

Management of Teacher Scientific-Methodical Work in Vocational Educational Institutions on the Basis of Project -Target Approach

Elena A. Shakuto^a, Evgenij M. Dorozhkin^a and Anastasia A. Kozlova^a

^aRussian State Vocational Pedagogical University, Ekaterinburg, RUSSIA

ABSTRACT

The relevance of the subject under analysis is determined by the lack of theoretical development of the problem of management of teacher scientific-methodical work in vocational educational institutions based upon innovative approaches in the framework of project paradigm. The purpose of the article is to develop and test a science-based structural-functional model of management of teacher scientific-methodical work on the basis of project-target approach. The primary method of study is modeling, which allows to consider the problem as a process of purposeful obtaining skills by teachers of secondary vocational educational institutions to conduct scientific-methodical work on the basis of project-target approach. The article presents a structural-functional model of management of teacher scientific-methodical work. The model comprises a series of components: target, methodological, content, organizational and procedural, evaluation-resultative. The article also suggests a complex of organizational-pedagogical conditions for management of teacher scientific-methodical work on the basis of project-target approach: developing and organizing a management system of teacher scientific-methodical work; building a purposeful teachers' motivation for scientific-methodical work in the context of changing socio-economic conditions; organizing a system of teachers' professional development in the field of scientific-methodical work on the basis of project-target approach. The content of the article can be used by Heads of vocational educational organizations, Deputy heads who control methodical work in educational organizations, heads of teacher training programs, as well as college and university teachers in their training students of higher and secondary vocational education.

KEYWORDS

Methodical work, project-target approach, scientific-methodical competence of a teacher, scientific-methodical work

ARTICLE HISTORY

Received 14 March 2016
Revised 28 May 2016
Accepted 19 June 2016

Introduction

In the context of new socio-economic conditions teachers of vocational education are to be competitive and possess such basic competencies that would

CORRESPONDENCE Elena A. Shakuto ✉ elenashakuto@e1.ru

© 2016 Shakuto, Dorozhkin and Kozlova. Open Access terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>) apply. The license permits unrestricted use, distribution, and reproduction in any medium, on the condition that users give exact credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if they made any changes.

promote the development of Russian vocational education raising its prestige on a global level. In this regard creating a science-based structural-functional model of management of teacher scientific-methodical work on the basis of project-target approach appears to be up-to-date (Zagvyazinsky, Plotnikov & Volosnikova, 2013; Khuziakhmetov & Gabdrakhmanova, 2016 a,b; Simonova et al., 2016).

The problem assumes a special importance due to the implementation of Federal state educational standards. At the present stage of development and modernization of vocational education in Russia the vocational school is passing from the knowledge (gnostic) approach over to a new one – project-target approach. Modern goal-setting suggests that knowledge, which used to be a primary goal of any education is now considered to be a means of personal development. This proves the efficiency of the project-target approach to the management of teacher scientific and methodical work (Druzhinin, 2011; Lizinskiy, 2005; Davydova et al., 2016).

In the structure of scientific-methodical competence of a teacher we distinguish personal, activity-based and cognitive components. The personal component reflects the characteristics of emotional, volitional and motivational spheres of a teacher's activity (Dorozhkin & Zeer, 2014). The personal component comprises knowledge, skills, and abilities that refer to the psychological aspect of the teacher personality structure. In the present study the personal component is presented by communicative, reflexive, and perceptual knowledge, skills, and abilities.

The project-target approach to the management of teacher scientific-methodical work in educational institutions stands for a complex of conceptual ideas that ensure achieving specific targets in the process of implementing the project-based method, aimed at raising the level of teachers' knowledge, skills, socio-professional competencies, and professionally relevant qualities (Il'yenko, 2003). This approach is a universal method, and to be even more specific, is an integration of social and informational, research and prognostic principles. Thus we may conclude that it is the base of the XXI century educational paradigm.

The structural-functional model of management of teacher scientific-methodical work is based on the integration of project-target, systemic, activity-based, axiological approaches to organizing the process of increasing the level of knowledge, skills, and professionally relevant qualities, building motivation, developing professional reflexion and educational mobility, which are important components of scientific-methodical competence of a teacher.

Scientific-methodical work in a secondary vocational institution is represented by two types of teachers' activity: educational-methodical work and scientific research. Educational-methodical work is the basis for organizing teaching process in a vocational educational institution. It comprises development and implementation of basic professional educational programs, academic disciplines work programs, interdisciplinary courses, and modules on the basis of project-target approach (Saenko, 2007). Teachers' research activity is conducted in two directions: the first one is their own research work; the second one is guidance of students' learning and research work.

The management of teacher scientific-methodical work on the basis of project-target approach ensures the organization of a project-based process in accordance with a specific target; allows to coordinate the actions of the



administration and teaching staff of a vocational educational institution; promotes a more efficient resolution of strategic issues (Makarova, 2003).

Therefore creating organizational-pedagogical conditions, providing efficient management of teacher scientific and methodical work in vocational educational institutions is now of particular importance (Litkens, 2006).

Materials and Methods

Methods of study

There have been used the following methods of study: theoretical methods – conceptual and terminological analysis of the research basic points; analysis of pedagogical, psychological, science-methodological literature, norm documents; modelling: empirical methods – observation, questioning, conversation, monitoring; method of expert evaluation; static methods – analysis, synthesis, collected data processing.

Experimental base of study

The experimental research base was the state educational institutions of secondary vocational education – “Sverdlovsk regional pedagogical college”, “Sverdlovsk regional musical-aesthetic pedagogical college”, and “Sverdlovsk vocational pedagogical college”.

Stages of study

The research included three stages. At the first stage we analyzed philosophic, psychology-pedagogical, scientific-methodological literature, and theses; interpreted theoretical and methodological principles of management in scientific-methodical work on the basis of project-target approach; formulated terminology base, working hypothesis; research objectives; developed the model of management of teacher scientific-methodical work; defined the structure of the model and the content of its components; the conditions, making its functioning possible; specified the sequence and content of the experimental procedure. We also developed the method of realization of the model and the program of teacher training in vocational educational organizations.

At the second stage we specified the hypothesis and the terminology base of the study, the subject of study; conducted ascertaining, forming, and control stages of implementing the model of management of teacher scientific-methodical work, and the teacher training program; assessed the efficiency of organization-pedagogical conditions.

At the third stage we analyzed and summarized the outcomes of the experimental work; defined the sequence of presenting the material of the research; specified the theoretical and practical conclusions; registered the obtained results.

Results

The structure and content of the model

Designing a structural-functional model and its content was carried out in accordance with the conceptual ideas of the project-target, systemic, activity-based and axiological approaches. The model of management of teacher scientific-methodical work in vocational educational institutions is based on the

interrelation of project-target, systemic, activity-based, axiological approaches, which reveal the mechanism of raising the level of teachers' knowledge, skills, and professionally important qualities, which are all the elements of their competence.

The study defines the constituent components of the structural-functional model of management of teacher scientific-methodical work. They are target-based, methodological, content, organizational and procedural, evaluation-resultative (Figure 1).

The target component of the model reveals the target and complex of objectives that provide a systematical increase of teachers' knowledge and skills in scientific-methodical work that form their scientific-methodical competence; promote the implementation of innovative scientific-methodical developments.

The methodological component of the model reflects the principles of project-target approach to teacher scientific and methodical work. They are project-based, openness, creativity, science-based, consistency, efficiency, and interaction principles.

The content component of the model reveals the basic functions of management: planning, motivation building, work organizing and control (Gladik, 2008). The organizational and procedural component of the model discloses the subject of activity, which predetermines teacher scientific and methodical work. The evaluation-resultative component of the model consists of three blocks: motivation-axiological, cognitive- activity, and professionally-reflexive. It demonstrates the expected, final results of scientific-methodical competence development and management efficiency of teacher scientific-methodical work.

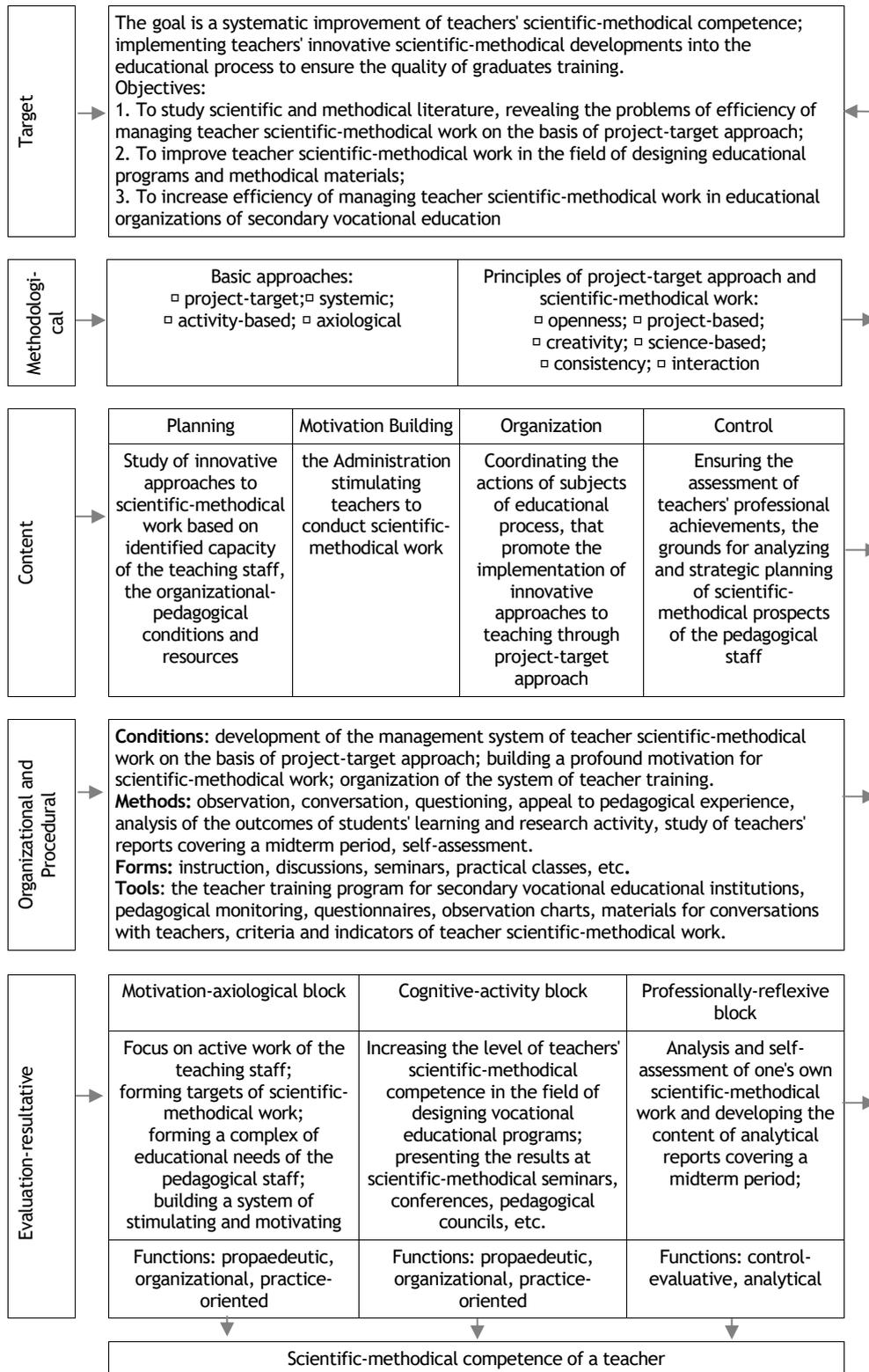


Figure 1. Structural-functional model of management of teacher scientific-methodical work in vocational educational institutions

Organization of the method of a structural-functional model that provides teachers' professional development

The process of organizing the method of a structural-functional model that provides teachers' professional development in terms of raising the level of knowledge, skills, professionally important qualities in the context of a professional training program for teachers, working in secondary vocational institutions in the city of Ekaterinburg – comprised three stages: propaedeutic, activity-based, outcome-correction.

At the propaedeutic stage we defined the targets, objectives, methods of data collection, the evaluation criteria of teachers scientific and methodical work, forms of work with the teaching staff, a set of tools for pedagogical monitoring; the primary evaluation according to the stated criteria was provided.

At the activity-based stage we introduced the content of the structural-functional model of management of teacher scientific-methodical work on the basis of project-target approach; the teachers took an active part in the teacher training program; the monitoring of the teachers' knowledge, skills, and professionally relevant qualities was conducted.

The main goal of the outcome-correction stage of the method was analyzing and correcting the components of the structural-functional model. The obtained monitoring data were analyzed with a subsequent foresight; the teachers' knowledge and skills in scientific-methodical work, acquired by them during the course were consolidated. We also corrected indicators of knowledge and skills, the content of the teacher training program, organizational forms, scientific-methodical work objectives, monitoring tools, etc.

Organizational-pedagogical conditions for managing teacher scientific-methodical work

Organizational-pedagogical conditions provide efficient teacher scientific-methodical work on the basis of project-target approach.

The first condition was developing and implementing the management system of teacher scientific-methodical work in vocational educational institutions on the basis of project-target approach. When introducing it we took into account the following points: improving efficiency of scientific-methodical work is achieved through the systematic management of this process on the basis of structural-functional model; implementing the principles of structural-functional model of management (openness, science-based, project-based, creativity, consistency, efficiency, interaction) provides a clear direct communication and feedback among all performers of the educational process.

The second condition was building a profound motivation of teachers for scientific-methodical work. When introducing the second condition we discovered and eliminated the factor of teachers' dissatisfaction in this type of activity. That was their inner psychological reasons: uncertainty and difficulties in developing the content and forms of control in academic disciplines programs; doubts while selecting diagnostic materials aimed at identifying achievements of their own and those of students; uncertainty when choosing innovative forms of organization of educational and extracurricular student activities, as well as pedagogical technologies ensuring the quality of federal state educational



standards implementation; the decrease of motivation for scientific-methodical work, which leads to a change in the level of knowledge, skills, professional reflexion, pedagogical mobility, personality orientation, self-esteem. This factor helped to assist the teachers in their planning individual educational vector of self-development and contributed to the building of positive motivation for scientific-methodical work.

The third condition was organizing a system of teacher training program in scientific-methodical work on the basis of project-target approach. When introducing that condition a complex of events was arranged – in order to increase the level of knowledge and skills, to build motivation, personality orientation, professional reflexion, pedagogical mobility, which are the constituent components of teachers' scientific-methodical competence (Maslennikova et al., 2012; Dorozhkin et al., 2016). The identified criteria will allow teachers to properly build a vector of their own professional self-realization (Biryukova, 2016).

The management of teachers' scientific-methodical work in vocational educational institutions on the basis of project-target approach is an innovative trend in solving important objectives of the federal state educational standards of secondary vocational education, in achieving educational goals through detailed study of the problem, intention, pedagogical situation with a real, practical result prepared for introducing into the educational process of the vocational education system (Mukhamedzyanova & Shaikhutdinova, 2012).

The results of experimental work on implementation of organizational-pedagogical conditions for the management of teacher scientific-methodical work on the basis of project-target approach in educational institutions of secondary vocational education

The ascertaining stage

In order to confirm the theoretical points of study and verify the results of the introduced structural-functional model experimental work was carried out to be one of the most reliable methods of pedagogical research.

The aim of the ascertaining stage is analyzing the real state of the management system of scientific-methodical work in vocational educational organizations; assessing the level of knowledge, skills, professional reflexion, self-esteem, personality orientation of the teachers conducting scientific-methodical work.

Scientific-methodical work is seen as a dynamically developing system, which can be efficient only under certain organizational-pedagogical conditions. The organizational-pedagogical conditions are understood as a combination of measures and events that provide an efficient management of teacher scientific-methodical work.

The complex of organizational-pedagogical conditions includes the management system of teacher scientific-methodical work in vocational educational institutions; purposeful motivation of teachers for scientific-methodical work; stimulating teachers to processes of self-development, self-improvement through the inclusion of mechanisms of self-realization in scientific-methodical work in an educational institution; a complex of events aimed at raising teachers' qualification, the level of knowledge, skills,

professional and personal qualities, such as professional reflexion, educational mobility, professional orientation.

When defining the complex of organizational-pedagogical conditions, we took into consideration peculiar properties and facilities of a specific educational organization, the requirements of the federal state educational standard for secondary vocational education, essential features of the project-target, axiological, systemic and activity-based approaches to managing teacher scientific and methodical work.

Based on theoretical analysis of scientific-pedagogical and methodical literature, the empirical data of the ascertaining stage of experimental work, we selected indicators and identified diagnostic methods for a complex assessment of teachers' personal qualities development. Those qualities make up scientific-methodical competence, reflecting the personality structure of a teacher engaged in scientific-methodical work (Table 1).

Table 1. The components and indicators of teachers' scientific and methodical competence and diagnostic methods for its assessment

No	Components	Indicators	Methods
1	Motivation-axiological	Personality orientation, teachers' motivation for scientific-methodical work	"Motivation of professional activity" by C. Zamfir (1983), translated by A.A. Rean (2006)
2	Cognitive-activity	Knowledge and skills in scientific-methodical work	Expert assessment on the basis of a questionnaire. Assessment of the level of personal qualities development by E.F Zeer (2003)
3	Professional-reflexive	Self-assessment, professional reflexion, educational mobility	Expert assessment on the basis of a questionnaire. Methods for diagnostics of reflexion level by A.V. Karpov (2003). Express diagnostics of self-esteem level by N.P. Fetiskin, V.V. Kozlov & G.M. Manuilov (2002)

In addition, at the ascertaining stage, we found out that 57% of teachers had a high self-esteem, 18% of teachers had an adequate self-esteem, and 25% had a low self-esteem.

The forming stage

The pedagogical conditions implementation at the forming stage required an active participation of teachers from Sverdlovsk regional pedagogical College. The effectiveness of the organizational-pedagogical conditions for managing teacher scientific-methodical work was verified on the basis of 4 levels: the cognitive, the reproductive, the transfer, and the creative one.

At the forming stage of the study we discovered that 42 % of the teachers belong to the cognitive (first) level, 30 % – to the reproductive (second) one, 24 % – to the transfer (third) level, and 4% - to the creative (fourth) level.

Together with the information-methodical center we developed and introduced a training program for Deputy Heads and teachers of educational institutions of secondary vocational education. The goal of the program was



methodological and technological training of Deputy heads, specialists of methodical service of the educational institution in managing teacher scientific-methodical work, which is to ensure the modernization of the content of secondary vocational education.

The training program was to motivate teachers to work in particular vocational educational organizations and pedagogical groups. The obligatory element at the end of each training lesson was professional reflexion: the audience analyzed their activity during the entire training day.

The recommended educational methods are interactive technologies, brainstorming, discussion-seminars, round tables, business games, conferences (Figure 2).

Scientific-research work		Teaching-methodical work	
↓		↓	
Group consultations; seminars; demonstration conferences; round table	practice-oriented individual consultations; scientific-research lessons; conferences	Group consultations; conferences; trainings; creative groups of a young teacher; scientific-methodical committee meetings	scientific-research personal development meetings; school scientific-methodical committee meetings

Figure 2. Organizational forms of scientific-methodical work

Various forms of interaction that were used during the course allowed the participants to exchange pedagogical and managing experience, discuss their own vision of recent trends in scientific-methodical work in educational organizations of secondary vocational education. The results obtained at the end of the forming stage were evaluated by the experts. It let us compare them to the teachers' self-esteem, systematize and analyze the dynamics of change in the level of knowledge, skills after the implementation of the model and conducting the training program. The processing of experimental work results was carried out by means of MS Excel spreadsheets and STATISTICA V. 6.0. software.

The evaluation-resultative stage

At this stage of the experiment to define the development of knowledge, skills, professional reflexion, personality orientation (Table 2), and self-esteem, an evaluation procedure was provided. The same methods were used as at the ascertaining stage. The presented materials showed essential changes in all the criteria.

Table 2. Teachers' predominant orientation type at the ascertaining and forming stages

№	Predominant orientation type	Ascertaining stage		Forming stage	
		Control and experimental group (%)		Control group (%)	Experimental group (%)
1	Objective orientation	24%		24%	44%
2	Interaction orientation	21%		21%	37%
3	Self-orientation	55%		55%	19%

At the ascertaining stage 57 % of the teachers had a high self-esteem, 18 % had an adequate self-esteem, and 25 % - a low self-esteem. Within the forming stage during the teacher training program in the experimental group 58 % of the teachers reached an adequate self-esteem, and only 13 % of the teachers still possessed a low self-esteem. The results of the control group remained the same.

Essential changes occurred in the cognitive sphere of the teachers. The level of knowledge and skills increased significantly after systematizing knowledge and ideas of scientific-methodical work and its importance in an educational organization. Most of the teachers exhibited a great deal of interest while mastering new approaches to the organization of scientific-methodical work and developing tools for its improvement. We also found out problems, preventing teachers from successful scientific-methodical work in an educational organization of secondary vocational education. Among them are uncertainty and difficulties while selecting the content of work programs of academic disciplines and professional modules; doubt when choosing diagnostic materials, aimed at identifying achievements of their own and those of the students in their scientific-research and learning-research activity; uncertainty when choosing innovative forms of organization of educational process, pedagogical technologies, ensuring the quality of educational programs implementation. All the abovementioned problems lead to a decrease of the level of knowledge and skills, change of motivation, professional reflexion, pedagogical mobility, teachers' personality orientation and self-esteem.

At the control stage of the experiment we identified the changes and compared them to the results of the ascertaining stage. The experimental group outcomes appeared to be relevant, while the control group outcomes remained unchanged.

The outcomes analysis shows that the introduced teacher training program provides positive results according to all the criteria. Therefore, implementing the structural-functional model of managing teachers' scientific-methodical work on the basis of project-target approach ensures achieving a specific target and positively affects teachers' self-realization in scientific-methodical work.

Discussions

Developing teachers' readiness to conduct scientific-methodical activity is discussed in detail in the works of V.M. Lizinskiy (2001), O.E. Saenko (2007). The essence and structure of teacher scientific-methodical work, approaches to its design and planning, modern tools of monitoring its results, organizational conditions are studied in the works of I.A. Lebedeva & V.S. Kolbas (1992); T.N. Makarova (2003); V.A. Fedorov, A.V. Stepanov & T.M. Stepanova (2015); N.K. Chapaev (2016).

The basic approach to managing teacher scientific-methodical work in vocational educational institutions is a project-target approach. The latter is seen as a complex of conceptual ideas, which ensure achieving specific goals while implementing the project-based method, promote the increase of teachers' knowledge and skills, their socio-professional competencies and professionally relevant qualities (Ibragimov, 2012; 2014).

The review of psychological, pedagogical, and methodical literature allows to state that today there are no special studies devoted to the problem of



managing teachers' scientific-methodical work on the basis of project-target approach in educational institutions of secondary vocational education.

Conclusion

The present study is dedicated to the development and implementation of the structural-functional model of managing teacher science-methodical work into the educational process of a specific educational organization. The model is based upon the project-target approach integrated with the axiological, systemic and activity-based approaches. The model reveals the mechanism of developing teachers' scientific-methodical competence and professionally relevant qualities with subsequent self-realization in scientific-methodical work.

The materials of the article can be used by Heads and Deputy heads for managerial decision-making when organizing teachers' traineeships and refresher courses, in professional students training in the system of higher and secondary vocational education, as well as for solving various practical issues occurring in teachers' scientific-methodical work in educational institutions of various types and kinds.

In the course of the study there appeared new questions to be analyzed. Further research can be associated with the study and development of other innovative approaches in the framework of the project paradigm dedicated to the organization of teacher scientific-methodical work in secondary vocational educational institutions.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Elena A. Shakuto is Head of College of Electroenergy and Machinebuilding of Russian State Vocational Pedagogical University, Ekaterinburg, Russia.

Evgenij M. Dorozhkin is PhD, Professor, Rector of Russian State Vocational Pedagogical University, Ekaterinburg, Russia.

Anastasia A. Kozlova is student of Russian State Vocational Pedagogical University, Ekaterinburg, Russia.

References

- Biryukova, N. A. (2016). Assessment of the adult's personal development as an indicator of the quality of further education. *The Education and science journal*, 6, 141-151. DOI:10.17853/1994-5639-2016-6-141-151
- Chapaev, N. K. (2016). Activity-based principle implementation in the methodological concept of N. E. Jerganova. *The Education and science journal*, 7, 26-39. DOI:10.17853/1994-5639-2016-7-26-39
- Davydova, N.N., Dorozhkin, E.M., Fedorov, V.A. & Konovalova, M.E. (2016). Research and Educational Network: Development Management. *IEJME-Mathematics Education*, 11(7), 2651-2665.
- Dorozhkin, E. M. & Zeer, E. F. (2014). Methodology of professional pedagogical education: theory and practice (theoretical and methodological foundations of vocational teacher education). *The Education and science journal*, 9, 4-20. DOI:10.17853/1994-5639-2014-9-4-20
- Dorozhkin, E. M., Leontyeva, T. V., Scherbina, E. Y., Shchetynina, A. V. & Pecherskaya, E. P. (2016). Teacher's Labour as a Tool of Forming Human Capital of Higher School Graduates. *IEJME-Mathematics Education*, 11(7), 2773-2787.
- Druzhinin, V. I. (2011). *Methodical work in an educational institution*. Kurgan: IROST, 138 p.

- Fedorov, V. A., Stepanov, A. V. & Stepanova, T. M. (2015). Composite pedagogical staff-clusters as a condition of department educational and methodical work development. *The Education and science journal*, 9, 36-50. DOI:10.17853/1994-5639-2015-9-36-50.
- Fetiskin, N. P., Kozlov, V. V. & Manuilov, G. M. (2002). *Socio-psychological diagnostics of personality development in small groups*. Moscow: Publishing house of Psychiatry institute, 490 p.
- Gladik, N. V. (2008). *Internal school management of scientific-methodical work*. Moscow: Izdatel'stvo 5-go znaniya, 445 p.
- Ibragimov, G. I. (2012). *The conception of didactic teacher training*. Kazan: Publishing house "Danis", IPPO RAO, 36 p.
- Ibragimov, G. I. (2014). Methodological problems of higher school didactics. *The Education and science journal*, 6, 3-19. DOI:10.17853/1994-5639-2014-6-3-19
- Il'yenko, L. P. (2003). *Theory and practice of methodical work management in educational institutions*. Moscow: ARKTI, 168 p.
- Karpov, A. V. (2003). Reflexion as a psychic attribute and methods of its diagnostics. *Psychological Journal*, 24(5), 45–57.
- Khuziakhmetov, A.N. & Gabdrakhmanova, R.G. (2016a). Creativity in Joint Activity of Teacher and Student in the Learning Process. *IEJME-Mathematics Education*, 11(4), 735-745.
- Khuziakhmetov, A.N. & Gabdrakhmanova, R.G. (2016b). Creativity in Joint Activity of Teacher and Student in the Learning Process. *IEJME-Mathematics Education*, 11(4), 735-745.
- Lebedeva, I. A. & Kolbas, B. S. (1992). *The Administration activity aimed at developing creative personality of a teacher (from experience)*. Perm: Orion, 15 p.
- Litkens, K. Ya. (2006). *Organization of teacher scientific-methodical work in Gymnasium № 1541 of the western district of the city of Moscow*. Direct access: http://pages.marsu.ru/iac/educat/nauka/_private/metod2.html.
- Lizinskiy, V. M. (2005). *About methodical work at school*. Moscow: Publishing house "Kryl'ya", 160 p.
- Makarova, T. N. (2003). *Planning and organization of methodical work at school*. Moscow: Centre "Pedagogicheskii poisk", 160 p.
- Maslennikova, V. Sh., Ugarova, N. M., Shamsutdinova, V. R. & Fisina, T. A. (2012). The strategy of innovative development in vocational education and upbringing. *Kazan Pedagogical Journal*, 4(94), 91-101.
- Mukhamedzyanova, F. Sh. & Shaichutdinova, G. A. (2012). Innovative principles of teacher training in vocational education. *Kazan Pedagogical Journal*, 1, 25-35.
- Rean, A. A. (2006). *Psychology and psychodiagnostics of personality: theory, research methods, practicum*. Saint-Petersburg: Praim-EVROZNAK, 265 p.
- Saenko, O. E. (2007). *Organization and content of methodical work in a secondary educational institution*. Moscow: Izdatel'stvo "Dashkov i Co", 384 p.
- Simonova, M.V., Ilyukhina, L.A., Romantsev, G.M., Zeer, E.F. & Khamaturov, F.T. (2016). Approaches to Monitoring of Competences and Qualifications. *IEJME-Mathematics Education*, 11(7), 2745-2760.
- Zagvyazinsky, V. I., Plotnikov, L. D. & Volosnikova, L. M. (2013). Pedagogic Education in Russia and Its Potential Development Strategy. *The Education and science journal*, 4, 3-18. DOI:10.17853/1994-5639-2013-4-3-18
- Zamfir, C. (1983). *Un sociolog despre: munca si satisfactie*. Moscow: Politizdat, 140 p.
- Zeer, E. F. (2003). *Profession psychology*. Ekaterinburg: Delovaya kniga, 336 p.