bim-bad.ru/biblioteka/article\\_full.php?aid=1038](http://www.bim-bad.ru/biblioteka/article_full.php?aid=1038)
- Bochkareva, T. N., Akhmetshin, E. M., Zekiy, A. O., Moiseev, A. V., Belomestnova, M. E., Savelyeva, I. A., & Aleynikova, O. S. (2020). The analysis of using active learning technology in institutions of secondary vocational education. *International Journal of Instruction*, 13(3), 371-386. doi:10.29333/iji.2020.13-326a
- Chinoy, N., Stoub, H., Ogrodzinski, Y., Smith, K., Bahal, D. & Zubek, J. (2022). Assessing student desire for professional

- skills development within the undergraduate science curriculum: A focus on teamwork. *Advances in Physiology Education*, 46(1), 179-189. doi:10.1152/advan.00051.2021
- Craps, S., Pinxten, M., Knipprath, H., & Langie, G. (2020). Exploring congruency between engineering students' professional role preference, competences and career choice. In B. V. Nagy, M. Murphy, H.-M. Jarvinen, A. Kalman (Eds.), *Proceedings of the SEFI 47<sup>th</sup> Annual Conference: Varietas Delectat... Complexity is the New Normality* (pp. 1506-1518). Budapest, CA: European Society for Engineering Education (SEFI).
- Dahl, V. I. (1998). *Explanatory dictionary of the living Great Russian language*. Moscow: Citadel. <https://search.rsl.ru/ru/record/01000841106>
- Danilaev, D. P., & Malivanov, N. N. (2020). *Tekhnologicheskoe obrazovanie i inzhenernaya pedagogika* (Technological education and engineering pedagogy, in Russian). *Obrazovanie i Nauka (Education and Science, in Russian)*, 22(3), 55-82. doi:10.17853/1994-5639-2020-3-55-82
- Dökme, İ., Açıksöz, A., & Koyunlu Ünlü, Z. (2022). Investigation of STEM fields motivation among female students in science education colleges. *International Journal of STEM Education*, 9(1) doi:10.1186/s40594-022-00326-2
- Fung, M., Taal, R., & Sim, W. (2021). SkillsFuture: The roles of public and private sectors in developing a learning society in Singapore. In Ra. S. Jagannathan, S. Maclean, R. (Eds.), *Powering a learning society during an age of disruption. Education in the Asia-Pacific region: Issues, concerns and prospects* (Vol. 58, pp. 195-208). Singapore: Springer. [https://doi.org/10.1007/978-981-16-0983-1\\_14](https://doi.org/10.1007/978-981-16-0983-1_14)
- Husain, F. M., & Mahfoodh, O. H. A. (2021). English for professionals students' perceptions of the relevance of internship to their undergraduate courses and career choices. *Higher Education, Skills and Work-Based Learning*, 11(5), 1068-1088. doi:10.1108/HESWBL-02-2020-0020
- Jüttler, A., Schumann, S., Neuenschwander, M. P., & Hofmann, J. (2021). General or vocational education? The role of vocational interests in educational decisions at the end of compulsory school in Switzerland. *Vocations and Learning*, 14(1), 115-145. doi:10.1007/s12186-020-09256-y
- Kabakus, A. T., & Senturk, A. (2020). An analysis of the professional preferences and choices of computer engineering students. *Computer Applications in Engineering Education*, 28(4), 994-1006. doi:10.1002/cae.22279
- Kamaeva, R., Zemsh, M., Gilmanshina, S., & Galich, T. (2021). Učinak modela razvoja vodstva na meku vještinu vodstva srednjoškola (The effect of the leadership development model on high school students' leadership as a soft skill, in Croatian). *Croatian Journal of Education*, 23(3), 877-902. doi:10.15516/cje.v23i3.4151
- Knipprath, H. (2013). Long-term effects of grade retention and downward track changes on educational degree, participation in lifelong learning and occupational career. *Pedagogische Studien*, 90(5), 74-88.
- Koncepciya prepodavaniya predmetnoi oblasti "Tekhnologiya" v obrazovatel'nykh organizatsiyakh Rossiiskoi Federacii, realizuyushchikh osnovnye obshcheobrazovatel'nye programmy (The concept of teaching the subject area "Technology" in educational institutions of the Russian Federation, implementing the main general education programs, in Russian) (2018, December 12). Re-

- trieved May 25, 2021, from. <https://docs.edu.gov.ru/document/c4d7feb359d9563f114aea8106c9a2aa/>
- Marx, K., & Engels F. (1960). *Sochineniya* (Essays, in Russian) (2<sup>nd</sup> ed.). Moscow: Politizdat. <https://www.marxists.org/russkij/marx/cw/t23.pdf>
- Mikhailov, A., Tikhonov, A. & Margarov, G. (2022). The value potential of an engineer in a high-tech environment and digitalization of the economy. *WISDOM*, 21(1), 86-92. <https://doi.org/10.24231/wisdom.v21i1.611>.
- Moiseev, V. V., Pastukh, T. A., Nitsevich, V. F., & Stroeve, V. V. (2021). Human capital Russian elite and efficiency public administration. *Smart Innovation, Systems and Technologies*, 227, 227-237. doi:10.1007/978-981-16-0953-4\_22
- Moon, H., & Hong, S. (2022). The multiple mediating effects of Korean workers' perception of the fourth industrial revolution, career attitudes and future learning intent. *European Journal of Training and Development*. doi:10.1108/EJTD-06-2021-0073
- Novikov, A. M. (2000). *Russian education in a new era*. Moscow: Egves. <http://anovikov.ru/books/ros.pdf>
- Novikov, A. M. (2002). *Ideya operezhayushchego obrazovaniya* (The idea of advancing education, in Russian). *Mir obrazovaniya – obrazovanie v mire* (The World of Education is Education in the World, in Russian), 3, 171-197. <https://elibrary.ru/item.asp?id=30746148>
- Ozhegov, S. I. (2010). *Tolkovyj slovar' russkogo yazyka: 80 000 slov i frazeologicheskikh vyrazhenij na russkom yazyke* (Explanatory dictionary of the Russian language: 80,000 words and phraseological expressions, in Russian). Moscow: A TEMP LLC.
- Primernaya osnovnaya obrazovatel'naya programma osnovnogo obshchego obrazovaniya* (Approximate basic educational program of basic general education, in Russian) (2015). *Spravochnaya pravovaya sistema "Konsul'tant Phylus"* (Consultant Plus Legal reference system, in Russian). Retrieved May 25, 2021, from [http://www.consultant.ru/document/cons\\_doc\\_LAW\\_282455/](http://www.consultant.ru/document/cons_doc_LAW_282455/)
- Ria novosti* (RIA News) (2021). *Minprosveshcheniya vdvoe sokratit kolichestvo special'nostej v kolledzhah* (The Ministry of Education will halve the number of specialties in colleges, in Russian). Retrieved May 25, 2021 from <https://ria.ru/20210301/kolledzhi-1599501776.html>
- Sedov, S., & Kashfrazyeva, G. (2022). The trends in the development of technological education and advanced vocational training of students in the context of technological education. *World Journal on Educational Technology*, 14(1), 200-216. <https://doi.org/10.18844/wjet.v14i1.6718>
- Tikhonov, A. I., & Novikov, S. V. (2020). Modern Organization Effective Functioning Evaluation. *Quality-Access to Success*, 21(178), 3-6.
- Tsakissiris, J., & Grant-Smith, D. (2021). The influence of professional identity and self-interest in shaping career choices in the emerging ICT workforce. *International Journal of Work-Integrated Learning*, 22(1), 1-15.
- Vishnyakova, S. M. (1999). *Professional'noe obrazovanie: Slovar': Klyuchevye ponyatiya, aktual'naya leksika* (Professional education: Dictionary. Key concepts, terms, current vocabulary, in Russian). Moscow: Scientific Methodological Center for Secondary Vocational Education. Retrieved from <https://search.rsl.ru/ru/record/01000607696>
- Vorontsova, Yu., Arakelyan, A., & Baranov, V. (2020). Smart technologies: unique opportunities or the global challenges of



transhumanism. *WISDOM* 15(2), 68-75. doi:10.24234/wisdom.v15i2.335  
Vygotsky, L. S. (1982). *Problemy obshchej psichologii* (Problems of general psycholo-

gy, in Russian). Moscow: Pedagogy. Retrieved May 20, 2021 from <https://www.marxists.org/russkij/vygotsky/cw/pdf/vol2.pdf>