Управленческие подходы к решению проблемы кадрового дефицита в системе образования

Введение. Поддержка отстающих школ – стандартная практика стран – лидеров международных образовательных рейтингов. Современная образовательная организация сталкивается с целым рядом трудностей, связанных с внутренними и внешними условиями их работы, в частности с кадровым оснащением, что в сочетании с другими причинами может привести к росту рисков учебной неуспешности обучающихся.

Цель исследования – проанализировать причины нехватки педагогических кадров и предложить эффективные управленческие решения по их устранению.

Материалы и методы. В качестве материалов использованы научные статьи, монографии, интернет-ресурсы, а также материалы статистических данных по основным показателям состояния педагогических кадров системы общего образования. В качестве основного метода использован компаративный анализ современной научной литературы по проблеме нехватки учителей.

Результаты исследования. Наряду с недостатками регулятивного воздействия государства на рынок труда в качестве причин нехватки педагогов отмечаем ситуативное самоопределение части абитуриентов педагогических вузов и колледжей, отсутствие поддержки начинающих учителей и стагнацию профессионального развития педагогов-профессионалов.

Установлено, что эффективные кадровые решения предполагают многосторонний подход к решению проблемы: внедрение надлежащих процедур набора и распределения кадров; создание достойных условий труда; финансовые стимулы; поддержка учителей на уровне школ и карьерный рост преподавателей.

Определен комплексный подход к решению проблемы преодоления дефицита педагогических кадров, включающий: повышение количества мотивированных абитуриентов для педагогических вузов и колледжей через профильные психолого-педагогические классы; улучшение системы подготовки учителей; реализацию программы «Земский учитель» с целью закрепления молодых специалистов; переподготовку; внедрение сетевого взаимодействия; пропаганду престижности профессии учителя.

Заключение. Выявлены причины нехватки педагогических кадров; проведена инвентаризация эффективных и неэффективных управленческих подходов к преодолению нехватки педагогических кадров; теоретически обоснован комплексный подход к решению проблемы преодоления дефицита педагогических кадров.

Реализация только государственных программ и подключение региональных и муниципальных органов исполнительной власти не решат проблему нехватки педагогов. Нужна консолидация усилий (межведомственное взаимодействие) всех заинтересованных социальных партнеров в профориентации школьников, подготовке студентов, непрерывном образовании педагогов, что, наряду с повышением заработной платы, позволит решить проблему и приведет к более эффективному развитию российского образования.

Ключевые слова: риски снижения образовательных результатов обучающихся, дефицит педагогических кадров, управленческие подходы к решению проблемы кадрового дефицита

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Management approaches to solving the problem of personnel shortage in the education system

Introduction. Supporting lagging schools is standard practice for countries that are leaders in international educational rankings. Modern educational organizations face a number of difficulties associated with the internal and external conditions of their work, in particular with staffing problems, which, when combined with other reasons, can lead to an increase in the risks of educational failure of students.

This research aims to analyze the causes of the teaching staff shortage and propose efficient management solutions to eliminate them.

Materials and methods. The materials used were scientific articles, monographs, Internet resources, as well as statistical data on the main indicators of the state of the teaching staff of the general education system. As the main method, a comparative analysis of modern scientific literature on the problem of teacher shortage was used.

Results. Along with the shortcomings of the state’s regulatory impact on the labor market, the situational self-determination of some applicants for teacher training universities and colleges, the lack of support for novice teachers, and the stagnation of the professional development of experienced teachers have been determined as the reasons for the teacher shortage.

It has been established that efficient personnel decisions involve a multilateral approach to solving the problem: the introduction of proper procedures for the recruitment and distribution of personnel; creating decent working conditions; financial incentives; support for teachers at the school level and career development of teachers.

An integrated approach to solving the problem of overcoming the teaching staff shortage has been determined and included the following: increasing the number of motivated applicants for teacher training universities and colleges through specialized psychological and pedagogical classes; improving the system of teacher training; implementing the Zemsky Teacher program in order to retain young professionals; retraining; implementing the networking; promoting the prestige of the teaching profession.

Conclusion. The reasons for the teaching staff shortage have been identified; an inventory of efficient and inefficient management approaches to overcome the teaching staff shortage has been performed; a comprehensive approach to solving the problem of overcoming the teaching staff shortage has been theoretically substantiated.

The implementation of only state programs and the involvement of regional and municipal executive authorities will not solve the problem of the teaching staff shortage. It is necessary to consolidate the efforts (interdepartmental interaction) of all social partners interested in vocational guidance for schoolchildren, training students, continuous education of teachers, which, along with an increase in salaries, will solve the problem and lead to the more efficient development of Russian education.

Keywords: risks of reducing the educational results of students, teaching staff shortage, management approaches to solving the staff shortage problem

For Reference:
Introduction

The documents of international organizations indicate the need to ensure the right of all citizens to quality education and life-long learning and to reinforce education as a public endeavor and common good, including strengthening support for teachers. Thus, one of the areas of work of the United Nations in modern conditions implies the promotion of sustainable development. According to the 2030 Agenda for Sustainable Development [1], the vision of the future is ambitious and focused on transformation, where “everyone has equal and universal access to quality education at all levels” [1, p. 4]. The new Agenda implies creating an environment conducive to the full realization of the rights and opportunities of children and young people, which “will allow countries using the demographic dividend, including through safe school environments and cohesive communities and families” [1, p. 9].

The Brussels Declaration of the 2018 UNESCO Global Education Meeting recognizes teaching as a profession in its own right; teachers, school administrators, educators, and trainers together play an important role in realizing the common task of preparing future generations. Strengthening support for teachers and the resource base for education will ensure professional training and continuing education, the implementation of proper recruitment and placement procedures, the creation of decent working conditions and opportunities for the exchange of best practices, professional independence, and the career development of teachers. The necessity to take measures aimed at preventing the turnover of teaching staff and designed to provide motivation and support for a highly qualified, competent and adequately resourced and empowered teaching staff has been determined. In addition, the meeting participants should be committed to promoting the recognition of the importance of the work of teachers and raising the status of the teacher and the prestige of the teaching profession in order to involve them and their organizations and institutions in the process of developing, monitoring, and evaluating education policy [2].

The release of the United Nations Transforming Education Summit, convened in response to a global crisis in education – one of equity and inclusiveness, quality and relevance, determines the need to elevate education to the top of the global political agenda and to mobilize action, ambition, solidarity, and solutions to recover from the pandemic-related learning losses and sow the seeds to transform education in a rapidly changing world [3].

The statement of the UN Secretary-General Guterres on the vision for the future of transforming education indicates the need for a new social contract for education built on two principles: guaranteeing the right to quality life-long education and strengthening education as a public endeavor and a common good. Truly transformational education should be rooted in the needs of the community, family, parents, and children and respond to local, national, and global needs, cultures, and opportunities. In order to achieve this, transformational education should support students in the following four key areas: learn to learn, learn to live together, learn to work, learn to be oneself – to develop one’s potential, enjoy life, and live it to the fullest [4].

The achievement of these ambitious goals is hampered by the problem of personnel shortage in education, which is international in nature and is referred to in English-speaking countries as “teacher shortage”, and in Russian sources as “teaching staff shortage”.

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A number of foreign publications address the problem of teacher shortage in the United States of America and European countries. The authors of these publications determine the following problems with personnel: unfilled vacancies in schools [5; 6]; reduction in the number of students enrolled in teacher training programs [7; 8].

The following reasons are determined and analyzed in foreign studies: a combination of low salaries, limited career opportunities, and difficult work [9]. Greene [10] notes an insufficient pay level and low prestige of the profession as the reasons for the teacher shortage. Based on data from a survey of college students and teachers, Tran and Smith [11] designate a lack of respect for the teaching profession, low pay, hyperscrunity, and poor working conditions in schools as the root causes of the problem.

An analysis of the teaching staff representation in the labor market in the regions of the Russian Federation also reveals an increase in the number of students per teacher in general education institutions [12]; availability of teaching vacancies [13]. Some studies note that schools in rural areas experience problems with the provision of material resources and personnel to a greater degree [14].

At the same time, a better understanding of the reasons for the teacher shortage requires not only studying the influence of individual factors on the shortage of personnel but also studying the interaction between them.

Teacher shortage reduction strategies used in several US states are presented in the study by Tran and Smith [11]. They include various options for reducing the requirements for recruiting applicants and certifying new teachers in order to quickly attract new people to the teaching profession. Another research with a team of authors representing various European countries [15] demonstrates their attempts to solve the problem of teacher shortage by means of the following approaches: express training for novice teachers before the start of the academic year in France; the use by British school principals of non-specialist teachers; increase in class sizes.

However, these approaches, according to the authors, do not eliminate the true causes of the teacher shortage.

Russian researchers also demonstrate the inefficient regulatory impact of the state on the labor market for eliminating the imbalance in the education system: the abolition of the state distribution of university graduates; commercialization of education; reduction of state funding for educational and scientific activities; the lack of a holistic, scientifically based perspective vision of the development of the teaching staff market in the context of rapid changes [12].

The need for a better understanding of the causes of teacher shortage and strategies to address this has been revealed. The joint search for management approaches to solving the problem, which is international in nature, is considered to be relevant.

This research aims to analyze the causes of the teaching staff shortage and search for efficient management solutions to eliminate them.

Materials and methods

The research materials included scientific publications by Russian and foreign authors: articles, monographs, Internet resources, as well as statistical data on the main indicators of the state of teaching staff in the general education system. The research also used the results of studies conducted in the EU and other international organizations (UNESCO, UN);
Internet resources, including official websites of international organizations, websites of research centers, educational institutions; open archival, library, and educational resources.

The following research methods were used: source study; comparative description; comparative analysis of management approaches to overcoming the personnel shortage in Russian and foreign theory and practice of general education; comparative analysis; and linguistic analysis for the correct interpretation of terms.

**Results**

In the English-language sources, the authors use the term “teacher shortage” – “lack of teachers” to refer to the problem of the teaching staff shortage.

A number of publications reveal the problem of the teacher shortage in the United States of America and its causes.

According to Daliri-Ngametua and Hardy [16], the depreciation of teachers' work, the demoralization of teachers due to difficult working conditions, and the decrease in the volume of educational interactions in schools, which ensure genuine participation of students in the educational process, are the main causes of the personnel shortage. It is emphasized that in modern conditions, teaching practice is performed in conditions of increased attention to quantitative data measurements as evidence of learning outcomes, which results in a decrease in the importance of education and socialization and can jeopardize the long-term academic and social development of students.

Another publication [5] focuses on the most difficult personnel problems that schools across the country have been recently facing: a large number of teachers think about quitting, take vacations or actually quit; the number of replacement teachers is declining, and fewer educators apply for teaching jobs as teaching is placed among the relatively low-paid careers. All this is happening in the context of the COVID-19 pandemic, when poor and minority students more than ever demand efficient teachers who could help them get back to the classroom more rapidly after the disruptions of the last two years of the pandemic.

The authors of this publication, representing the New Teacher Project organization, consider these problems to be the symptoms of a more serious problem. The current crisis has heightened fundamental questions concerning approaches to staffing schools and the value of teaching as a career. The authors of the publication note that it has been known for decades that the combination of low salaries, limited career opportunities, and challenging work (meeting the diverse needs of an entire class alone) repels talented people from teaching. This trend is only accelerating amid a lack of investment in affordable, high-quality teacher training programs. The authors also emphasize that district governors cannot cope with these long-term problems on their own. The teacher shortage affects every area of American society and the economy as teachers help prepare the next generation of workers for every other industry. Public and private sector governors of all levels should recognize that all that is happening in public education right now is the top priority for developing the country's workforce and act accordingly. The guide elaborated by the New Teacher Project provides insights for community leaders to start in their communities an important conversation about long-term changes in teacher education and the role of the teacher itself, as well as practical tips for covering absenteeism, filling existing vacancies, and addressing chronic teacher shortage exacerbated by the pandemic in key subject areas and in schools serving historically marginalized communities.
Greene in his research [10] has made an attempt to clarify what the problem of the teacher shortage is. He argues that there is no teacher shortage in the US. Hiring and retaining teachers remains a problem due to the lack of attractiveness of the teacher's work. In other words, this is not a staff shortage, but a set of working conditions that force teachers to leave the school. The insufficient level of salary and the low prestige of the profession are considered to be the basic reasons for the teacher shortage. The results of the research demonstrate that staff costs tend to be the biggest expense in school funding; therefore, for those who want to reform schools without spending a lot of money, replacing teachers with computers, guides, or trainers has long been a dream. The arguments in favor of a “teacherless classroom” are referred to as inefficient solutions. The research criticizes officials from a number of states (Idaho, Florida) who argue that teaching does not require trained professionals because “anyone can do it” and who believe that teaching is a patronage job that American veterans or their spouses can do. All of these decisions are based on a stubborn determination to misdiagnose a problem when it requires careful, thoughtful diagnosis.

The research by Boe [9] is also of interest as it provides a model or conceptual framework for identifying teacher shortage in terms of quantity (i.e. gross number of teachers) and quality (i.e. teacher qualifications). An extensive national database of teachers (from kindergarten to grade 12) in the United States of America was used to draw conclusions about the type and extent of teacher shortage. Although there were enough people to fill all teaching positions except for 0.5% of them, there was a serious shortage of teachers who were fully licensed in their specific teaching skills (the shortfall was about 6% of all public school teaching staff). The research results have shown that the shortage of fully licensed teachers was more pronounced among:

1. teachers who had not received teacher training diplomas,
2. novice teachers when applying for a job,
3. hired teachers who had lately changed their place of teaching,
4. teachers of disabled children.

The research by Tran and Smith [11] also reveals the reasons for the teacher shortage in the United States and the wrong solutions to fix the problem.

The research considers strategies to reduce the nation’s teacher shortage, which “remove or relax barriers to entry” to quickly bring new people into the teaching profession, as the wrong ones. California, for example, allows teacher candidates to skip subject matter tests if they have taken approved college courses. New Mexico is replacing subject skills tests with a portfolio to demonstrate teaching competency. Oklahoma has eliminated the General Education Test as a certification requirement. Missouri no longer looks at a prospective teacher's overall grades, and just the ones earned in select courses are required to become a teacher. Alabama has moved to allow some who score below the cutoff scores on teacher certification exams to still get a teacher's license, and Arizona's education requirements for teachers now allow people without a college degree to begin teaching – provided they are currently enrolled in college. All these efforts are focused on recruiting new teachers, mostly by lowering the requirements to make it easier for people to become certified to teach in public schools.

However, according to the authors, these approaches do not address the actual causes of the nationwide teacher shortage. The root cause of the problem, according to a survey of college students and teachers, is a longstanding overall lack of respect for teachers and their craft, which is reflected by decades of low pay, hyperscrunity,
and poor working conditions. Teachers, for example, earn about 20% less than similarly educated professionals. They also faced an escalating workload even before the pandemic placed additional demands on their time, energy, and mental health. In addition, they are regularly exposed to a continued tide of disrespectful student behavior and parental hostility, as highlighted by a survey of 15,000 educators that revealed a growing trend of students verbally and physically harassing teachers, as well as parents engaging in online harassment and parental retaliatory behaviors for teachers.

The authors cite evidence that even before the COVID-19 pandemic hit, teachers were leaving the profession. In the late 1980s, annual teacher turnover was 5.6%, but it has grown to around 8% over the past decade.

The stress of teaching through a pandemic has been speculated to drive away even more teachers. About 1 in 6 teachers expressed that they would like to leave their job pre-pandemic, but this increased to 1 in 4 by the 2020-21 school year. While teachers continue to leave schools, fewer people are signing up to replace them. The authors of the research report that the number of incoming teachers declined from 275,000 in 2010 to under 200,000 in 2020 and is projected to be under 120,000 by 2025.

The authors believe that attempts by a number of states to loosen the requirements for new teachers (in the form of reducing the minimum qualification threshold through skipping basic skills and subject matter tests for teacher certification) will bring more disrespect to the profession. Lowering the standards to allow more people to enter the teaching profession may, for a short period, boost the number of people available to stand in front of classrooms. However, that approach does not make teaching an attractive profession to consider, nor worthwhile for someone to stay and thrive in. Solving the teacher shortage problem requires solutions that reduce the number of teachers leaving the field and specifically address the lack of respect for the teaching profession, low pay, hyperscrunity, and poor working conditions.

Thus, researchers are trying to identify right and wrong strategies for dealing with the teacher shortage problem. The research by Aragon [17] is of interest precisely because of the presentation of time-tested strategies that can have an immediate impact on the teacher shortage problem. State policymakers are invited to use the following five strategies to overcome the staffing problem in schools:

1. Alternative certification;
2. Financial incentives;
3. Introduction and mentorship;
4. Evaluation and feedback;
5. Teacher leadership.

Harmsen et al. [18] also revealed the relationship between the causes of stress for novice teachers, response to stress, pedagogical behavior, and exhaustion.

Kapur [7], noting the seriousness of the problem of severe teacher shortage, also dwells on measures to reduce their high turnover. He identifies four main factors: salaries; working conditions; teacher preparation; mentoring support.

The author considers the salary factor as an important one for teachers in their decision to leave teaching. The results of salary differences in education and other industries are strongest at the start of the teaching career, but the effect of salaries on the retention of teachers in schools persists at higher levels of experience as well.

Working conditions, including professional teaching conditions, contribute an important part in the decisions making to leave teaching in a particular school or district,
and they also contribute to the decisions making to leave the profession completely. National survey data show that teachers' plans to remain in teaching are strongly associated with administrative support, resources, the influence of teachers' opinions on policies in their schools, and compliance with school rules and regulations. It is noted that teachers in more privileged communities experience much more manageable working conditions, including smaller class sizes and lesser workloads, as well as much more control over decision-making in their schools.

An important factor in reducing teacher turnover is their professional preparation. This applies not only to their skills and adequate knowledge regarding the subjects that they are teaching but also to their ability to interact with students and influence classroom teams.

Finally, mentoring in the early years of teaching can retain teachers in schools and enhance the quality of teaching. However, the quality of teacher mentorship programs differs in a wide range. Kapur notes that in the United States of America, a total of 28 states reported that they had some form of a mentoring program for novice teachers, but only ten states supported this requirement with funding.

A solution to the teacher shortage is possible, as evidenced by the experience of high-achieving countries that provide qualified, stable teaching staff in all their schools. An effective teacher support policy, according to Darling-Hammond and Podolsky, includes the following:

- Equitable funding of schools;
- Teacher compensation competitive with other college-educated professions;
- High-quality preparation available at little or no cost to entering teachers;
- Careful recruitment of candidates with the commitment and dispositions for teaching, as well as academic background;
- Readily available support from trained mentors for beginning teachers;
- Allocation of time and support for professional learning and collaboration [19].

State policy plays an important role in overcoming the problem of teacher shortage. According to the Learning Policy Institute, a Washington-based teacher shortage policy think tank, the projected number of teacher retirements and layoffs due to the pandemic and burnout in the coming years will far exceed the declining number of students enrolled in teacher training programs [20]. The results of the study by the institute demonstrated that demand for teachers had outpaced supply by about four times since 2010. More than 270,000 public school teachers will leave the profession between 2016 and 2026, according to government data. A recent survey by the National Union of Teachers has revealed that nearly one in three teachers said COVID-19 made them more likely to retire or retire early.

The same document cites a report by the Center for American Progress, a non-profit organization dedicated to left-wing political research, that between 2010 and 2018, enrollment and overall completion of teacher training programs declined by about one-third. This study revealed that only 160,000 students were enrolled in teacher training programs by 2018.

In order to address the teacher shortage in the United States, President Joe Biden's so-called American Families Plan, which includes USD 9 billion to provide funding to train, equip and diversify the nation's teachers, has been developed. It is in teachers that experts in the field of education see support for saving the economy devastated by the coronavirus. Therefore, the USD 9 billion allocated by Biden's American Families Plan to address the country's growing teacher shortage represents a critical investment for the White House for improving many other aspects of the nation's domestic life.
The allocated money will be used to increase the number of people who study education and want to work in this field, keep existing teachers from leaving the field of this activity, and provide teachers and professionals from other fields with easier and less expensive opportunities to get certification in especially sought-after specialties.

The money offered includes USD 1.6 billion for increasing the number of high-demand educators such as special education and bilingual teachers, as well as USD 2 billion for supporting programs such as mentoring programs for new teachers and so-called teachers of color. In order to address the shortage of teachers of color (about 20% according to the government figures, while students of color make up more than half of all enrolled students), President Biden is proposing another USD 400 million to fund teacher training programs at colleges and universities that have historically been “black”, tribal colleges and universities, and other institutions that serve minorities. The scholarships that will be offered to train teachers of students of color will be critical.

The study by Sykes and Martin [21] analyzes a sample of plans that were submitted by states to the US Department of Education in 2015 in accordance with the requirements of Title I, Part A of the Elementary and Secondary Education Act. The plans were aimed at eliminating inequality in access to qualified teachers in states and districts across the country. A significant amount of research has demonstrated that teachers are distributed inequitably to the detriment of low-income and historically underserved students. Based on the descriptive and logical coding of these plans, the study arrives at several conclusions. First, the federal planning mandate has induced the development of state accounting systems tracking teacher allocations. Second, many of the strategies proposed by the state are not directly related to the problem of teacher shortage elimination. Third, states with highly rated plans are implementing a wide range of targeted strategies to improve the recruitment, support, and retention of teachers in schools serving low-income and underserved students.

Not only American schools are facing the problem of teaching staff shortage. In the research “Teacher Shortages: A Common Problem throughout Europe’s Schools” [6], a team of authors representing different European countries notes that as the new school year begins, there is a teacher shortage across the continent, even in countries with attractive salary ranges.

French schools offer 4,000 teacher vacancies. In Germany, at the beginning of the academic session on August 10, 2022, there were 4,400 vacancies in North Rhine-Westphalia, which is the country’s most populous state. On August 14, 200 vacancies were registered in Schleswig-Holstein. In Berlin, 875 vacancies remained unfilled on the first day of school, August 20.

In Italy, a country whose teaching population has aged considerably, 150,000 vacancies are currently filled by contract teachers. The Swedish National Agency for Education Skolverket predicts that 153,000 teachers will need to be trained by 2035 to compensate for the retirement and career changes of those who are no longer interested in the teaching profession.

Although the British have acknowledged that the crisis has been brewing for a long time, the situation in the UK is no less complicated: a survey by the Association of School and College Leaders, a union of school principals, has revealed that 95% of them have problems hiring teachers, and 72% use replacement teachers to fill positions that should be permanent. Dropout rates are also high: 12% of teachers leave the profession after a year, a third of teachers – after five years, and 40% of teachers – after 10 years.
The teacher shortage negatively affects the quality of teaching. In France, according to the authors of the study, express training sessions are organized for novice teachers just a few days before the start of the school year in order to find contract teachers. Two-thirds of UK school principals use teachers who are not experts in the subject taught, and one-third of them have had to increase class sizes. In Sweden, many teachers are not qualified for the subject matters and courses they teach. In secondary schools, for example, only 83.5% of teachers have the necessary skills. In primary and secondary schools, this figure drops to 71%.

The research by Vega Gil et al. [22] has studied the relationship between territory and education in Spain. The researchers have determined social and political challenges related to the functioning of the education system, in particular the following ones: the working and training conditions of teachers, resources and means, the relationships between the subjects of the state and society, and curricula adjustments. The following ways to respond to challenges have been defined: strengthening relations with the environment (socio-economic and institutional), stability of educational policy, trust and responsibility in education, reinforcement of school and pedagogical autonomy, and the improvement of the training of management teams.

See and Gorard [8] have analyzed in their study the current situation with the teacher shortage in England, and the results of their analysis can be applied to other countries for a better understanding of the causes of teacher shortage and strategies to influence it.

The study concludes that the demand and supply of teachers are influenced not by one, but by a number of factors, such as changes in the birth rate and the economic context (the relative attractiveness of salaries and working conditions for teachers), as well as the supply of graduates in general, changes in educational policy and organizational structure of the school (for example, maximum class sizes or the opening of new small schools). The interaction between these factors can be complex, in particular, some of these factors act against each other. Declining class sizes, for example, increase the demand for teachers, while education policies that raise tuition fees at higher education institutions can limit the supply.

Therefore, a long-term approach to teacher supply planning is needed, as well as the implementation of public policies considering a complex of factors and their interaction in order to influence the cause of the problem, and not its symptoms.

As shown above, the results of international studies suggest that the declining prestige of the teaching profession coupled with an unsatisfactory work environment is the predominant cause of teacher turnover. The studies performed have identified some work environment factors that ensure teacher quality: adequate resources, a manageable workload, collegial collaboration, opportunities for professional development, management board support, and opportunities for decision-making.

The study by Yot-Domínguez and Marcelo [23] focuses on modern strategies for the professional development of teachers in the information society. The study proposes an efficient toolkit developed by the authors, which includes the following components: online and offline consultations, formal education (courses, seminars), peer-to-peer learning (peer-to-peer education), exchange of ideas and problems, participation in the activities of an educational organization, joint activity, experimentation, and reflection. According to the authors, in modern conditions, non-formal and informal education in the framework of professional development is more efficient than formal one due to the characteristics of flexibility, autonomy, and developing potential.
At the same time, little attention has been paid to the study of the relationship between the school working environment and the satisfaction of the teacher with the work. In this regard, of interest is the study by Toropova et al. [15], which revealed the relationship between school working conditions and teacher characteristics, on the one hand, and satisfaction with the work of the eighth-grade mathematics teachers in Sweden, on the other hand. Among the aspects of working conditions at school, the most important for teacher job satisfaction were the following ones: teacher workload, teacher cooperation, and student discipline. Female teachers, teachers with more professional development experience, and more efficient teachers tended to have higher levels of job satisfaction. For male teachers, the cooperation of teachers mattered much more. School discipline perception was critical to the job satisfaction of the least efficient teachers.

Identifying working conditions that contribute to teacher job satisfaction is important for informing school administrators about aspects of the school work environment that need improvement, thereby promoting teacher retention.

Researchers from Ethiopia also highlighted gender aspects of the problem of teacher shortage. Nketsia et al. [24] studied the retention factors of young Ethiopian educators who graduated from elite teacher training institutions based on Mason and Matas’ four-capital model (structural, social, psychological, and human capital). The results of the study showed a positive relationship between four interrelated indicators of teacher retention. Other input variables, such as gender, pre-service training, professional development, teaching level, and living with family in the community, provided additional insight into teacher retention. The authors note the importance of pre-service training, better working conditions, regular access to professional development, and school-level support to enable beginning teachers to be satisfied with their professional activities and stay in the profession. The necessity of considering gender aspects by education authorities in the organization of professional training or formulation of policies for teacher retention is revealed. It is clear to the authors of the study that various factors can influence the decision of male or female teachers to either leave or stay in the profession.

The prospect of using Mason and Matos’ complex model of teacher attrition and retention is also shown in the study by Karalis Noel and Finocchio [25]. The model allows considering different groups of criteria when designing approaches to retain teachers:

- human capital: the quality and nature of pre-service education; professional skills and knowledge; opportunities for and relevance of continuing professional development;
- social capital: the quality of relationships with members of the school community, the presence and quality of leadership; school culture, presence, quality, and nature of informal/formal support; the value of teachers and teaching;
- structural capital: the nature and complexity of the work; employment conditions, structure, and pathways; state and regional departmental policies; school resources and facilities;
- psychological capital: personality and psychological factors.

In many foreign studies, it is emphasized that the teacher shortage provokes deterioration in the education quality, which causes concern among all interested parties in the field of education. The joint search for management approaches to solving a problem that is international in nature is relevant.

The situation with the teaching staff shortage in the regions of the Russian Federation should be analyzed according to statistical observations and on the basis of publications in scientific journals.
According to the federal statistical observation in 2021 in the Orenburg Region, where the project “Comparative analysis of the efficiency of various approaches to improving the quality of schools with poor educational results” is being implemented, 872 educational organizations provided training in basic general education programs. Of these, 215 schools were in urban areas, and 657 – in rural areas [26].

Schools in rural areas tend to experience more problems with the provision of material resources and personnel. The low level of school provision represented by outdated equipment, the insufficient level of provision with computers and software, other modern teaching aids, low Internet speed; the insufficient level of equipment for the implementation of the requirements of the Federal State Educational Standard, the organization of educational, sports and recreational work and additional education, and other resource shortages lead to an inequality of educational opportunities in rural and urban schools. Rural schools are particularly characterized by a teaching staff shortage, although urban schools also face this problem.

Shapovalov notes that “at present, there is no holistic, scientifically based analysis of the representation of teaching staff in the labor market at the regional level, in the context of the territorial development of the Russian Federation” [12, p. 121]. In this regard, the materials of the project “All-Russian Interregional Study on the Representation of Pedagogical Education in 85 Regions” are considered to be relevant. This study defines informative indicators of the teaching staff state in the regions, including the following ones:

- Provision of preschool education institutions with educators (the number of pupils per educator; the number of educators per preschool education institution);
- The number of students per teacher in general education institutions;
- Availability of teaching vacancies and their correlation with the number of state-funded places in the universities of the region;
- The relationship between the number of teaching staff per pupil and the average salary of teachers.

The educational monitoring of teaching staff in the Volga Federal District conducted in 2021 has shown that along with the Republic of Bashkortostan (521 vacancies) and the Samara Region (485 vacancies), one of the most problematic regions with a teaching staff shortage was the Orenburg Region (403 vacancies) [12].

The current appeal to the Interactive Portal of the Employment Service of the population of the Orenburg Region reveals 342 teacher vacancies and 367 vacant positions. Among the vacant positions are teachers in the following disciplines: Foreign (English/German) Language; Maths; the Russian Language and Literature; Biology, Chemistry; History, Physics, etc. [13].

The author of this study considers the following reasons for the disproportion in the quality of teacher education in various regions of Russia: the abolition of the state distribution of university graduates; unstable demand for university graduates; commercialization of education; reduction of funding from the state budget for educational and scientific activities; a limited perspective vision of the development of the teaching staff market in the context of rapid changes. The study concludes that it is necessary to reinforce the regulatory impact of the state on the labor market in order to eliminate the imbalance associated with the lack of professional teaching staff.

The “Report on the Results of the Implementation of the State Program “Development of the Education System of the Orenburg Region” for the First Half of 2022” provides the following data on the human resource of the general education system in the region:
more than 16.4 thousand teachers with 87% of them having qualification categories. The proportion of the number of teachers under the age of 35 in the total number of teachers in general education organizations is 25.2% [14].

Thus, such a factor (cause) of the problem with staffing is revealed as a lack of young teachers, including in schools in settlements with a population of up to 50 thousand people, where university graduates do not seek to move due to the lack of infrastructure, decent social conditions, low salaries, and poor living standards in general.

According to many authors, this problem should be solved based on the active actions of the state as an institution for managing the education system in rural settlements and municipalities. The implementation of the Zemsky Teacher program, which was launched by the Government of the Russian Federation on behalf of the President on January 1, 2020, should help create favorable conditions for young professionals with a view to their employment in educational organizations in the countryside. This program implies a lump-sum payment, an “installation grant” in the amount of RUB 1 million, to teachers for moving to rural settlements, villages, and small towns of up to 50 thousand people. This payment can be used for paying off a mortgage, buying a house or the necessary materials for building a home. It is assumed that financial assistance for teachers in the amount of RUB 1 million under the Zemsky Teacher program will be provided to residents of all regions of Russia on the following conditions: higher professional education; moving to the countryside; conclusion of an agreement with the school management for at least 5 years; age up to 55 years [27].

In 2020, 34 vacancies were filled in the Orenburg Region as part of the Zemsky Teacher program. In September 2021, 32 teachers started working (one took leave to care for a child under 3 years old). Competitive selection under the program in 2021 was not carried out due to the lack of federal co-financing for these purposes.

Since the beginning of 2022, a new competitive selection has started in the Orenburg Region, as a result of which, by September 1, 2022, 28 vacancies were filled in educational organizations implementing programs of primary general, basic general, secondary general education, in settlements with a population of up to 50 thousand people in 21 districts of the region.

The problem of the influx of specialists in sparsely populated areas can be solved by means of other options as well. In order to secure young specialists, the municipal educational authorities in the Orenburg Region pay attention to the accommodation of young specialists, the creation of favorable conditions for their professional growth, and the solution of social and domestic issues. When applying for a job in 2020, 4 young professionals (0.9%) were provided with tied apartments, 7 teachers (1.6%) were placed in dormitories, 67 people (15.4%) lived in private apartments under a housing rental agreement with partial payment, 141 people (32.4%) lived with their parents, and 216 young professionals (49.6%) provided themselves with housing on their own.

For attracting young professionals to schools in 34 municipalities of the Orenburg Region in the 2020/2021 academic year, “installation grants” were paid, incentive payments were made, as well as monthly supplemental payments from RUB 500 to RUB 4,000 and one-time financial aid to young professionals in the amount of up to RUB 5,000 [14].

The above-mentioned programs do not exhaust measures aimed at attracting teachers to work in rural areas.

A number of authors propose to use for this purpose the mechanism of powerful material incentives implying the provision of dwelling space. Burenina and Yatsyk outline in their study a motivational model for attracting specialists to a rural school, which
implies the conclusion of a contract and the provision of residential premises for official use with the possibility of subsequent privatization under certain conditions [28]. The authors propose to fix the following stages in the formation of the “System of Staffing in Rural Schools” in the state program:

1. The initial stage is the formation of municipal housing stock in rural settlements through the construction of new apartment buildings, considering the required number of residential premises for future teachers and their families. For this purposes, municipalities should be provided with subsidies from the regional or federal budgets.

2. An intermediate stage is the conclusion of agreements between the regional universities and the municipalities of rural settlements on the issue of employment of graduates, the definition of a model for future contracts.

3. The final stage is the creation of an established mechanism for ensuring the personnel component of rural schools.

The proposed approach to the development of a mechanism for solving the staff shortage problem in rural schools of the Republic of Crimea can be tested in other regions interested in finding innovative ways to address staff shortage issues.

The lack of young teachers is associated to a certain extent with the random, situational self-determination of a part of applicants for teacher training universities and colleges; this reduces the proportion of graduates of secondary vocational and higher education employed by type of activity and acquired competencies.

It is possible to influence the increase in the number of motivated applicants for teacher training universities and colleges, as well as the formation of a community of schoolchildren focused on the choice of teaching professions, through the organization of specialized psychological and pedagogical classes.

In the Orenburg Region, there are 28 specialized psychological and pedagogical classes. To expand their network (up to 40 classes in 2023 and up to 73 classes in 2024), a joint action plan was developed by the Ministry of Education of the Orenburg Region and the Federal State Budgetary Educational Institution of Higher Education “Orenburg State Pedagogical University” [14].

However, young teachers should not only be attracted to the schools but also retained there. Therefore, it is necessary to improve not only the selection of applicants but also the entire system of teacher training, including their quality basic education, ongoing support for novice teachers, as well as the creation of conditions for subsequent professional growth throughout the entire teaching activity.

Currently, there are state programs to support teaching staff (including young teachers). A national system of professional development of teachers was introduced in accordance with the National project “Education” in order to implement the Decree of the President of the Russian Federation V.V. Putin “On the National Goals and Strategic Objectives of the Development of the Russian Federation for the Period up to 2024” [29]. It is assumed that by the end of 2024, 70% of teachers under the age of 35 will be involved in various forms of support and maintenance in the first three years of work. At least 50% of teachers in the general education system will improve their professional skills by means of continuing education formats (by the end of 2024) [14].

At the same time, the problem with the availability of teaching staff is still relevant and necessitates the search for innovative ways to address the staff shortage in schools.

The studies by Tegentsev [30] and Duma [31], for example, propose the following alternative measures to solve the problem:
• Getting students of teacher training universities and teachers to know about the possibilities of social payments when working in schools.

• Accreditation of professional retraining institutions for the right to issue primary, basic, and upper secondary school diplomas to persons with higher education.

• Popularization of the teaching profession using the following forms: organization of seminars of young teachers for university students; meetings of experienced teachers with students; organization of professional competitions such as “I Am a Future Teacher”, etc. not only for employed teachers but also for students.

Important roles in solving the personnel problems of municipal educational systems play not only universities but also teacher training colleges. This happens, according to Kopylov, largely due to the fact that a more efficient system of work on the distribution of graduates in the field of education has been established in institutions of secondary vocational education. The study reveals the experience of providing the regional teacher labor market with competent mid-level specialists with a high level of academic and social mobility (through the example of the Vologda Region) [32].

This task is also relevant for the Orenburg Region, where at the end of June 2022, 58.7% of graduates of secondary vocational education institutions were employed. In order to achieve in 2022 the necessary value of the indicator “The share of graduates of educational organizations implementing programs of secondary vocational education, employed by type of activity and acquired competencies” (plan – 62.5%) of the federal project “Young professionals (Increasing the competitiveness of vocational education)”, a complex of measures was developed for the employment of graduates in the Orenburg Region, including interdepartmental interaction between the Ministries of Education, Health, Sports, Culture with the Ministry of Labor and Employment of the Orenburg Region (on the formation of a job bank for citizens with secondary vocational education); interaction with the Orenburg Union of Industrialists and Entrepreneurs, with the Chamber of Commerce and Industry of the Orenburg Region (in terms of forming a list of needs of enterprises/organizations in qualified personnel); with the Employment Centers of the Orenburg Region (in terms of registering graduates being at risk of non-employment); with the heads of institutions of secondary vocational education in the course of weekly monitoring of the employment of graduates, etc. [14].

Kopylov notes that there is an urgent need for closer interaction between secondary vocational education organizations and regional universities to ensure the possibility of accelerated training of college graduates in bachelor’s degree programs, while taking into account the mastered general professional disciplines and a significant amount of teaching practice. The organizational mechanism in this interaction can be an intermunicipal council for personnel training with the participation of professional educational organizations for teacher training, educational authorities, basic schools, and certification centers [32].

Finally, while facing a lack of material resources and personnel, especially in rural schools, it is advisable to introduce network interaction of educational organizations, including using elements of the digital educational environment.

According to Article 15 of the Federal Law “On Education in the Russian Federation”, the network form provides the opportunity for students to master the educational program using the resources of several organizations engaged in educational activities, and also, if necessary, using the resources of other organizations [33].

Along with the terms “network form”, “networked learning”, the concepts of “network model”, “network partnership (cooperation)”, “network interaction”, etc. are used.
The model of networked learning began to be widely used in the 2000s in connection with the adoption of the Concept of subject-specific teaching at the senior level of general education [34].

Subject-specific teaching is one of the priority areas for the modernization of Russian education and is designed to ensure the individualization of education, while taking into account the interests, needs, and abilities of students; to create conditions for successful professional self-determination of students, their socialization and early adaptation in the labor market. The concept allows using various forms of subject-specific education in a general education school, such as the intraschool subject-specific education model and the model of network organization of subject-specific education.

The main goal of the network organization of education is to ensure equal access to quality education while implementing basic and additional general education programs; creation of additional, missing conditions (resources), especially in a rural school with its inherent features: remote location, lack of transport accessibility, underdevelopment of the municipal educational network, insufficient filling of senior classes, lack of the possibility of organizing variable extracurricular activities, etc.

The Concept of subject-specific education offers the following options for its network organization:

1. association of several general education organizations around the strongest general education organization having sufficient material and human potential and acting as a “resource center”. In this situation of partnership, each general education organization implements a part of subject-specific training within its capabilities. The rest of the subject-specific training is taken over by the “resource center”;

2. interaction of an educational organization with institutions of additional, higher, and secondary vocational education for attracting additional educational resources. Hereewith, the students are able to gain knowledge in the chosen subject not only at their school but also in educational structures cooperating with the general education organization (through distance courses, correspondence schools, etc.).

The ultimate goal of network interaction is the implementation of educational programs of subject-specific training in the conditions of the division of duties and the exchange of resources between network partners in order to meet the educational needs of students.

In order to further develop the provisions of the founders of subject-specific education, including on the basis of the network form of its organization [35; 36], modern researchers propose new variants of network organization models of subject-specific education: the creation of educational clusters [37]; building an integrative model of school network partnership [38]; creation of a single information and educational space in the conditions of network interaction between educational and other organizations [39], etc.

However, the development of organizational and managerial aspects of the network partnership implementation remains relevant; as well as normative regulation of relations developing between social partners; distribution of functions and powers between all participants in the educational process; development of an efficient management model; determination of criteria for the progress and efficiency evaluation of the subject-specific network.

The research by Melnik and Andreyeva [38] demonstrates the designed integrative model of network interaction of the lyceum, in which not only educational organizations of the municipality and teachers of the lyceum but also parents and students act as
objects of network interaction and management. The research highlights the developed principles of network interaction (the pedagogical process management; continuity and integration of levels and stages of network partnership), its forms (network educational project, network educational event, network educational program), organizational and pedagogical conditions for the network model implementation (preparation and training of teaching staff for implementation of subject-specific education, development of educational and methodological materials, development and implementation of efficient forms of cooperation between the school and various types of social partners, psychological and pedagogical support of subject-specific education). The proposed criteria for the efficiency evaluation of network partnerships will be useful for heads of educational organizations implementing a network model of education:

- continuous development of social partnership by means of expanding the range of educational services aimed at the implementation of subject-specific education;
- the degree of modernization of the content, forms, and means of the educational process;
- the number of newly attracted social partners;
- the level of satisfaction with the quality of education of the subjects of the educational process;
- education quality reinforcement (according to internal and external evaluations, based on the results of students’ participation in competitions and olympiads);
- the number of admissions of school graduates in the organizations of secondary vocational education and higher education in the chosen subject matter;
- creation of new network interaction projects by teachers, etc.

Network partnership is an important tool for ensuring accessibility and quality of modern education, since it allows designing other significant functions of the education system – not only the organization of subject-specific education but also the implementation of inclusive education.

The advantages of the network form of implementation of educational programs were used by Saitbayeva and Ismailova in a pilot study of the implementation of inclusive education for children with disabilities by way of pooling the resources of five rural schools in the Saraktash District of the Orenburg Region (where Petrovsky secondary school was the resource school, and the other schools acted as partner schools) [40].

The expediency of using the network model of education was due to the contradiction between the need to move to inclusive education for ensuring the quality and accessibility of education for children with disabilities, on the one hand, and the insufficient resource readiness of educational organizations (especially in rural areas) for this, on the other hand. Rural schools, as a rule, do not have the opportunity to educate and teach children with special educational needs in a quality manner due to a lack of qualified personnel, equipment, budget (as a result of per capita funding), and other reasons. The low level of resources and the unpreparedness of the educational environment affect the well-being of children with disabilities and their educational opportunities. Meanwhile, the number of children with disabilities is constantly growing, and they need special conditions to prepare for independent living.

The study demonstrates the developed management model for the inclusive education implementation based on the networking of rural schools; determines the conditions for its implementation (motivational, personnel, regulatory, scientific, educational, methodological, informational, logistical, financial, and economic), which were tested during
the relevant project implementation. The results of studying the professional readiness of teachers before and after the experiment were described and confirmed the efficiency of the developed conditions. The main risks that hindered the achievement of positive results in providing affordable and high-quality education for students with disabilities based on the use of a network form of implementing educational programs were identified, and ways to prevent them were outlined.

Discussion

The conducted analysis shows that the problem of teacher shortage is real and has a long-term character.

While foreign researchers determine the demographic situation, economic context (salaries and working conditions of teachers) [9; 11], and educational policy (increasing tuition fees in higher education institutions) [11] as the reason for the high level of annual staff turnover, the Russian researchers, along with the shortcomings of the state’s regulatory impact on the labor market (abolition of the state distribution of university graduates; commercialization of education; reduction in funding from the state budget for educational activities; a limited perspective vision of the development of the teaching staff market) [14] note such important factors as the situational self-determination of some applicants for teacher training universities and colleges, as well as the lack of support for novice teachers and the stagnation of the professional development of experienced teachers [41].

Russian researchers share the alarming observation of foreign authors [5] that the teacher shortage provokes deterioration in the quality of education, which causes concern among all interested parties in the field of education.

The relationship between the teaching staff shortage and the low educational results of students has also been revealed by Russian researchers. Since 2020, the Federal Institute for Evaluation of Education Quality has been implementing a project to organize methodological support for general education organizations with low educational results for students. Among the key objectives of the project is a comprehensive diagnosis of factors (causes) affecting the quality of education in educational institutions; development of efficient measures of methodological support for each educational organization; project progress monitoring and performance evaluation. The “Methodology for Providing Targeted Assistance to Organizations with Low Educational Results” [42] states that the general approach to solving the problem of providing support to schools will be the involvement of regional executive authorities. In addition, it is planned to use the resources and programs of the National project “Education” [43].

The authors of this study agree with Tran and Smith [11] arguing that attempts by a number of US states to address the teacher shortage by means of lowering the cutoff scores on teacher certification exams will cause even greater disrespect for the teaching profession. Such an approach can only increase the number of teachers for a short period, but will not make the teaching profession attractive.

Foreign experience allows identifying the following efficient strategies: alternative certification; financial incentives; introduction to teaching and mentoring; assessment and feedback; support by teacher leadership [17]. This is also stated in the research by Kapur [7], who argues that teachers’ plans to continue teaching are closely related to administrative
support, the resources of an educational institution, the influence of teachers' opinions on politics in their schools, and compliance with norms and rules in schools. According to Kapur [7], an important factor in reducing teacher turnover is their subject matter, as well as psychological and pedagogical professional training. Russian researchers come to the same conclusions. Both foreign and Russian researchers agree that a multifaceted approach is needed to attract and retain teachers in the profession.

This position is quite consistent with the positive assessment of the role of the mechanism of public-state regulation of the teaching staff shortage. Based on the analysis of statistical data and reports of regional education authorities [14], as well as publications in Russian sources, including the publications by the authors of this study, an integrated approach to solving the problem of overcoming the teaching staff shortage has been defined including the following aspects:

- Increasing the number of motivated applicants for teacher training universities and colleges and the formation of a community of schoolchildren focused on the choice of teacher training professions (through specialized psychological and pedagogical classes) [14].

- Improving the teacher training system, which should include not only non-random selection of applicants and their quality basic education but also constant support for novice teachers, as well as the creation of conditions for subsequent professional development throughout the teaching career [14; 29].

- Creation of favorable conditions by municipal educational authorities for the purpose of employment and retention of young professionals [20], including through the implementation of the Zemsky Teacher program [14; 27].

- Retraining, including retraining of existing teachers; retraining of specialists with non-subject-specific higher education in teacher training programs [30; 31].

- Introduction of network interaction for the implementation of subject-specific training [35; 36], including based on the creation of educational clusters [37], an integrative model of school network partnership [38], using elements of the digital educational environment [39]; for the implementation of inclusive education in a situation of shortage of specialists [40].

- Information and educational activities about social guarantees for teachers and promotion of the teaching profession prestige, which will increase, including with an increase in the salary of a teacher [30; 31].

### Conclusion

The conducted analysis shows that the problem of teacher shortage is real, large, and has a long-term character. Foreign authors link the teacher shortage and the decline in indicators of the quality profile of teachers (certification, appropriate training, experience, etc.) and conclude that the teacher shortage harms students, teachers, and the public education system as a whole. Lack of well-qualified teachers and teaching staff instability threaten students' ability to learn and reduce teacher efficiency, and high employee turnover consumes economic resources that could be better used in other industries. The teacher shortage makes it difficult for teachers to build a solid reputation and further professionalize, which
later contributes to the persistence of the shortage. In addition, the teacher shortage is distributed unevenly among students of different socio-economic backgrounds, which challenges the education system to provide quality education equally to all children. Addressing the working conditions and other factors that encourage teachers to leave is determined as a solution to the problem: low salaries, complicated school environments, and weak support for professional development and recognition.

Russian publications identify the factors (reasons) of the teaching staff shortage and management decisions aimed at counteracting these factors.

Insufficient provision of schools, especially in rural areas, with teaching staff is manifested in the following: the absence of specialists (psychologists, speech therapists, speech pathologists, social pedagogues); lack of teachers in specific academic subjects; lack of young teachers; staff turnover, etc. University graduates do not tend to move to settlements with a population of up to 50 thousand people due to the lack of infrastructure, decent social conditions, low salaries, and low living standards in general. Random situational self-determination of some applicants of teacher training universities and colleges also reduces the proportion of graduates of educational institutions of secondary vocational education and higher education, employed by type of activity and acquired competencies.

Resource deficits lead to the inequality of educational opportunities in rural and urban schools. In this regard, there is a growing need to strengthen the regulatory impact of the state on the labor market for eliminating the imbalance associated with the lack of professional teaching staff.

The study has identified efficient management approaches to eliminate the teaching staff shortage (improving the teacher training system, which should include a non-random selection of applicants, high-quality basic education, and constant support for novice and experienced teachers; creating favorable conditions for retaining young professionals; introducing networking; increasing teacher salary, etc.); the need for an integrated approach to solving the problem has been revealed.

It has been concluded and theoretically justified that the implementation of only state programs and the involvement of regional and municipal executive authorities will not solve the problem. It is necessary to consolidate the efforts (interdepartmental interaction) of all social partners interested in the career guidance of schoolchildren, the preparation of students, and the continuous education of teachers.

The work to overcome the personnel shortages in the national school creates the prerequisites for the education system to fulfill its modernization function, leading to the more efficient development of the Russian state.

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