



Copyright © 2019 by Academic Publishing House Researcher s.r.o.
All rights reserved.
Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2019, 8(1): 144-156
DOI: 10.13187/ejced.2019.1.144
www.ejournal1.com

WARNING! Article copyright. Copying, reproduction, distribution, republication (in whole or in part), or otherwise commercial use of the violation of the author(s) rights will be pursued on the basis of international legislation. Using the hyperlinks to the article is not considered a violation of copyright.



Modernization of Regional Continuing Pedagogical Education in the «School-College-Institute»

Roman S. Nagovitsyn ^{a, *}, Dana K. Bartosh ^b, Aleksandr Y. Ratsimor ^c, Nataliya V. Neverova ^d

^a Glazov State Pedagogical Institute, Russian Federation

^b Pushkin State Russian Language Institute, Russian Federation

^c State Social and Humanitarian University, Russian Federation

^d Moscow Aviation Institute (National Research University), Russian Federation

Abstract

The development of a strategy for continuous pedagogical education in the aspect of professional training of students in the direction of “Pedagogical education” contributes to solving the problem of lack of teaching staff in the region, including young graduates. The implementation of this technology involves a wide synergistic interaction of higher education institutions, pedagogical colleges and secondary educational institutions. In this regard, the goal of the research is to develop a structural model for the modernization of regional continuing pedagogical education in the school-college-university system and experimentally prove its effectiveness in the implementation of teacher education in the region. The structural model developed in the study includes synergistically interconnected blocks: regulatory and legislative, targeted, theoretical, methodological, technological, and resulting. The study involved various budget organizations (n = 50) and the pedagogical institute (n = 1) of the Udmurt Republic. The implementation in practice of the model showed its effectiveness at each link in the holistic system of the educational route of the region: from schoolchild to young specialist. The increase in the number of applicants for pedagogical training profiles, the increase in students' motivation from the first to the fifth year to the future professional activity, as well as the directly proportional reduction in the lack of young specialists in this area in the region consistently proves the effectiveness of the study and the need to continue it.

Keywords: system model, continuous pedagogical education, school-college-institute, region, modernization, motivation.

* Corresponding author

E-mail addresses: gto18@mail.ru (R.S. Nagovitsyn), bartosch@inbox.ru (D.K. Bartosh), ralexstupino@gmail.com (A.Y. Ratsimor), neverova.nw@yandex.ru (N.V. Neverova)

1. Introduction

Teachers are one of the most popular professions: in the USA there are about 3.4 million primary and secondary school teachers, and in Russia there are almost 1.5 million. Many scientific and sociological works are devoted to the problem of preparing for the most popular profession in Russia and abroad. The studies emphasize that the system of training teachers cannot be built only on the selection of gifted students, it is necessary to learn how to prepare future teachers for professional activities. In this regard, the improvement of the educational system cannot be carried out without the system modernization of teacher education (Sidorkin, 2013). Pedagogical education determines the quality of professional training in all areas of the functioning of society and the state. The implementation of the Bologna and Turin processes in all organizations of secondary vocational and higher education most urgently put forward the task of increasing the competition of educational organizations and the education system as a whole at the regional, federal and international level.

In 2013-2014, according to the results of a sociological survey, it was found that in our country the proportion of teachers over 50 years old (almost 40 %) is significantly higher than the average for other countries participating in the survey. The outflow from the profession of qualified and active young teachers seems to have influenced the age structure of this professional group in post-Soviet Russia (Maslinsky, Ivanyushina, 2016).

In turn, the increase in requirements for teaching staff and the need for pedagogical universities to meet federal target indicators of the effectiveness of educational institutions of higher education, in terms of increasing the number of graduates who are employed in the teaching space, determined the need to develop new professional trajectories based on cluster technologies (Aydarova, 2016). In this regard, the need for the implementation of continuing professional education (Eremenko, 2014; Kurdenkova, 2014; Aleksandrov et al., 2015; Vinogradov et al., 2015; Fedorov, Sedykh, 2015; Yakovleva, 2015; Pushkareva, 2016; Miles et al., 2016; Park et al., 2016; Iwakuni, 2017; Asadullin 2017; Cherednichenko, 2017; Nagovitsyn et al., 2018, etc.) in creating a system of strategic partnership, including the interaction of secondary schools, pedagogical colleges, teacher training institutions, employers and local government authorities and management.

The development of a strategy for continuous pedagogical education in the aspect of professional training of students in the direction of “Pedagogical education” contributes to solving the problem of lack of teaching staff in the region, including young graduates. The implementation of this technology involves a wide synergistic interaction of higher education institutions, pedagogical colleges and secondary educational institutions. The most common model of cooperation is the school-college-university educational cluster model. The need to find new approaches to increasing and further attracting young teachers, educators and teachers to educational activities in various organizations is dictated by key areas stated: in the “Law on Education” in the context of article 46, in the “Professional Standard of Teacher” in the aspect of part 1 on teacher qualification characteristics, in the “Concept of the Federal Target Program for the Development of Education for 2016–2020”, in the “Concept for the Long-Term Socio-Economic Development of Russia of the Russian Federation for the period up to 2020”, in the “Strategy of the innovative development of the Russian Federation for the period up to 2020”, in the State Program of the Russian Federation “Development of Education” for 2013-2020, in the “National Doctrine of Education of the Russian Federation” (2000-2025), in the “Comprehensive Program for the Improvement of the Professional Level of Teachers of General Education Organizations” for 2013-2020.

A detailed analysis of domestic and foreign studies on the research problem revealed the multidimensionality of key decisions on the analyzed topics in the system “student-entrant-student-graduate-young teacher. A number of authors sharply raise issues of improving career guidance activities as the main factor in the system for increasing the quantity and quality of teaching staff (Schleicher, 2011; Bignold, Barbera, 2012; Kasprzhak, 2013; Margolis, 2015; Nagovitsyn et al., 2018, etc.), including a system for upgrading the admission campaign system to pedagogical profiles (Alasheev et al., 2016; Zhuk, 2016; Floden et al., 2017, etc.).

The main task of researchers is most often to justify the ways and possibilities to enhance the training of teachers in continuous systems “college-university” and “school-university” (Volodina et al., 2017; Yuzhaninova, 2014; McMahon et al., 2013; Zeichner, 2012 ; Sobolev, 2016; Miles et al.,

2016; Park et al., 2016; Iwakuni, 2017; West, Saine, 2017; Li, 2018, etc.). Also, a number of researchers propose the implementation of the modernization of gradual introduction of graduates of pedagogical profiles into independent professional activities (Trent, 2012; Pereira, 2013; Ovcharov, Lopatkin, 2015; Fedorov, Sedykh, 2015; Zagvyazinsky, 2016; Maslinsky, Ivanyushina, 2016; Pinskaya et al., 2016; Rijswijk et al., 2016; Adnot et al., 2017; Gafurov et al., 2018, etc.). Particularly noteworthy are the works published abroad and aimed at finding ways to solve the reduction in the quantity and quality of teaching staff observed in Russia (Sabirova, 2014; Sobolev, 2016; Ismagilov et al., 2017).

The analysis and synthesis of various approaches to the modernization of continuing pedagogical education identified in the study, the search for new models for the implementation of teacher training made it possible to identify the key contradiction (Nagovitsyn et al., 2017). Between a thoroughly developed regulatory and theoretical and methodological framework for the modernization of pedagogical education and the inadequate systematic study of each stage of the regional system of continuous professional education of a teacher: a graduate student, a graduate student and a young teacher. In this regard, the goal of the research is to develop a structural model for the modernization of regional continuing pedagogical education in the school-college-university system and experimentally prove its effectiveness in the implementation of teacher education in the region.

2. Materials and methods

The study involved ($n = 50$) municipal budgetary secondary general education institutions, youth sports schools and institutions of supplementary education in all districts of the Udmurt Republic (focus-organizations). And the only pedagogical educational institution of the Udmurt Republic, which prepares bachelors of pedagogical education – Glazov State Pedagogical Institute. V.G. Korolenko (focus institute). Focus organizations were selected for the experiment based on the availability of information for the study and the presence of working graduates of the focus-institute.

Experimental work was carried out from 2015 to 2018 based on the analysis of the scientific literature, the collection of official information, sociological and comparative methods, questionnaires, interviews, analysis and formulation of the relevant conclusions. For a quantitative analysis of the data obtained in the course of research, the T-test was used at ($p=0.01$, $p=0.05$).

For a sociological analysis, indicators were used in the clusters “student-applicant-student” and “student-young teacher”. For the first cluster, the following criteria were used to identify the percentage:

- applications for admission to the focus-institute from applicants from focus organizations of the total number of applications filed by them;
- incoming applicants to the focus-institute of focus organizations from the total number of entrants received;
- students of 1-2 courses of the focus-institute, who do not want to work according to the profession being taught, of the total number of students of 1-2 courses;
- students of 4-5 courses of the focus-institute who do not want to work in the profession being taught, of the total number of students of 4-5 courses.

For the second cluster, the following criteria were used to identify the percentage:

- the employed graduates of the focus-institute are not in the profile of training or not employed at all from the total number of graduates of this year (military service and a decree are not included);
- free pedagogical vacancies in focus organizations of the total number of pedagogical rates in focus organizations;
- young specialists of focus organizations leaving the profession in the first 3 years after starting work from the total number of teachers in focus organizations;
- young specialists up to 25 years of the total number of working teachers in focus organizations.

For a theoretical research work, we analyzed publications in leading domestic and foreign scientific journals that are part of the Web of Science or Scopus international citation systems for the past 5 years. The national journal selection includes: “European Journal of Contemporary Education”, “Pedagogy”, “Voprosy obrazovaniya”, “Russian Education & Society”, “Integration of

Education”, “Novosibirsk State Pedagogical University Bulletin”, “Teoriya i praktika fizicheskoy kul'tury”, “Psychological science and education”. Magazines of the largest publishers were included in the foreign sample: Elsevier Science Publishing Company, Springer Science-Business Media, John Wiley & Sons, Inc., SAGE Publishing and Taylor & Francis Group.

The structural model of modernization of regional continuing pedagogical education in the school-college-university system developed in the study offers the author's view on the improvement of teacher training in the region by level: student-entrant, student-student and young teacher (Figure 1).

Regulatory support of the process of continuous professional training of teachers							
Law on Education	Professional standard of a teacher	Concept of the Federal Target Program for Education Development for 2016–2020	Concept of Long-Term Socio-Economic Development of the Russian Federation for the Period up to 2020.	Strategy of Innovative Development of the Russian Federation for the Period up to 2020.	State Program of the Russian Federation «Development of Education» for 2013–2020	National Doctrine of Education of the Russian Federation (2000–2025).	A comprehensive program to improve the professional level of teachers in general education organizations for 2013–2020.
The right to engage in teaching activities are persons who have secondary vocational or higher education and meet the qualification requirements specified in the qualification reference books, and (or) professional standards	The teacher must have a higher education; Teachers with secondary special education and currently working in pre-school organizations and elementary school should be given the conditions for obtaining it without separation from their professional activities	Implementation of pilot projects for the modernization of regional vocational education systems and the optimization of vocational education programs, support for the development of associations of educational institutions of vocational education (cluster type) on the basis of universities	Realization of the strategic goal of the state policy in the field of education to increase the availability of quality through the creation of a modern system of continuous education, training and retraining of professional personnel	Development of regional innovation development strategies through building up human resources in science, education, technology and innovation, which, in turn, should be ensured by the creation of a continuing education system	Updating the composition and competencies of teaching staff, creating mechanisms for motivating teachers to improve the quality of work and continuous professional development	Establishes the priority of education in public policy, through the creation of conditions for the steady increase in the prestige and social status of teachers and educators, and the implementation of continuity of levels and levels of education	Increase the prestige of the profession and modernization of pedagogical education, focused on the introduction of models of network interaction of educational organizations, conducting long-term practices, including ensuring the implementation of individual educational trajectories for students who already have secondary vocational or higher education

Regulatory block

Purpose:
Reducing the shortage of teaching staff in organizations of educational, additional, preschool, physical education, sports, creative areas of the region and the care of young teachers from the profession without increasing budget funding and material social investments

Tasks			
Implementation of the network programs of additional education "Young teacher" and teaching classes	Creation of continuous vocational guidance activities of schoolchildren and students for further employment as a teacher, starting from the middle level of the school and ending with the magistracy and postgraduate studies	Improving the continuous training program "Targeted training"	Improving the social status of the future and the young teacher

Target block

Cluster steps of the system of continuous professional education of a teacher						
Schoolboy – enrollee		Enrollee – student		Student – young teacher		
The main directions of theoretical and methodical research on the analysis leading domestic and foreign educational journals						
Improving career guidance activities of potential students of pedagogical profile	Modernization of the admissions campaign system for pedagogical profiles	New approaches to the implementation of teacher training in continuous systems:		Search for ways to address the decline in the quantity and quality of teaching staff observed in the national education system (based on foreign experience)		Development of a system of long-term internship as the final stage of training, postgraduate support, or the creation of specialized "pedagogical residencies"
		"School-university"	"College-university"	Russian studies	Foreign studies	
Schleicher, 2011; Bignold, 2012; Barbera, 2012; Kasprzhak, 2013; Margolis, 2015; Borisenkov, 2015; Zemtsov, 2015; Yeremkin, 2015; Barinova, 2015; Terentyev, 2015; Gruzdev, 2015; Gorbunova, 2015; Aydarova, 2016; Beetle, 2016; Avralev, 2017; Efimova, 2017; Makoveychuk, 2017; Chistyakova, 2017; Rodichev, 2017; Sokolova, 2017; Safronov, 2018; Tyunnikov, 2017; Kass, 2018; Miller, 2018	Kasprzhak, 2013; Kharchenko, 2013; Frumin, 2013; Heinz, 2013; Bolotov, 2014; Havenson, 2014; Solovyov, 2014; Borisenkov, 2015; Terentyev, 2015; Gruzdev, 2013, 2015; Gorbunova, 2013, 2015; Churekova, 2015; Prahov, 2016; Kogan, 2016; Tyurin, 2016; Beetle, 2016; Richmond, 2016; Chehnczyuj, 2017; Floden, 2017; Richmond, 2017; Drake, 2017; Petchauer, 2017	Schleicher, 2011; Watkinson, 2011; Tinoca, 2011; McMahon, 2013; Forde, 2013; Dickson, 2013; Zeichner, 2014; Payne, 2014; Brayko, 2014; Volodina, 2014; Obolonskaya, 2014; Ratt, 2014; Yuzhaninova, 2014; Sergienko, 2015; Vinogradov, 2015; Panfilov, 2015; Panfilova, 2015; Rakhmanov, 2015; Lincove, 2015; Osborne, 2015; Mills, 2015; Evagorou, 2015; Dillon, 2015; Viiri, 2015; Albe, 2015; Muskin, 2015; Pisarev, 2016; Srinivasan, 2016; Engelbrecht, 2016; Ankiewicz, 2016; West, 2017; Saine, 2017; Li, 2018; Whiting, 2018	Kovaleva, 2011; Denischeva, 2011; Sheveleva, 2011; Li, 2012; Serdenciuc, 2013; Hökkä, 2013; Eteläpelto, 2013; Alexandrov, 2015; Tennisheva, 2015; Savelyev, 2015; Dubrovskaya, 2015; Sparrow, 2016; Saytimova, 2016; Sobolev, 2016; Miles, 2016; Lemon, 2016; Mitchell, 2016; Reid, 2016; Park, 2016; Tandberg, 2016; Shim, 2016; Hu, 2016; Herrington, 2016; Iwakuni, 2017; Asadullin, 2017; Cherednichenko, 2017; Nagovitsyn, 2018	Kasprzhak, 2013; Sidorkin, 2013; Kharchenko, 2013; Yanbarisova, 2014; Alexandrov, 2015; Margolis, 2015; Tennisheva, 2015; Savelyev, 2015; Borisenkov, 2015; Sergienko, 2015; Pinsk, 2015; Sparrow, 2016; Saytimova, 2016; Aydarova, 2016; Merenkov, 2016; Sushchenko, 2016; Pisarev, 2016	DeCorte, 2014; Sabirova, 2014; Miles, 2016; Lemon, 2016; Mitchell, 2016; Reid, 2016; Karelina, 2016; Sobolev, 2016; Sorokin, 2016; Ismagilov, 2017; Salnikov, 2017; Ger, 2017; Kaizer, 2017; Tyunnikov, 2017; Menter, 2017; Valeeva, 2017; Kalimullin, 2017	Kaplan, 2012; Trent, 2012; Furlong, 2013; Sidorkin, 2013; Kharchenko, 2013; Pereira, 2013; Roshchin, 2014; Rudakov, 2014; Ovcharov, 2015; Lopatkin, 2015; Maloshonok, 2015; Semenova, 2015; Terentyev, 2015; Fedorov, 2015; Gray, 2015; Hildenbrand, 2015; Schultz, 2015; Zagvyazinsky, 2016; Maslinsky, 2016; Ivanyushin, 2016; Pinsk, 2016; Ponomareva, 2016; Kosaretsky, 2016; Ilyina, 2016; Solyankina, 2016; Rijswijk, 2016; Akkerman, 2016; Schaap, 2016; Tartwijk, 2016; Reeves, 2016; Lowenhaupt, 2016; Adnot, 2017; Dee, 2017; Katz, 2017; Wyckoff, 2017; Gafurov, 2018; Valeeva, 2018; Kalimullin, 2018; Sakhieva, 2018; Lazarev, 2018; Margolis, 2018; Safronov, 2018; Fedina, 2018; Burmykina, 2018; Lumps, 2018; Kretov, 2018; Bressman, 2018; Hamilton, 2018; O'Dwyer, 2018; Winter, 2018; Efron, 2018

Theoretical methodical block

Implementation technology				
Ministry of Education and Science of the Russian Federation	Governing bodies of the regional education system	School	College of Education	Pedagogical university or faculty
Implementation of the network programs of additional education (PDO) "Young teacher" and teaching classes				
Providing opportunities for students who successfully completed the "Young Teacher" or teaching class to receive a certificate and a certificate for admission to a university or college without exams and the Unified State Examination subject to a special agreement, with the right to teach, combining studies at a university	Creation of pilot general educational organizations and institutions of additional education for the implementation of the Young Teacher circles and pedagogical classes	Implementation of high-quality and high-quantitative recruitment of schoolchildren in the network "Young Teacher" and pedagogical classes	Assistance to vocational guidance on the recruitment and active involvement in the educational process of the (PDO) "Young teacher" and pedagogical classes; training of qualified personnel in the network program of secondary vocational education, undergraduate and magistracy "Additional education in the field of social and educational activities" for work on the programs of additional education (PDO) "Young Teacher" and in teaching classes	
Creation of continuous vocational guidance activities of schoolchildren and students for further employment as a teacher, starting from the middle level of the school and ending with the magistracy and postgraduate studies				

Technological block

Providing the possibility of entering without a unified state examination, graduates of the (PDO) "Young teacher" and teaching classes, subject to admission to the target admission	Postponement from the army of secondary school and higher education graduates who are enrolled in the educational system (in the countryside) under a target agreement	Developing a favorable motivating teenagers to receive the profession of a teacher of the space "Being a modern teacher" of the school through class teachers and administrators	Creation of vocational guidance activities in an educational institution for the further continuation of training graduate students in higher education in the direction of "Pedagogical Education"	The abolition of admission to the exam, graduates of the (PDO) "Young teacher" and teaching classes
Creating a single entrance test (after grades 9 and 11) "Pedagogical education" (instead of the Unified State Exam), included in the monitoring indicator	Creating a regional pedagogical Olympiad for admission to the direction of "Pedagogical Education"			Development of a package of documents and holding of federal and regional pedagogical school olympiads
Creating a list of regional pedagogical Olympiads for schoolchildren and making adjustments to the list of benefits according to the rating approach				
Improving the continuous training program "Targeted training"				
Increase the target check digit for the target set to 90%	Establishment of employment monitoring in the teaching profession (MTUP) school graduates in (10%), after graduating from a higher educational institution	Creation of an open municipal and regional information system for obtaining targeted areas	Admission to the budget of applicants who have successfully completed (PDO) "Young teacher" or teaching class without exams and USE subject to the target contract	
			Correction of admission provisions for target destinations (90 %)	
Cancellation of the monitoring indicator (USE scores) on the target set	Implementation of a public online survey on the motivation to work as a teacher for schoolchildren, students "College-university"	The conclusion of contracts or targeted areas: the enrollee-school-university-employment organization		
		Development of the system of mentoring the future young specialist	Attraction of teachers from the university to the college's educational activities and, conversely, as part of the implementation of the network form of education	
Regulatory legal tightening of compulsory employment in the target area (at least 3 years)	Making adjustments to the regulations on the conduct of the competition "Teacher of the Year" and the certification requirements of teachers based on the indicators of the MTUP and public online survey	Creation of a municipal and regional experimental platform for continuous pedagogical education on the basis of the region		
Improving the social status of the future and the young teacher				
Receipt on special quotas only when providing a targeted direction	Creation of a unified information system (municipal and regional) on the social conditions of places for the employment of young professional teachers	Creating conditions for obtaining high-grade high-quality secondary vocational and higher education		
Cancel enrollment without USE college graduates non-pedagogical profile	Creation of conditions for comfortable professional activity of a young teacher	Development of an integrated university curriculum for full-time and distance education on a college-university trajectory, (2 years classroom + 2 years long-term practice with the possibility of employment)		
Providing employment opportunities for students with a certificate of incomplete higher education, subject to continuing education	Exclusion from the university only with a joint commission with representatives of the employer in the target area	Guaranteed budget place in the university subject to the direction of the target and subsequent employment	Development of new curricula for graduates of secondary schools (3 years classroom + 2 years in long-term practice with the possibility of employment)	

Technological block

Reducing the lack of high-quality teaching staff in educational, additional, pre-school, physical education, sports, creative areas of the region and leaving young teachers in the profession without increasing budget funding and material social investments

Result block

Fig. 1. Structural model of modernization of regional continuing pedagogical education in the system “school-college-institute”

3. Findings

From 2015 to the present, the developed author's system model is being gradually introduced into the process of training teachers in the Udmurt Republic. The results of its testing by year (2015-2018) for the above-indicated percentage indicators in the clusters "student-applicant-student" and "student-young teacher" are presented in [Figures 2-3](#):

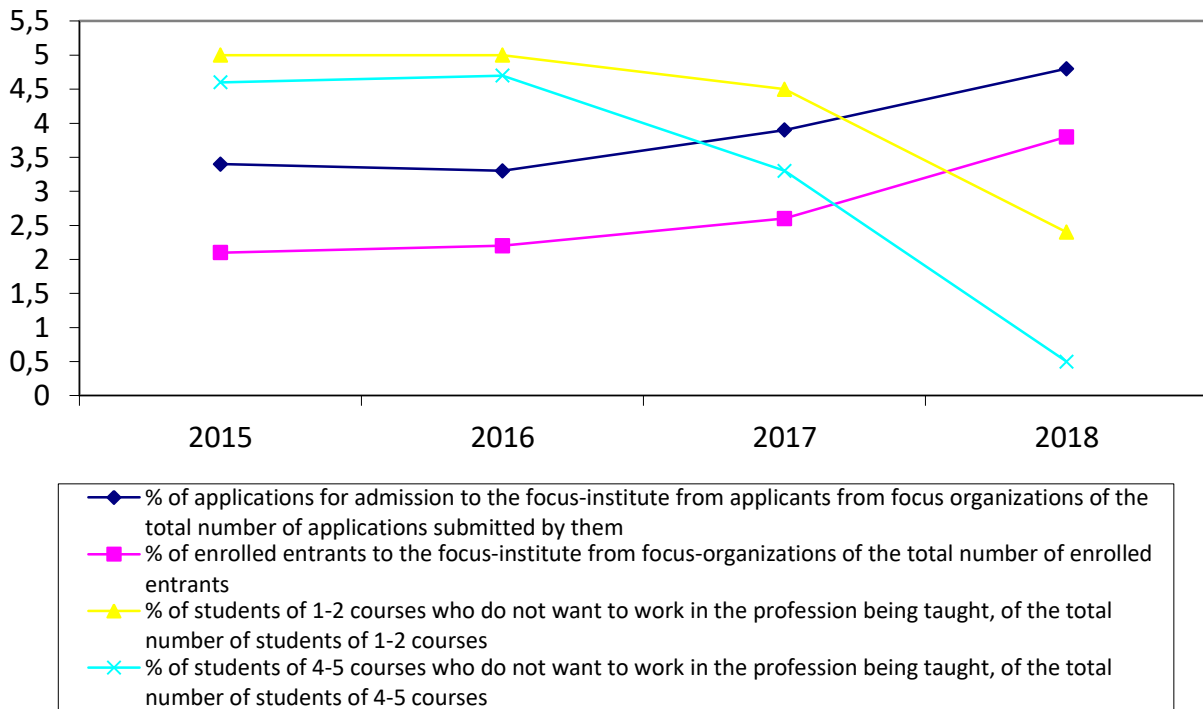


Fig. 2. The results of the introduction of the author's system model in the cluster "student-student-entrant"

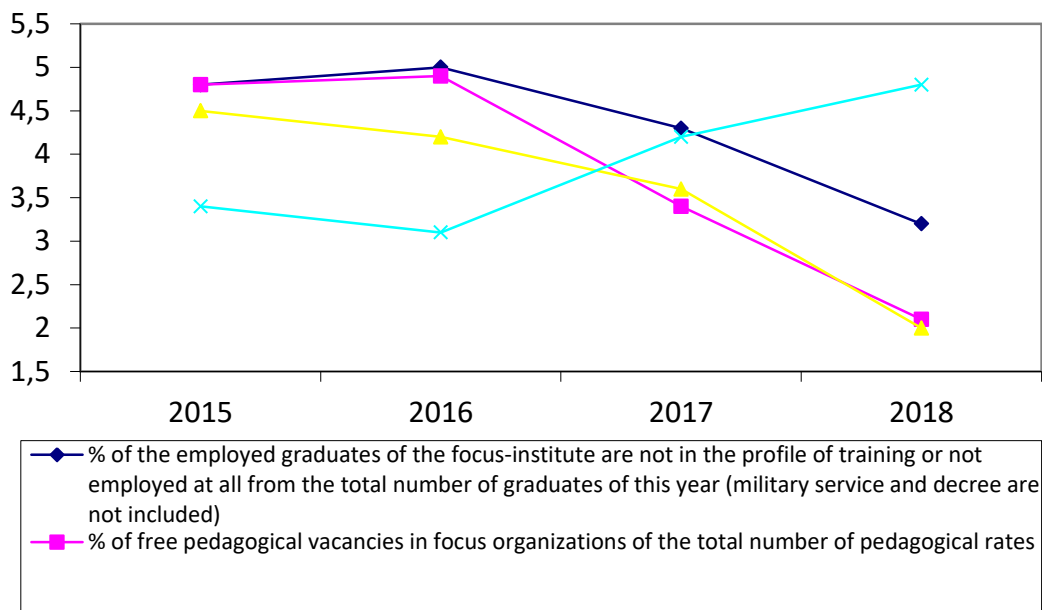


Fig. 3. The results of the introduction of the author's system model in the cluster "student-young teacher"

According to the results of experimental work, it was revealed that the introduction of a structural model for the modernization of regional continuing pedagogical education in the "school-college-university" system is generally effective for the implementation of teacher education in the region.

For a quantitative analysis of the data, it was used ($p = 0.01$ and $p = 0.05$) according to the formula: $t_e = |M - Z| / \sigma \cdot \sqrt{N}$, where M – the arithmetic average of the studied samples from four values of each analyzed year, Z – a normative indicator with which a comparison takes place (average data taken for the previous 2008-2014 years in the admissions office, at the faculty and in the employment department), N – the volume of the studied sample, σ – the variance of the studied sample. Moreover, the number of degrees of freedom T-test for one sample: $df = 4 - 1 = 3$. To make a reliable statistical decision, the level $p = 0.05$ was determined - the resulting indicator must be $t_e > 3.182$ or the level $p = 0.01$ – the resulting the indicator should be $t_e > 5,841$.

As a result of calculations obtained the following data:

- $t_e = 4.81$, which means that the percentage of the number of applications for admission by year to the focus-institute from applicants from focus organizations of the total number of applications submitted by them ($M = 3.85$; $\sigma = 0.686$; $N = 4$) is statistically significant exceeds the average standard indicator at $p = 0.05$, for previous years $Z = 2.2$. Total: $p < 0.05$;

- $t_e = 2$, which means that the percentage of enrolled applicants to the focus-institute of focus organizations from the total number of enrolled applicants by year ($M = 2.68$; $\sigma = 0.78$; $N = 4$) does not statistically significantly exceed the average normative indicator at $p = 0.05$, for previous years $Z = 1.9$. Total: $p > 0.05$;

- $t_e = 3.34$, which means that the percentage of 1-2 focus-institute courses that do not want to work in the profession being taught, of the total number of students, 1-2 courses by year ($M = 4.23$; $\sigma = 1.24$; $N = 4$) statistically significantly exceeds the average standard indicator at $p = 0.05$, for previous years $Z = 6.3$. Total: $p < 0.05$;

- $t_e = 5.85$, which means that the percentage of students in a 4-5 focus-institute course who do not want to work in the profession being taught is 4-5 in the total number of students in a year ($M = 3.27$; $\sigma = 1.96$); $N = 4$) statistically significantly exceeds the average standard indicator at $p = 0.01$, for previous years $Z = 9$. Total: $p < 0.01$;

- $t_e = 3.38$, which means that the percentage of employed graduates of a focus-institute is not in a training profile or not employed at all from the total number of graduates by year ($M = 4.33$; $\sigma = 0.81$; $N = 4$) is statistically significant exceeds the average standard figure at $p = 0.05$, in previous years $Z = 5.7$. Total: $p < 0.05$;

- $t_e = 1.67$, which means that the percentage of free pedagogical vacancies in focus organizations of the total number of pedagogical rates in focus organizations by year ($M = 3.8$; $\sigma = 1.32$; $N = 4$) does not statistically significantly exceed the average standard indicator at $p = 0.05$, for previous years $Z = 4.9$. Total: $p > 0.05$;

- $t_e = 5.98$, which means that the percentage of young specialists in focus organizations leaving the profession in the first 3 years after starting work from the total number of teachers in focus organizations by year ($M = 3.58$; $\sigma = 1.11$; $N = 4$) statistically significantly exceeds the average standard indicator at $p = 0.01$, for previous years $Z = 6.9$. Total: $p < 0.01$;

- $t_e = 2.03$, which means that the percentage of young specialists up to 25 years of the total number of working teachers in focus organizations by year ($M = 3.88$; $\sigma = 0.77$; $N = 4$) does not statistically significantly exceed the average standard indicator at $p = 0.05$, for previous years $Z = 3.1$. Total: $p > 0.05$.

It should be noted that especially reliable results with $p = 0.01$ were recorded in the “student-university-student-student” cluster in reducing the number of 4-5-year students who did not want to work in the teaching profession, and in the “student-young teacher” cluster in reducing the number of young professionals in focus organizations leaving the profession in the first 3 years after the start of their professional activities in the field of education and training. Positive reliable shifts were recorded at $p = 0.05$, both in the increase in the number of applications for enrollment and the total number of focus organizations admitted to the focus-institute, and in the employment of graduates in the field of study. In general, the implementation of the presented model contributed to the filling of free pedagogical vacancies in focus organizations and a significant reduction in the age (rejuvenation) of teaching staff in participating educational institutions.

4. Discussion

The results of research work complement the data of a study on the study of various motives of applicants in choosing pedagogical professions (Kass, Miller, 2018). Scientific work (Eremenko, 2014), which proposes the technology of reducing the term of training in continuing vocational training "college-university" in the educational trajectories of "4 + 2". And also the following results of the research work, where it is proved that the conditions for continuing education in a higher education institution are only for targeted training through building a system of pedagogical education in the form of a model of vertical integration of single-profile educational institutions within a single pedagogical complex (Sergienko, 2015).

In particular, our results reveal the depth to a holistic understanding of the improvement of the admissions campaign in the pedagogical direction: the creation of pedagogical classes, the active involvement of the “Young Teacher” educational programs in the educational process. So in the study (Zhuk, 2016), similar results were obtained: the need to create a system of continuous pedagogical education from school, expressed in purposeful work with high school students to prepare them for the informed choice of the teacher's profession. As well as in the work (Terentiev et al., 2015), in which new principles are proposed for admission to pedagogical universities, “not so much that I will enter where I will go to a budget place, but only where I will work”.

In turn, the practical results of this study allow us to expand the possibilities for increasing the effectiveness of vocational training based on the cluster approach. The results of the theoretical study are consistent with the implementation and implementation of the college-university training system (Aleksandrov et al., 2015; Iwakuni, 2017), and the school-university interconnected cluster (Volodina et al., 2017; Vinogradov et al., 2015; West, Saine, 2017, etc.).

The content of the technological unit developed in the study of the modernization model of regional continuing pedagogical education in the aspect of postgraduate support of graduates of pedagogical profile corresponds to the scientific results (Zagvyazinsky, 2016; Ilyina, Solyankina, 2016; Pinskaya et al., 2016). The studies suggest the creation of special “pedagogical residencies” with experience in the implementation of internship sites, in general, the system of professional adaptation of graduates, starting with the graduation course and ending with the first three years of professional activity in school.

In the study (Khavenson, Solovyova, 2014), based on the analysis of the respondents' performance at five Russian universities, the authors conclude that the predictive ability of the total USE score is acceptable in order to recognize this exam as a valid tool for the selection of applicants. However, the results of our study on the study of students of pedagogical profile prove that there is

no pattern in the academic performance of students – future teachers, their further employment in the field of study and individual entrance exam scores in a pedagogical university. It should be noted that even the majority of students who had low ranking indicators for admission, receive higher marks for training and work experience in the training process (Nagovitsyn et al., 2018). On the basis of the obtained comparative research data and practical recommendations for improving the quality of teacher education, which are associated with scientific results (Kasprzhak, 2013; Borisenkov, 2015; Sobolev, 2016) are made.

In general, the results presented in the study prove the need to study the main directions of the modernization of pedagogical education: the implementation of the network of additional education programs (PDO) "Young Teacher" and teaching classes; the creation of continuous vocational guidance activities for schoolchildren and students for further employment as a teacher, beginning with the middle level of the school and ending with the magistracy and postgraduate studies; improvement of the continuous training program "Target training", the creation of a systematic and centralized program to improve the social status of the future and the young teacher. The development of theoretical principles, modeling and conducting a practical block of experimental work proved the effectiveness of the systemic impact on the above directions to the system of pedagogical education in the region.

5. Conclusion

Thus, the study presents the author's vision of the modernization of pedagogical education in the region in the cluster systems "student-entrant" "entrant-student" and "student-young teacher". The study of the regulatory framework and theoretical and methodological literature on the problems of research allowed to create a system model for the implementation of the main activity processes for the modernization of teacher education in the region. The effectiveness of the introduction of the model is actively increasing from 2015 to 2018 according to the criteria proposed in the study, which are developed on the basis of a comparative analysis of the studied scientific literature and a controversial evaluation of domestic and foreign studies on this topic.

Realization in the practice of authoring allowed to get positive results at each link of the holistic system of the educational route of the region: from schoolchild to young specialist. The increase in the number of applicants for pedagogical training profiles, the increase in students' motivation from the first to the fifth year to future professional activities in the education system and the upbringing of the younger generation, as well as the directly proportional reduction in the shortage of young specialists in this area in various organizations of the region holistically shows the need to continue the author's research. The ongoing study will allow to get more reliable results by 2022, supplement the main directions of the author's model, identify the main regularities of the modernization process and further paradigm strategy of the educational process in the region at all levels of the educational system.

References

- Adnot et al., 2017 – Adnot, M., Dee, T., Katz, V., Wyckoff, J. (2017). Teacher Turnover, Teacher Quality, and Student Achievement in DCPS. *Educational Evaluation and Policy Analysis*, 39(1): 54-76. DOI: 10.3102/0162373716663646
- Alashev et al., 2016 – Alashev, S.Yu., Kogan, E.Ya., Tyurina, N.V. (2016). Vostrebovannost' vuzov: podkhody k izmereniyu [The demand for universities: approaches to measurement]. *Voprosy obrazovaniya*, 4: 186-205. DOI: 10.17323 / 1814-9545-2016-4-186-205 [in Russian]
- Aleksandrov et al., 2015 - Aleksandrov, D.A., Tenisheva, K.A., Savelieva, S.S. (2015). Mobil'nost' bez riskov: obrazovatel'nyy put' «V universitet cherez kolledzh» [Mobility without risks: the educational path "To the university through college"]. *Voprosy obrazovaniya*, 3: 66–91. DOI: 10.17323 / 1814-9545-2015-3-66-91 [in Russian]
- Asadullin, 2017 – Asadullin, R.M. (2017). Integratsiya funktsional'noy i predmetnoy podgotovki budushchikh uchiteley [Integration of the functional and substantive training of future teachers]. *Pedagogika*, 3: 70-78. [Electronic resource]. URL: <https://elibrary.ru/item.asp?id=28916199> [in Russian]
- Aydarova, 2016 – Aydarova E.V. (2016). Bedstvennoye polozheniye uchiteley i ukhod studentov-pedagogov iz professii. Vosprinimayemoye, perezvivayemoye i ponimayemoye prostranstvo shkoly [The plight of teachers and the departure of student teachers from the

profession. Perceived, experienced and understood space of the school]. *Voprosy obrazovaniya*, 2: 183-207. DOI: 10.17323 / 1814-9545-2016-2-183-207 [in Russian]

Bignold, Barbera, 2012 – *Bignold, W., Barbera, J.* (2012). Teaching assistants and teacher education in England: meeting their continuing professional development needs. *Professional Development in Education*, 38(3): 365-375. DOI: 10.1080/19415257.2011.621967

Borisenkov, 2015 – *Borisenkov, V.P.* (2015). Povysheniye kachestva shkol'nogo obrazovaniya sovremennoy Rossii [Improving the quality of school education in modern Russia]. *Pedagogika*, 10: 14-24. [Electronic resource]. URL: <http://pedagogika-rao.ru/journals/2015/12/> [in Russian]

Cherednichenko, 2017 – *Cherednichenko, G.A.* (2017). Rossiyskaya molodezh' v sisteme obrazovaniya: ot urovnya k urovnyu [Russian youth in the education system: from level to level]. *Voprosy obrazovaniya*, 3: 152-182. DOI: 10.17323 / 1814-9545-2017-3-152-182 [in Russian]

Eremenko, 2014 – *Eremenko Yu.I.* (2014). Innovatsionnyye prikladnyye programmy bakalavriata v sisteme obrazovaniya kolledzha-tekhnicheskogo kolledzha [Innovative applied baccalaureate programs in the college-technical college educational system]. *Integratsiya obrazovaniya*, 2(75): 44-48. DOI: 10.15507/Inted.075.018.201402.044 [in Russian]

Fedorov, Sedykh, 2015 – *Fedorov, A.A., Sedykh, E.P.* (2015). Modelirovaniye protsessov tselevogo obucheniya i trudoustroystva v sisteme pedagogicheskogo obrazovaniya [Modeling of processes of target training and employment in the system of pedagogical education]. *Psikhologicheskaya nauka i obrazovaniye*, 5(20): 93-98. DOI: 10.17759/pse.2015200508 [in Russian]

Floden et al., 2017 – *Floden, R.E., Richmond, G., Drake, C., Petchauer, E.* (2017). How Teacher Education Can Elevate Teacher Quality: Evidence From Research. *Journal of Teacher Education*, 68(4): 360-362. DOI: 10.1177/0022487117721190

Gafurov et al., 2018 – *Gafurov, I.R., Valeeva, R.A., Kalimullin, A.M., Sakhieva R.G.* (2018). Opyt aprobatsii praktiko-oriyentirovannykh programm magistratury po napravleniyu podgotovki «Obrazovaniye i pedagogicheskiye nauki» (Pedagog osnovnogo obshchego obrazovaniya) [The experience of testing a practice-oriented graduate program in the direction of education “Education and pedagogical sciences” (Teacher of basic general education)]. *Psikhologicheskaya nauka i obrazovaniye*, 23(1): 25-37. DOI: 10.17759 / pse.2018230102 [in Russian]

Ilina, Solyankina, 2016 – *Ilina, N.F., Solyankina, N.L.* (2016). Differentsiatsiya i otsenivaniye urovney professional'nogo stanovleniya pedagoga [Differentiation and assessment of the levels of professional development of a teacher]. *Pedagogika*, 4: 76-81. [Electronic resource]. URL: <http://pedagogika-rao.ru/journals/2016/05/> [in Russian]

Ismagilov et al., 2017 – *Ismagilov, R.F., Salnikov, P.P., Ger, O.E. Kaize, r A.G.* (2017). Russian Education. A Revolution and Then a Fall. *Russian Education & Society*, 58(5-6): 355-387. DOI: 10.1080/10609393.2016.1295772

Iwakuni, 2017 – *Iwakuni, S.* (2017). Impact of initial teacher education for prospective lower secondary school teachers in Rwanda. *Teaching and Teacher Education*, 67: 538-549. DOI: 10.1016/j.tate.2017.08.001

Kasprzhak, 2013 – *Kasprzhak, A.G.* (2013). [Institutsional'nyye tupiki Rossiyskoy sistemy podgotovki uchiteley] Institutional deadlocks of the Russian teacher training system. *Voprosy obrazovaniya*, 4: 261-282. [Electronic resource]. URL: https://vo.hse.ru/data/2014/02/15/1328118373/Kasprzhak.indd_261.pdf [in Russian]

Kass, Miller, 2018 – *Kass, E. Miller, E.C.* (2018). Career choice among academically excellent students: Choosing teaching career as a corrective experience. *Teaching and Teacher Education*, 73: 90-98. DOI: 10.1016/j.tate.2018.03.015

Khavenson, Solovyova, 2014 – *Khavenson, T.E., Solovyova, A.A.* (2014). Svyaz' rezul'tatov Yedinogo gosudarstvennogo ekzamena i uspevayemosti v vuze [Connection of the results of the Unified State Exam and academic performance in high school]. *Voprosy obrazovaniya*, 1: 176-199. [Electronic resource]. URL: <https://vo.hse.ru/data/2014/03/23/1318101481/Havenson.pdf> [in Russian]

Kurdenkova, 2014 - *Kurdenkova, O.P.* (2014). Realizatsiya kontseptsii nepreryvnogo obrazovaniya v vedushchikh vuzakh Rossii [Implementation of the concept of continuing education in leading universities in Russia]. *Pedagogika*, 7: 79-85. [Electronic resource]. URL: <https://elibrary.ru/item.asp?id=22830837> [in Russian]

Li et al., 2018 – *Li, L., Huang, C., Chen, X., Tao, L., Huang, Y., Zhou, X.* (2018). Reform Course and Development Status of China's Education System. Springer, Berlin, Heidelberg. DOI:

10.1007/978-3-662-55525-5_3

[Margolis, 2015](#) – *Margolis, A.A.* (2015). Modeli podgotovki uchiteley v ramkakh prikladnykh programm bakalavriata i pedagogicheskoy magistratury [Models of teacher training in the framework of applied bachelor and pedagogical magistracy programs]. *Psikhologicheskaya nauka i obrazovaniye*, 20(5): 45–64. DOI: 10.17759/pse.2015200505 [in Russian]

[Maslinsky, Ivanyushina, 2016](#) – *Maslinsky, K.A., Ivanyushina, V.A.* (2016). Ostavat'sya uchitelem? Faktory, vliyayushchiye na otnosheniye k ukhodu iz professii uchitelya [Stay teacher? Factors influencing attitudes to leaving the teaching profession]. *Voprosy obrazovaniya*, 4: 8-30. DOI: 10.17323/1814-9545-2016-4-8-30 [in Russian]

[McMahon et al., 2013](#) – *McMahon, M., Forde, C., Dickson, B.* (2013). Reshaping teacher education through the professional continuum. *Educational Review*, 67(2): 158-178. DOI: 10.1080/00131911.2013.846298

[Miles et al., 2016](#) – *Miles, R., Lemon, N., Mitchell, D.M., Reid, J. A.* (2016). The recursive practice of research and teaching: reframing teacher education. *Asia-Pacific Journal of Teacher Education*, 44(4): 401-414. DOI: 10.1080/1359866X.2016.1169502

[Nagovitsyn et al., 2017](#) – *Nagovitsyn, R.S., Maksimov Y.G., Miroshnichenko A.A., Senator S.J.* (2017). Realizatsiya didakticheskoy modeli podgotovki studentov k novatorstvu v protsesse nepreryvnogo obrazovaniya budushchego uchitelya [Implementation of the didactic model of preparing students for innovative practice within the framework of continuing teacher education]. *Vestnik Novosibirskogo gosudarstvennogo pedagogicheskogo universiteta*, 7(5): 7-24. DOI: 10.15293/2226-3365.1705.01. [in Russian]

[Nagovitsyn et al., 2018](#) – *Nagovitsyn, R.S., Tutolmin, A.V., Maksimov, Y.G., Volkov, P.B.* (2018). [Tekhnologiya realizatsii nepreryvnogo fizkul'turnogo obrazovaniya (kolledzh-vuz) na primere professional'noy podgotovki po profilyu "Fizicheskaya kul'tura" i "Angliyskiy yazyk"]. Continuous college-to-university physical education technology: Case study of physical education and English language disciplines. *Teoriya I Praktika Fizicheskoy Kultury*, 2: 21-23. [Electronic resource]. URL: <https://elibrary.ru/item.asp?id=32330536> [in Russian]

[Nagovitsyn et al., 2018](#) – *Nagovitsyn, R.S., Chigovskaya-Nazarova, Y.A., Miroshnichenko, A.A., Senator, S.Y.* (2018). The Realization of the System Programme “Health Saving Education” in the Pedagogical University. *European Journal of Contemporary Education*, 7(1): 137-149. DOI: 10.13187/ejced.2018.1.137.

[Nagovitsyn et al., 2018](#) – *Nagovitsyn, R.S., Miroshnichenko, A.A., Senator, S.Yu.* (2018). Realizatsiya mobil'noy pedagogiki v nepreryvnom obrazovanii uchiteley fizicheskoy kul'tury [Implementation of mobile pedagogy during continuous education of physical culture teachers]. *Integratsiya obrazovaniya*, 22(1): 107-119. DOI: 10.15507/1991-9468.090.022.201801.107-119 [in Russian]

[Ovcharov, Lopatkin, 2015](#) – *Ovcharov, A.V., Lopatkin, V.M.* (2015). Problema bezopasnosti studencheskogo naseleniya v kontekste sovremennoy modeli obucheniya [The problem of the safety of the student population in the context of the modern teaching model]. *Vestnik Novosibirskogo gosudarstvennogo pedagogicheskogo universiteta*, 6(28): 58-67. DOI: 10.15293/2226-3365.1506.07 [in Russian]

[Park et al., 2016](#) – *Park, T.J., Tandberg, D.A., Shim, H.K., Hu, S., Herrington, C.D.* (2016). Community College Teacher Education Baccalaureate Programs. Early Evidence Yields Mixed Results. *Educational Policy*, 4: 121-129. DOI: 10.1177/0895904816682317

[Pereira, 2013](#) – *Pereira, F.* (2013). Concepts, policies and practices of teacher education: an analysis of studies on teacher education in Portugal. *Journal of Education for Teaching*, 39(5): 474-491. DOI: 10.1080/02607476.2013.844957

[Pinskaya et al., 2016](#) – *Pinskaya, M.A., Ponomareva, A.A., Kosaretsky, S.G.* (2016). Professional'noye razvitiye i podgotovka molodykh uchiteley v Rossii [Professional development and training of young teachers in Russia.] *Voprosy obrazovaniya*, 2: 100–124. DOI: 10.17323 / 1814-9545-2016-2-100-124 [in Russian]

[Pushkareva, 2016](#) – *Pushkareva, E.A.* (2016). Nepreryvnoye obrazovaniye v razvitii menyayushchegosya obshchestva i lichnosti: integratsiya nauchnykh pozitsiy v Rossii i za rubezhom [Continuing education in the development of a changing society and personality: the integration of research positions in Russia and abroad]. *Integratsiya obrazovaniya*, 20(4): 438–445. DOI: 10.15507/1991-9468.085.020.201604.438-445 [in Russian]

- Rijswijk et al., 2016 – Rijswijk, M., Akkerman, S. F., Schaap, H., Tartwijk, J. (2016). Past perceptions and future expectations: Sensed dis/continuity at the start of teacher education. *Teaching and Teacher Education*, 58: 99-108. DOI: 10.1016/j.tate.2016.05.002
- Sabirova, 2014 – Sabirova, D.R. (2014). Continuous Teacher Education: Quality Assurance. *Procedia – Social and Behavioral Sciences*, 143: 243-246. DOI: 10.1016/j.sbspro.2014.07.396
- Schleicher, 2011 – Schleicher, A. (2011). Building a high-quality teaching profession. *Lessons from around the world*, OECD Publishing, Paris. DOI: 10.1787/9789264113046-en
- Sergienko, 2015 – Sergienko, Yu.P. (2015). Sovremennyye problemy professional'nogo obrazovaniya v Rossii i v mire ("Kruglyy stol") [Modern problems of vocational education in Russia and in the world ("Round table")]. *Pedagogika*, 6: 81-82. [Electronic resource]. URL: <https://elibrary.ru/item.asp?id=23999279> [in Russian]
- Sidorkin, 2013 – Sidorkin, A.M. (2013). Professional'naya podgotovka uchiteley v SSHA: uroki dlya Rossii [Professional teacher training in the USA: lessons for Russia]. *Voprosy obrazovaniya*, 1: 136-155. [Electronic resource]. URL: https://vo.hse.ru/data/2014/08/04/1314334288/2013-1_Sidorkin.pdf [in Russian]
- Sobolev, 2016 – Sobolev, A.B. (2016). The Network Form of Implementing Educational Programs. *Russian Education & Society*, 58(1): 30-43. DOI: 10.1080/10609393.2016.1205921
- Terentyev et al., 2015 – Terentyev, E.A., Gruzdev, I.A., Gorbunova, E.V. (2015). Sud idet: diskurs prepodavateley ob otseve studentov [The trial is underway: the discourse of teachers on the elimination of students]. *Voprosy obrazovaniya*, 2: 129-151. DOI: 10.17323/1814-9545-2015-2-129-151 [in Russian]
- Trent, 2012 – Trent, J. (2012). Becoming a teacher: the identity construction experiences of beginning English language teachers in Hong Kong. *The Australian Educational Researcher*, 39(3): 363–383 DOI: 10.1007/s13384-012-0067-7
- Vinogradov et al., 2015 – Vinogradov, V.L., Panfilov, A.N., Panfilova, V.M., Rakhmanova A.R. (2015). Integrirovannoye obrazovatel'noye prostranstvo universiteta i shkoly kak osnova praktiko-oriyentirovannoy podgotovki budushchikh uchiteley [Integrated educational space of the university and the school as the basis of practice-oriented training of future teachers]. *Psikhologicheskaya nauka i obrazovaniye*, 5(20): 142–153. DOI: 10.17759 / pse.2015200513 [in Russian]
- Volodina et al., 2017 – Volodina, G.E., Obolonskaya, A.V., Ratt, T.A. (2014). Universitetsko-shkol'nyy klaster – eto sreda dlya razvitiya professional'nykh kompetentsiy uchitelya [The university-school cluster is an environment for the development of professional competencies of a teacher]. *Voprosy obrazovaniya*, 1: 46-63. URL: <https://vo.hse.ru/data/2014/03/24/1318115029/Volodina.pdf> [in Russian]
- West, Saine, 2017 – West, J.A., Saine, P. (2017). The Mentored Multigenre Project: Fostering Authentic Writing Interactions Between High School Writers and Teacher Candidates. *Journal of Adolescent & Adult Literacy*, 60(6): 629-641. DOI: 10.1002/jaal.602
- Yakovleva, 2015 – Yakovleva, N.I. (2015). Sistema nepreryvnogo obrazovaniya kak usloviye innovatsionnogo razvitiya regiona [The system of continuous education as a condition for the innovative development of the region]. *Pedagogika*, 6: 100-105. URL: <http://pedagogika-rao.ru/journals/2015/08/> [in Russian]
- Yuzhaninova, 2014 – Yuzhaninova, A.V. (2014). Ozhidaniya shkol'nikov otnositel'no budushchey raboty [Expectations of schoolchildren regarding future work]. *Voprosy obrazovaniya*, 1: 200-216. [Electronic resource]. URL: <https://vo.hse.ru/data/2014/03/23/1318093117/Yuzhaninova.pdf> [in Russian]
- Zagvyazinsky, 2016 – Zagvyazinsky, V.I. (2016). O vedushchikh napravleniyakh podgotovki uchiteley v vuze [On the leading orientations of teacher training at the university]. *Pedagogika*, 9: 77-83. [Electronic resource]. URL: <http://pedagogika-rao.ru/journals/2016/11/> [in Russian]
- Zeichner, 2012 – Zeichner, K. (2012). Rethinking the Connections Between Campus Courses and Field Experiences in College- and University-Based Teacher Education. *Journal of Teacher Education*, 61(1-2): 89-99. DOI: 10.1177/0022487109347671
- Zhuk, 2016 – Zhuk, A.I. (2016). Respublika Belarus': spetsializirovannaya pedagogicheskaya podgotovka v shkole [The Republic of Belarus: specialized pedagogical training at school]. *Pedagogika*, 5: 118-125. [Electronic resource]. URL: <http://pedagogika-rao.ru/journals/2016/06/> [in Russian]