



Forming A Pedagogue's Research Competences in Innovative Educational Environment

Tatyana Yuryevna Tsibizova¹, Nikolay Gennadievich Poyarkov¹, Svetlana Viktorovna Mamaeva², Alexander Vladimirovich Rubtsov², Elena Mefodyevna Plekhanova³, Vera Viktorovna Kolchina⁴, Iryna Nikolaevna Tonkavich⁵

¹Bauman Moscow State Technical University (National Research University), Moscow, Russia

²Lesosibirsk Pedagogical University – affiliated branch of Siberian Federal University, Lesosibirsk, Russia

³Krasnoyarsk State Pedagogical University named after V.P. Astafiev, Krasnoyarsk, Russia

⁴Ural State University of Railway Transport, Ekaterinburg, Russia

⁵Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus

Abstract

Introduction. Changes that take place in different spheres of life in Russia (economic, political, social, cultural) determine new requirements to the goals, values, functions of education in providing the development and self-realization of students. A graduate of a modern school should master a complex of information and research skills, and have critical and creative thinking. **Research methodology.** The orientation of education towards the growth of a student as a person, bearer of certain individual peculiarities, and activity subject may be of use only if an effective strategy of pedagogic work is developed. Such a strategy should be scientifically grounded on the basic principles of modern approaches implemented in pedagogy and psychology: humanistic, personality-, activity- and competence-oriented. *Research results.* Four spheres of a pedagogue's professional activity in an innovative educational environment have been distinguished: sphere of analysis, synthesis and mastering pioneering pedagogic experience; sphere of popularization and initial practical use of pioneering pedagogic experience and advanced developments; sphere of the improvement of professional skills and realization of creative potential of a teacher; sphere of innovative processes in the system of education. *Discussion.* The essence of a pedagogue's research activity is conditioned by the functions, which are based on the following factors: optimization of the teaching and educational process; specifically, structured controlled cognitive process; processes of self-improvement, self-instruction and self-education, self-realization; mastering professional pedagogic activity of a new level. *Conclusion.* Four levels of the development of a teacher's research competences have been distinguished: basic, empiric (local and initiative), productive (tactical), and constructive (strategic).

Keywords: Pedagogue's Research Activity; Teacher's Research Competences; Technology of Research Activity Improvement; Problematization; Module.

1. Introduction

Changes that take place in different spheres of life in Russia (economic, political, social, cultural) determine new requirements to the goals, values, functions of education in providing the development and self-realization of students. A graduate of a modern school should master a complex of information and research skills, and have critical and creative thinking. The Council of Europe makes the same demands, distinguishing five groups of key competences, including social, intercultural, of written and oral communication, information and research, life-long learning. The Federal law "On the education in the Russian Federation", National doctrine on education, Concept of Modernization of Russian Education until 2020, State programme of the Russian Federation "The development of education (2013-2020)", Professional standard "Pedagogue", and other normative documents set a teacher new tasks in increasing the quality of the educational process corresponding to the constantly rising requirements of a person and the society to the system of education.

The idea of education development laid in normative documents on education is realized by teachers within the innovative activity,

which purposefully influence the changes of content, means and methods of the educational process and is closely interrelated with its research activity. Therefore, the research component of a teacher's pedagogic activity influencing the development of both professional competence of a teacher, and a new practice of education, brings to light the need for a higher level of a teacher's research competences development.

In our study, *research competences* of a pedagogue are considered as dynamic professional and personal characteristics. They have a complex structure, components of which are aimed at implementing the functions of pedagogic research activity; have integrative nature; are directed toward self-realization and self-development of a teacher in pedagogic activity; and focused on searching for knowledge required to solve educational problems of a certain general education institution in accordance with the goals of modern education.

2. Methods

The orientation of education towards the growth of a student as a person, bearer of certain individual peculiarities, and activity subject may be of use only if an effective strategy of pedagogic

work is developed. Such a strategy should be scientifically grounded on the basic principles of modern approaches implemented in pedagogy and psychology: humanistic, personality-, activity- and competence-oriented. Thus, challenges set for a school teacher are to form and carry out the educational strategy that promotes the most successful self-determination of students in various situations (not necessarily educational ones); effective application of methods of intellectual, physical and moral self-improvement, control of personal emotions; qualitative mastering of knowledge, skills and abilities related to the setting of goals, working of the plan of action, reflex analysis and assessment of the process and results, independent search for and study of the necessary information, degree of information awareness and involvement in the system of universal values; development of teamwork skills. A pedagogue of a modern school should be able to provide flexible education based on the individual approach, form competences necessary for the innovative development of the state, maximize students' creative potential, and instil one of the most significant skills – skill of independent work. A schoolteacher should know how to use such methods of structuring the educational process that greatly surpass the traditional methods in different ways. The specific character of professional activity of a school pedagogue is in its multifunctional nature, the presence of several varieties of localized activity in it that intertwine at different stages of the educational process. That idea is reflected in the works of many authors. For example, N. V. Kuzmina defines the following elements as parts of a teacher's professional activity structure: communicative, gnostic, organizational, constructive [1]. According to A. I. Shherbakov, organizational component combines four functions: developing, informational, mobilizing, and orientational [2]. Moreover, the author pays special attention to a research function. Considering the work of a school pedagogue under the approach that highlights the role of creative work and individual manifestations, V. A. Kan-Kalik believes that the work of a teacher consists of over two hundred aspects [3]. V. P. Tarantej thinks that any sort of a pedagogue's professional activity can be attributed to one of six categories: educational, communicative, research, organizational and methodological, administrative, and special [4]. Based on a humanitarian educational paradigm encouraging forming of subject-object relations between a teacher and pupil, L. M. Mitina divides a pedagogue's professional activity into three pairs of constituents: goals and tasks of the pedagogical process, means and methods of their solution, study and assessment of an employee's actions [5]. According to A. I. Zhuk and N. N. Koshel, the transformation of target and value components of the educational system determines the fundamental change of not only the essence of the educational process but also the role of a school pedagogue in it. The authors point out that the structure of pedagogical work is determined by different functions that a teacher performs within "teacher-pupil" cooperation and distinguish four elements of this structure: pedagogical (including organizational and administrative constituents), research, methodical, and technological and planning [6]. In general, pedagogues and psychologists have different views on the components of a teacher's professional activity, but all authors agree that research work is one of its main parts. In our opinion, research work is a core decisive element of the professional activity of a schoolteacher, «bridge» between theory and practice. We consider a pedagogue's research activity (hereinafter referred to as PRA) to be a type of activity focused on improving theoretical and practical aspects of education that involves carrying out researches by a pedagogue to reveal and overcome certain difficulties and get new information about the means allowing to achieve the desired results. The specific character of PRA lies in the applied nature of ongoing research work (its orientation at solving the problem emerging and progressing in a certain educational institution); emphasis on increasing the quality and effectiveness of the educational process [7]. Carrying out research and taking into account the problems of

an educational institution, a teacher has an opportunity to analyse the current situation, interpret it in line with a certain scientific concept, and find an optimal or just acceptable way to address it.

3. Results

In different periods of the twenty-first century, PRA was associated with supporting different processes and functions characteristic for the professional activity of a school pedagogue. The functions of PRA have constantly been reviewed with regard to a continuous updating of tasks due to the development of education in the context of social and economic changes. As a result of an analysis of scientific literature [8-12], we distinguish four spheres of a pedagogue's professional activity within which PRA (as a constituent of pedagogic activity) takes the most important place, is carried out and evolves most actively: 1) sphere of analysis, synthesis and mastering pioneering pedagogic experience; 2) sphere of popularization and initial practical use of pioneering pedagogic experience and advanced developments; 3) sphere of the improvement of professional skills and realization of the creative potential of a teacher; 4) sphere of innovative processes in the system of education. The analysis of these spheres in the professional practice of a school pedagogue allowed distinguishing the following functional complexes associated with the above-mentioned spheres and representing the essence of PRA. The first complex of functions (informational, diagnostic, analytical, reflexive, optimizing, compensatory) is «responsible» for maximizing the educational opportunities, revealing the profound relationship between the stages of ongoing processes, between previous and current states. Thus, research activity should be considered as a pedagogical tool that helps to analyse and adjust the problems that emerge during other types of the professional activity of a pedagogue, as a result influencing the level of their effectiveness. The second complex of functions (scientific and methodological, planning, predictive, administrative, constructive) is built on the first complex and based on a specifically structured controlled cognitive process which consists of identifying a problem, forming and verifying hypotheses, working out and carrying out an experiment, analysing the received data. In this context, research activity serves as a key integrating element for other types of a pedagogue's professional activity, being built on them, and increasing their effectiveness. The third complex includes functions of self-perfection, self-conditioning and self-education, self-realization and unleashing of personal and professional potential. Many authors (T. G. Brazhe, N. V. Kuzmina, L. S. Podymova and others) emphasize that schoolteachers' self-consciousness significantly increases when they are involved in research activity. M. M. Levina also points out the great influence of such activity on forming pedagogic mastery and direction of personal development [13]. According to V. I. Mareev and G. P. Shhedrovickij, the activity related to science encourages the development of constructive self-concept of a pedagogue [14]. The authors agree that a comprehension of personal and professional experience, its analysis and synthesis bring an element of creativity to the pedagogical work, give it a special subjective significance. Within the research work, a schoolteacher reveals the main content of an urgent professional problem and identifies the most prospective ways of its solution during a retrospective or preliminary analysis aimed at forming a personal attitude towards the problem and willingness to constantly self-improve in the chosen profession. The fourth complex of functions consists of functions directly related to the development of education. Being a structural part of a modern pedagogue's professional activity, research constituent determines the evolution of both a teacher's work and the educational practice in general. The requirements of the society to the state system of education are constantly increasing which encourages schoolteachers to use new methods and technologies, search for their optimal

combination in the context of a particular lesson. In our opinion, the innovative activity of a pedagogue in the research sphere should be aimed at identifying and analysing not only a relevant educational demand but also a demand that may present itself in the foreseeable future.

4. Discussion

The essence of PRA in the modern socio-professional environment is conditioned by the functions, which are based on the following factors [15]:

- optimization of the teaching and educational process and successful addressing of tactical challenges;
- specifically structured controlled cognitive process consisting of identifying a problem, forming and verifying hypotheses, working out and carrying out an experiment, analysing the received data;
- processes of self-perfection, self-conditioning and self-education, self-realization and unleashing of personal and professional potential;
- mastering professional pedagogic activity of a new level aimed at structuring the educational process in accordance with a clear scientifically sound strategy.

From our point of view, only a pedagogue who has certain research competences can carry out these functions. Authors of pedagogical works do not have a common view on defining the term "competence". We believe that it is related to the complexity of its structure, which includes characteristics of KAS (knowledge, abilities, skills), methods of activities implementation, as well as a description of certain personality features allowing a person to achieve acceptable results in the chosen field. In order to characterize the concept of "a teacher's research competences" (TRC) most accurately, basic differences between two related concepts – "competence" and "competency" – should be determined. According to the explanatory dictionary edited by D. N. Ushakov, competency is "awareness, authority", and competence is "a range of questions, phenomena in which this person has authority, knowledge, experience; terms of reference" [16]. A. V. Hutorskoj and L. N. Hutorskaja think that competency should be described as the presence of relevant competences manifesting themselves, in particular, in the personal attitude of an employee towards the activity in general and its purpose [17]. The authors define competences as a combination of interdependent personality traits (knowledge, skills, abilities, methods) applied to a number of processes and phenomena and necessary for using the latter as an external foundation of an effective activity. Competency, in its turn, is interpreted as a degree of professional experience realization peculiar to this individual, within the competences relevant to the chosen profession. At a certain point, a high level of competency involves a symbiosis of different competences: social (of legal culture, civic literacy), intellectual (ability to analyse the situation, its critical understanding), and personal (communicative skills and the ability to analyse personal behaviour, readiness for life-long learning). The performed analysis allows interpreting competence as a combination of specific normative functions and characteristics, stated and officially approved applied standard, and competency as an achieved and put into practice combination of personal traits and gained professional experience in the chosen field. In this context, we consider TRC as integral attributes of a professional and personal kind that determine the requirements imposed on carrying out the functions of PRA: informational, diagnostic, reflexive, analytical, constructive, planning, predictive, personal, administrative, and others. In our opinion, the reflexive function is the main research function in a schoolteacher's work. Apart from achieving pedagogical goals (overcoming an unfavourable situation without wasting time, efforts, etc., obtaining optimal learning outcomes, improving the emotional state of students), it helps to fulfil a number of research tasks: to identify the reason of

a problem, argue the chosen way of solving it, determine prospective scenarios to increase the comfort of the educational process. PRA depends on the transition from the practice supporting reflexion to the specialization and subject analysis of this reflexion, and then to its transformation into "a system of activities called a scientific research" [18]. TRC are developing characteristics of a professional and personal type with a complex structure, elements of which are aimed at carrying out the functions of PRA; they are integrated categories that encourage a teacher to professionally self-improve, constantly search for new information necessary for overcoming the difficulties that a certain educational institution faces in the light of the challenges posed by the current reality. The analysis of the structure of TRC listed in the works of different researches allowed our colleagues to divide the discussed constituents into three groups of competences [19]:

- related to value, goal and motivation aspects, as well as to a pedagogue's personal traits significantly contributing to PRA;
- based on the theoretical knowledge required for quality research work in the chosen profession;
- determining skills and abilities necessary for PRA. Hence, the component structure of TRC includes three interrelated groups. We decided to call them motivational and purposeful, theoretical and informative, and organizational and activity-based;
- in accordance with the performed functions. The motivational and purposeful group of TRC is a mandatory subjective condition for PRA that determines a schoolteacher's personal attitude towards a scientific constituent of work and depends on psychological traits of an employee and the desire to self-improve and unleash the personal potential in research activity.

The theoretical and informative group of TRC provides the cornerstone of all pedagogical competences, as it is of direct relevance to concepts and terminology of the respective field of science. The knowledge of theory and methodology is another factor that allows assessing the level of TRC. According to our received data, this criterion recognizes the degree of understanding of basic scientific and methodological concepts, knowledge of logic and stages of pedagogical research, insight into new theories and conceptions actively used by practising teachers and pedagogues-psychologists.

The organizational and activity-based group of TRC is related to the level of proficiency in the combination of skills and abilities required for the effective structuring of research activity and its subsequent implementation. The factors contributing to the fulfilment of the necessary requirements should include the following [20]:

- goal-setting, in which the research goals inseparable from the global educational goals are formed, tasks of pedagogical and research nature are set, content and prospects of the new system of education are analysed;
- diagnostics, necessary for training and educating, identifying new facts, carrying out the monitoring of PRA and the assessment of its results;
- communication, that allows engaging with colleagues and pupils; to build a constructive and trusting relationship with the children both in class and during extracurricular activities, since communication as any other activity is the area of self-presentation and «self-creation» of a person. Thus, the ability to establish a high-quality communication becomes a condition for an effective diagnostics of pedagogical work, ensures the purity of the ongoing experiment, and, consequently, allows finding more efficient ways of solving the problem;
- decision-making, consisting in choosing one option out of a number of others. There are two possible scenarios: in the first case, a schoolteacher makes a choice between the already available sets of behaviour; in the second case, a schoolteacher "invents" a way out of the current situation using personal experience and creative resources. The specific character of a teacher's decision-making lies in the complex activity of

analytical nature focused on addressing the uncertainty of the current situation.

5. Conclusion

We distinguished four levels of TRC development: basic, empiric (local and initiative), productive (tactical), and constructive (strategic). The basic level of mastering the discussed competences manifests itself in a selective and unstable interest of a pedagogue in research work with the prevalence of extrinsic motivation. The empiric level of mastering TRC is represented by the availability of stable values of research work, awareness of the need to hone professional skills. Besides the above-mentioned peculiarities, the productive level of TRC mastering is characterized by a high level of planning skills development. The constructive level of TRC is related to the awareness and expressed wish to carry out research activity; ability to suggest a personal interpretation of a problem; in-depth analysis of processes and results of the work; high level of the realization of predictive and planning potential.

References

- [1] Wang S, Gorbunova NV, Masalimova AR, Bírová J, Sergeeva MG (2017), Formation of Academic Mobility of Future Foreign Language Teachers by Means of Media Education Technologies, *Eurasia Journal of Mathematics, Science and Technology Education*, 14(3), 959–976.
- [2] Milovanov KYu, Nikitina EYe, Sokolova NL, Sergeeva MG (2017), The creative potential of museum pedagogy within the modern society, *Espacios*, 38(40), 27–37.
- [3] Sergeeva MG, Bedenko NN, Karavanova LZh, Tsbizova TYu, Samokhin IS, Anwar MSM (2018), «Educational company» (Technology): Peculiarities of its implementation in the system of professional education, *Espacios*, 39(2), 24.
- [4] Mikhcheva NF (2016), Il Firsova's readings: On the international conference "Contemporary Philology and Methodology of Foreign Language Teaching: Basic Tendencies and Development Prospects". Moscow, April 26–27, 2016, *Vestnik rossiiskogo universiteta druzhby narodov seriya Lingvistika – Russian Journal of Linguistics [Proceedings of Peoples' Friendship University of Russia, Section "Linguistics" – Russian Journal of Linguistics]*, 20, (2), 149–151.
- [5] Tatarinceva AM, Sergeeva MG, Dmitrichenkova SV, Chauzova VA, Andryushchenko IS, Shaleeva EF (2018), Lifelong learning of gifted and talented students, *Espacios*, 39(2), 29.
- [6] Samokhin IS, Sergeeva MG, Tabuyeva EV, Stanchulyak TG, Kolesina EG (2018), Assessment of student's potential based on the data concerning productivity and psychological comfort of education, *Espacios*, 39(2), 22.
- [7] Sergeeva MG, Bondarenko NG, Shebzuhova TA, Vartumyan AA, Lesnikova SL (2018), Scientific substantiation of the conception of continuous economic education development, *The Turkish Online Journal of Design, Art and Communication (TOJDAC)*, Special Edition, 178–185. (DOI NO: 10.7456/1080MSE/122)
- [8] Ju R, Buldakova NV, Sorokoumova SN, Sergeeva MG, Galushkin AA, Soloviev AA, Kryukova NI (2017), Foresight methods in pedagogical design of university learning environment, *Eurasia Journal of Mathematics, Science and Technology Education*, 13(8), 5281–5293. DOI: 10.12973/eurasia.2017.01003a
- [9] Mukhin MI, Mishatkina MV, Sokolova NL (2017), On the issue of institutional and methodological foundations of teacher's training, International conference "Education environment for the Information Age (EEIA 2017)", *European Proceedings of Social and Behavioural Sciences*, 28, 457–465.
- [10] Sergeeva MG, Nikitina EE (2016), Criteria indicators of formation of economic competence of system of the general education // International Conference "Education Environment for the Information Age" (EEIA-2016), Moscow, Russia, June 6–7, 2016. S.V. Ivanova and E.V. Nikulchev (Eds.). <http://dx.doi.org/10.1051/shsconf/20162901064>
- [11] Sergeeva MG, Komarovskaya EP, Bakhtigulova LB, Tabuyeva EV, Kalashnikov PF, Galyuk AD (2018), «Educational company»: Peculiarities of the technology's implementation at different educational levels when forming the economic competencies of future specialists, *Espacios*, 39(2), 25.
- [12] Sukhodimtseva AP, Sergeeva MG, Donskaya MV, Kupriyanova ME, Tomashevich SB (2018), Metadisciplinarity in education: Solving actual problems, *Espacios*, 39(2), 27.
- [13] Neverkovich SD, Bubnova IS, Kosarenko NN, Sakhieva RG, Sizova ZhM, Zakharova VL, Sergeeva MG (2018), Students' Internet Addiction: Study and Prevention, *Eurasia Journal of Mathematics, Science and Technology Education*, 14(4), 1483–1495.
- [14] Tatarinceva AM, Sokolova NL, Mrachenko EA, Sergeeva MG, Samokhin IS (2018), Factors determining individual success in Life-long learning, *Espacios*, 39(2), 28.
- [15] Tatarinceva AM, Sokolova NL, Sergeeva MG, Bedenko NN, Samokhin IS (2018), The influence of a psychological and a cognitive component of a student's thinking style on his/her success in lifelong learning, *Espacios*. V. 39. N 2. P. 30.
- [16] Sergeeva MG, Sinelnikov IYu, Sukhodimtseva AP (2017), Metasubject abilities development in upper secondary school students as a pedagogical problem, *The European Proceedings of Social & Behavioural Sciences EpsBS*, 531–539.
- [17] Mikhcheva NF, Popova EA, Ignashina ZN (2017), Teaching Latin-American Spanish in Russia: communication difficulties approach, *11th International Technology, Education and Development Conference*. Valencia, Spain, 6th-8th March, INTED Proceedings, 3526-3534.
- [18] Sergeeva MG, Flyagina VYu, Taranenko IV, Krasnova EV, VilkoVA AV (2017), The interaction of labor market and educational services market considering social partnership mechanism and specificity of the regional educational policy, *Ponte*, 73(12), 2.
- [19] Sergeeva MG, Sokolova NL, Ippolitova NV, Tabuyeva EV, Ilyinskaya IP, Bakhtigulova LB (2018), Psychological and pedagogical support for the social worker's professional development, *Espacios*, 39(2), 26.
- [20] Sergeeva MG, Ippolitova NV, Solovyeva AV, Petrova LA, Kunytsina ML, Andryushchenko IS (2018), Verification of management support of the professional and educational trajectory of students in the sociocultural educational environment of the University, *Espacios*, 39(2), 23.