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- Papers on current projects, practical developments and policy debates in the field of education, written for professionals and the wider public
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Russian Education at the Threshold of a New Stage of Evolution

(Foreword to a set of publications)

In 2016, the Center for Strategic Development (CSD) embarked upon designing the Strategy for Socioeconomic Development of Russia up to 2024 with an outlook to 2035 under the auspices of Alexei Kudrin, as instructed by the President of the Russian Federation. The project involved setting up working parties on various domains including education. Yaroslav Kuzminov was assigned to supervise the CSD Council's Working Party on Education and Isak Froumin became its coordinator.

All of the working parties were asked to elaborate on how their sectors could contribute more to economic growth and social development instead of trying to solve routine internal problems.

This focus became a major challenge for the Working Party on Education. Strategic development in this domain has lately sought to solve the problems that have accumulated. The new formulation necessitated a serious discussion on the possible contribution that education can make to economic growth and social transformations and on the system development mechanisms.

The key areas of socioeconomic growth in which the contribution of education may become decisive include the following:

- Economic development through increasing labor productivity
- Technology modernization
- Social stability and improvement of living conditions
- The country's standing in global rankings

Without downplaying the importance of drawing from global best practices, we nevertheless believe that the specific Russian context requires finding unique solutions, in particular, concerning the question on how to “enrich” the contribution of education.

Indeed, Russia has a huge educational potential, mostly inherited from the Soviet Union. The achievements made in education development in 2000–2017 facilitate the use of this sector as a driver of economic growth. According to The Global Human Capital Report 2017 issued by the World Economic Forum in September 2017¹, Rus-

¹ <https://www.weforum.org/reports/the-global-human-capital-report-2017>

sia is ranked 4th in the world on the human capital “capacity” sub-index (which is largely measured through formal education attainment rates). At the same time, the country ranks as low as 42nd on the human capital “know-how” sub-index (capturing real-life application of skills at workplace). Particularly illustrative is the ranking of 89th position on the “availability of skilled employees” indicator.

That is to say, the existing educational potential has not been capitalized on enough or involved fully in economic growth.

It must also be acknowledged that Russia, while boasting one of the highest proportions of engineering graduates, is not leading the way in technology or high-tech manufacturing.

While providing quite a high level of accessibility, the education system has not become an effective mechanism for social mobility, which creates risks not only for groups with low socioeconomic status but also for the social stability of society as a whole.

From the perspective of global standing and competition, the Russian education system is becoming less powerful, yet it could contribute much more to the spread of Russian culture and in attracting talent from the international field.

For this reason, the transition to the new role of education in the country’s development will require considerable changes to the existing education system, including in areas that appear to be quite well-off today. This is the only way to turn expenditure on education into high-yield investment in the future instead of just approaching it as a social obligation.

In order to analyze the education system’s potential for solving socioeconomic development problems, the CSD’s Working Party on Education explored existing trends as well as looking into possible effects of various development scenarios.

This issue of *Voprosy obrazovaniya / Educational Studies Moscow* launches a series of articles presenting the findings of this research, which form the basis for further discussion on the future of Russian education and strategic development in this field.

*The Center for Strategic
Development’s Working Party
on Education*

Educational Attainment and Social Inequality in Russia: Dynamics and Correlations with Education Policies

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Abstract. Dynamics of academic performance of Russian school students depending on cultural capital and the size of community is analyzed using PISA and TIMSS data. In order to reveal tendencies in TIMSS and PISA scores dynamics ten educational experts were interviewed. The last 15 years have witnessed a slight improvement in performance of Russian school students and a drop in social and territorial inequality. These changes do not affect all subject areas and result from educational attainment improvements in small populated localities and social groups of low cultural capital. Meanwhile, no growth has been observed in the scores of students with higher levels of cultural capital. The interviews shed light on possible changes in the education system associated with the dynamics of school students' educational attainment.

Keywords: school, territorial inequality, social inequality, education quality, TIMSS, PISA.

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Equality of educational opportunities for different social groups is recognized today as an important indicator of the quality of education systems [Field, Kuczera, Pont 2007]. Educational inequality in Russia is an acute social problem. However, this is not something that has emerged recently. Research shows that, despite the dominant Soviet discourse, access to education varied widely across social groups,

with universities being mainly accessible to children from privileged families [Konstantinovskiy 2008].

International studies, such as TIMSS¹ and PISA², are key data sources for analysis of educational inequality today. Education policy experts have attended to Russia's results in such studies over the recent years, but their focus has rather been on the country's mean scores and standing in the rankings than on inequality issues. This interest has been caused by contradictory results: while performing pretty well in TIMSS, Russian school students' score is below PISA average [Kovaleva et al. 2004]. These two studies operationalize educational outcomes in different ways: TIMSS keeps very close to the content of school curriculum, whereas PISA focuses on students' ability to apply school knowledge in solving real-life problems. Researchers have traditionally explained the low scores of Russian students by the fact that Russian schools are not oriented at developing competencies assessed by PISA [Kasprzhak et al. 2005]. They associate improvements in overall education quality with the need to achieve high mean scores in both international assessments [Bolotov et al. 2013; Carnoy, Khavenson, Ivanova 2015].

However, it would be rather inappropriate to make educational policy decisions based on the scores of the average Russian school student. According to recent studies, academic performance differs for students with different social backgrounds. In particular, better results are obtained by students from families with greater cultural capital [Konstantinovskiy 2010; Carnoy, Khavenson, Ivanova 2015] and those living in the major cities [Konstantinovskiy et al. 2006; Amini, Nivorozhkin 2015]. Professional teacher characteristics and teaching methods correlate differently with the educational outcomes of such children and those of their peers from families with lower cultural capital [Carnoy et al. 2016]. It means that universal reforms seeking to embrace all students at once may be inefficient in the Russian education system.

Therefore, the quality of education should be improved by developing a set of differentiated measures for students from different groups and focusing on decreasing inequality in educational opportunities. However, Russia's current education policy makes no allowance for the problem of inequality [Kosaretsky, Grunicheva, Goshin

¹ TIMSS, Trends in Mathematics and Science Study, is a series of international assessments conducted every four years in 4th and 8th grades since 1995. It includes tests in mathematics and science as well as questionnaires for students, teachers and school administrators: <http://timss.bc.edu>.

² PISA, Programme for International Student Assessment, is a worldwide study of 15-year-old students' performance conducted every three years since 2000. It includes tests in mathematics, science and reading as well as questionnaires for students, teachers and school administrators: <http://www.oecd.org/pisa>.

2016]. Besides, while official documents declare certain changes designed to enhance Russia's standing in international assessments, expert evaluations prove that such changes are implemented very poorly in practice [Bolotov et al. 2013]. The dynamics and extent of inequality in the educational outcomes of students from different social backgrounds need to be analyzed in the first place to change the situation and develop a set of differentiated measures.

This study aims to trace the dynamics of TIMSS and PISA performance of Russian school students grouped by their family's cultural capital and the type of locality they live in as well as to identify the relationship between these dynamics and the changes in education policies.

A mixed method research design is used in the study. Analysis of PISA and TIMSS data was complemented by a series of interviews with experts who were asked to explain possible causes of the tendencies revealed. Ten interviews were conducted with educationalists who are experts in the design of the Unified State Examination (USE) and other education quality assessment tools or who worked for the Ministry of Education and Science at different times, as well as instructional coordinators and school principals.

The study used TIMSS 8th grade mathematics and science data and PISA³ reading, mathematics and science results for 2003–2015. Only school students' results were sampled from PISA data in this study⁴. TIMSS and PISA results are assessed on a scale from 0 to 1,000 with the mean of 500 and standard deviation of 100. The rating scale is divided into 5 (TIMSS) or 6 (PISA) proficiency levels indicating the level of literacy in mathematics, science and reading attained. Both assessments use baseline levels (Level 2), which correspond to minimum skills required in adult life. Students below Level 2 are regarded as unable to apply basic information skills and thus likely to have difficulties in further learning or their career. Level 5 indicates that students are ready to act in unknown situations and apply complex analysis skills.

Students were grouped by location and cultural capital for the purpose of comparison. In keeping with Pierre Bourdieu [Bourdieu 2011], this study uses the mother's education level (whether college completed or not) as an indicator of cultural capital⁵. Regional inequalities

³ TIMSS and PISA samples are representative for Russia. Each cycle involved about 5,000 school students.

⁴ Vocational students are in a different educational situation, and their number is progressively decreasing: from 19% of the total sample in 2003 to 4% in 2012 and 2015.

⁵ The PISA's consolidated socioeconomic status index is inapplicable because the Russian education system is hard to fit into the international classification which is used since PISA-2009. Students' answers about their mother's vocational education are encoded as level ISCED5B, which corresponds to

were assessed by grouping students based on the population size of their school locality.

The article will further describe the analysis results, i. e. the dynamics of Russian students' TIMSS and PISA scores in general and across groups with different cultural capital and size of populated locality. Possible causes of the tendencies revealed are identified based on a series of interviews with experts. Conclusion and discussion make up the final part of the article.

1. The dynamics of Russian school students' TIMSS and PISA performance

Russian students showed overall good knowledge of what they had learned in school (TIMSS) but a low ability to apply this knowledge in real life (Fig. 1) throughout the whole period analyzed. The dynamics of results varies depending on the study and domain examined.

TIMSS math scores were growing in 2003–2011, but then a long-drawn-out stagnation followed. In contrast, PISA performance grew better in 2009–2015 after statistically insignificant fluctuations in 2003–2009. The overall improvement in mathematical performance was lower in the PISA than in the TIMSS in the 2000s.

The dynamics in science has been more dramatic. TIMSS science scores had increased sharply by 2011 and changed very little after that. Meanwhile, the PISA performance was getting worse in 2003–2009, which was followed by an insignificant improvement, yet the 2003 level had never been reached again by 2015.

Reading scores were increasing up to 2015 after a slight decrease in 2003–2006. It is in reading that Russian students have had the greatest progress. While there were essential disparities between the domains, and reading literacy tests presented the most difficulty for Russian students in 2003–2006, the gaps had shrunk to a minimum by 2015, when reading literacy of Russian school students, associated with their information skills, reached the levels of literacy in mathematics and science.

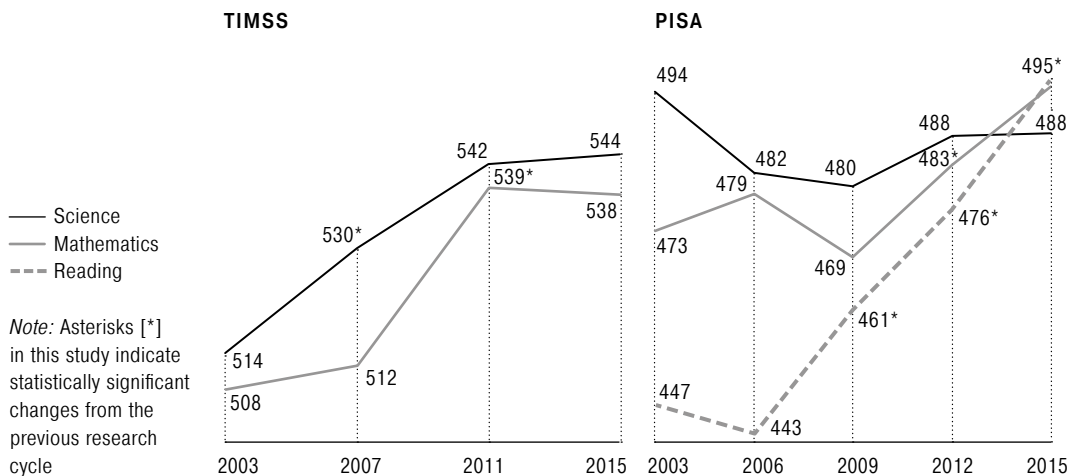
2. Inequality of educational outcomes related to cultural capital

Students with college-educated mothers⁶ tend to perform worse in all domains (Fig. 2 and 3) in both TIMSS and PISA. However, the dynamics of scores obtained by students from families with different levels of cultural capital varies between the studies and across the domains.

tertiary education in the consolidated index. However, trade schools and vocational colleges represent independent levels of education in Russia.

⁶ The proportion of students with college-educated mothers increased consistently in the TIMSS sample, from 36% in 2003 to 46% in 2011, falling to 42% in 2015. As for the PISA sample, the respective proportion changed very little in 2003–2009, hovering around 35%. In 2009–2015, however, it grew by 16%.

Figure 1. **The dynamics of Russian students' TIMSS and PISA performance, 2003–2015**



TIMSS math scores changed similarly in both groups: sharp increases in 2007 and 2011 were followed by periods of stagnation. Meanwhile, the dynamics in PISA math performance differed between the groups with varying cultural capital. Students with college-educated mothers performed almost the same all the time (with the exception of a small improvement between 2009 and 2012), whereas the performance of students with non-college-educated mothers started growing in 2010.

The same dynamics, with identical changes in TIMSS results and small yet differing changes in PISA scores, is revealed in science performance. Both groups showed a gradual improvement in TIMSS, which had slowed down by 2015. PISA performance had worsened by 2006 and went back to the first cycle values in 2012 among students with college-educated mothers. Their peers with non-college-educated mothers scored more or less the same throughout the whole period.

Changes in reading literacy performance were more consistent than in other PISA domains. A sustainable growth, noncontingent on cultural capital, was observed after 2005. However, in 2012–2015 improvements were more conspicuous in those groups of students with non-college-educated mothers.

As we can see, the two groups identified based on social characteristics show different dynamics of PISA performance in mathematics and science. This may reveal something either about educational interventions targeted at one category of students or about different effects of the same educational interventions on students from different social groups.

Figure 2. **The dynamics of TIMSS scores depending on mother's education**

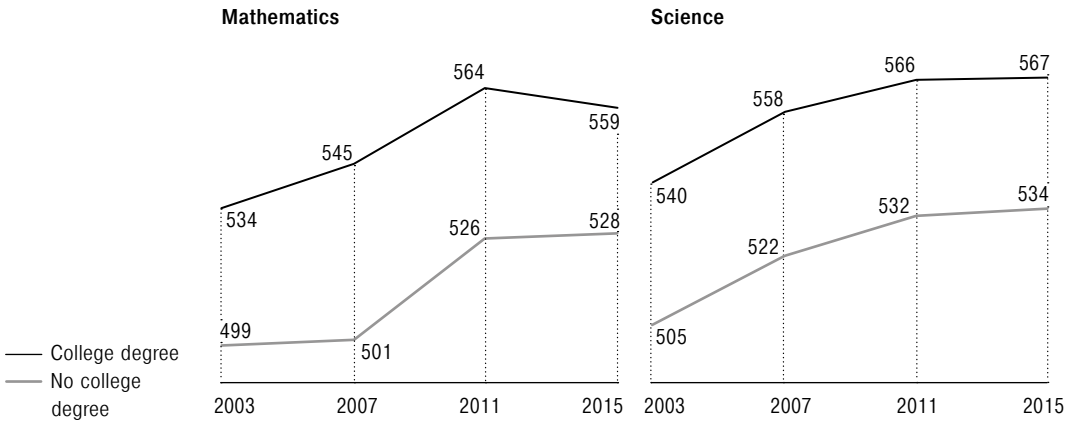
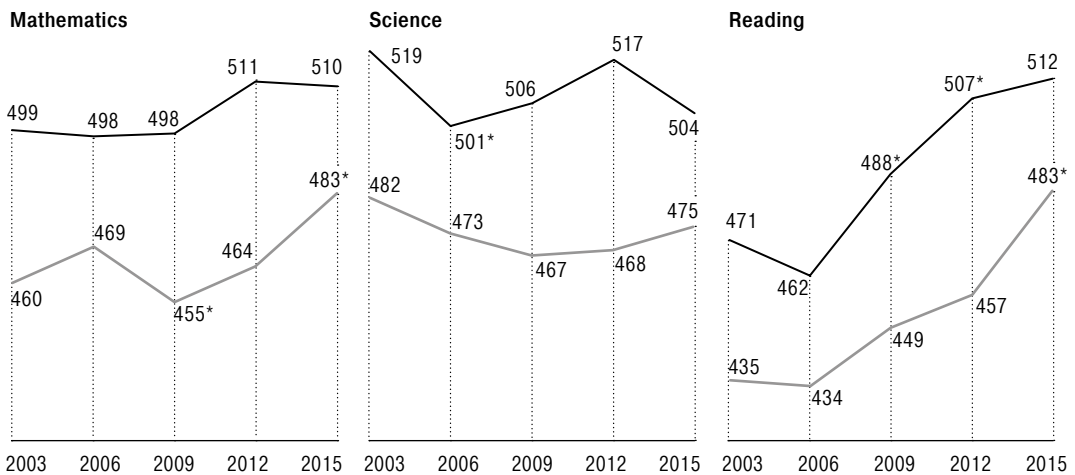
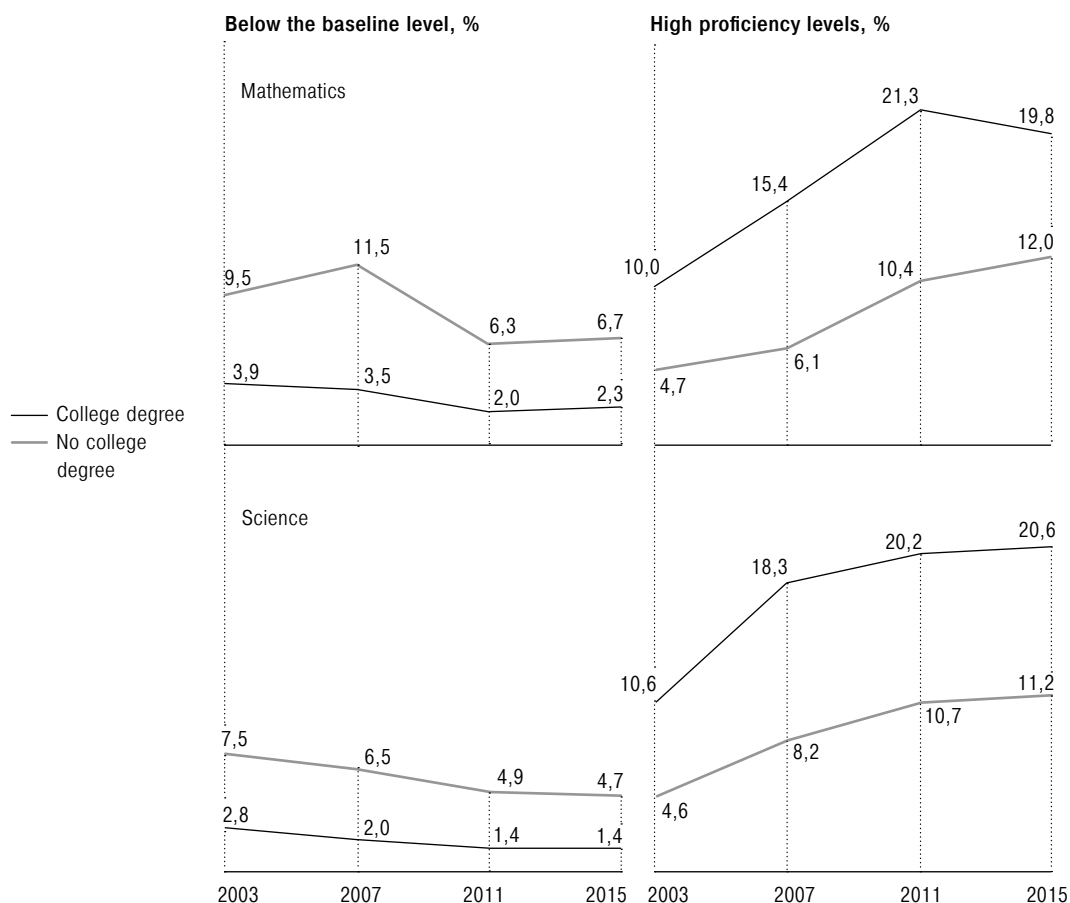


Figure 3. **The dynamics of PISA scores depending on mother's education**



Let us now look at Russian students' performance in terms of whether or not they achieve specific proficiency levels. TIMSS scores are pretty high throughout the period; in particular, students who have achieved high levels are more numerous than those who have not made it to Level 2 in both science and mathematics (Fig. 4). The proportion of students below the baseline level is reducing in contrast to that of students with high proficiency levels in both domains. Students from families with low cultural capital constituted the majority of those who scored below Level 2 throughout the whole period. The growth in the population of high-performing students was provided for by children from families with high cultural capital. Consequently, the lack

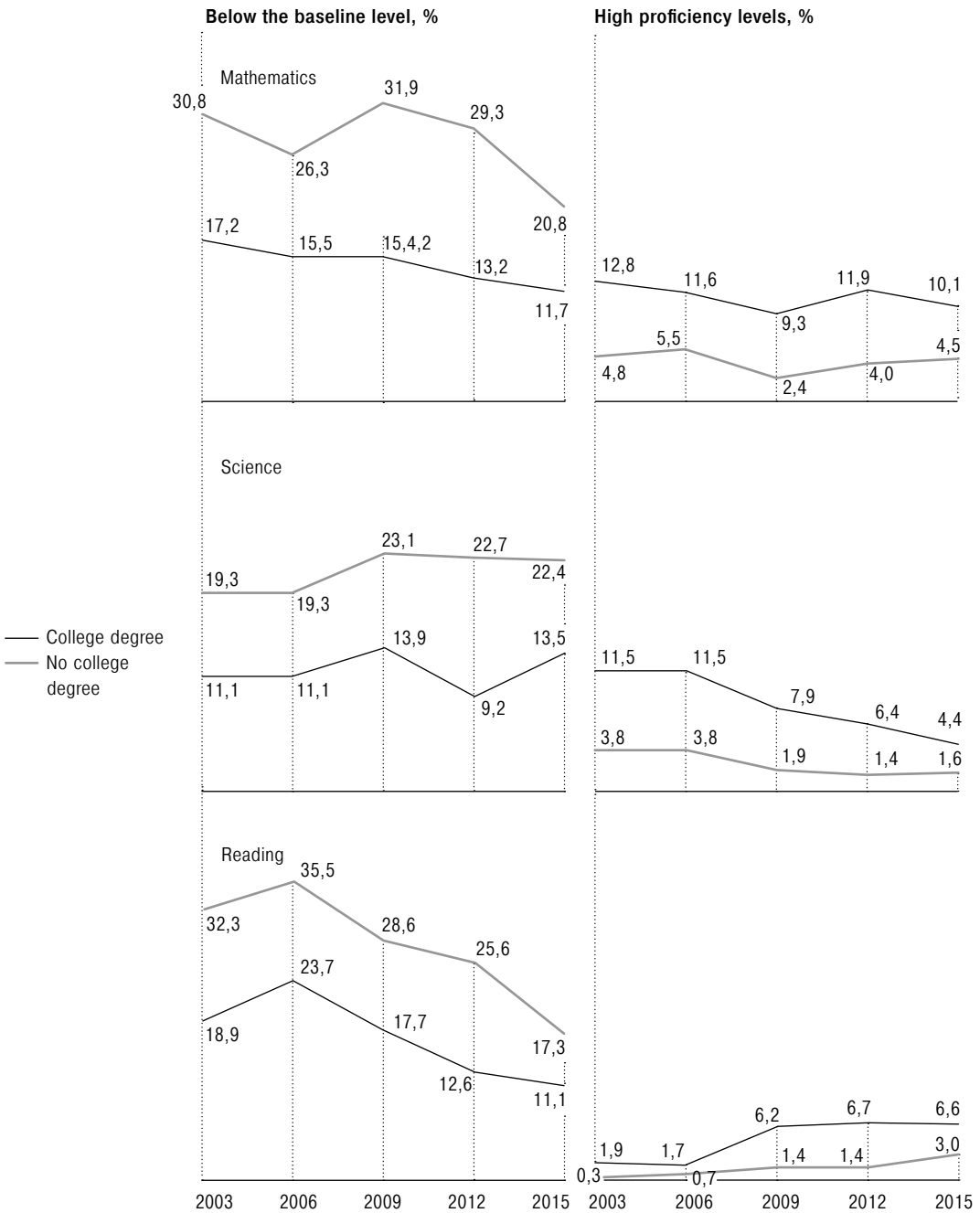
Figure 4. **TIMSS 2003–2015: Russian students' performance in terms of achieving specific proficiency levels**



of basic skills in mathematics and science is more typical of students with non-college-educated mothers.

By contrast, the percentage of students below the baseline level in the PISA is higher in all domains than the proportion of high performers (Fig. 5). Unlike in the TIMSS, the dynamics of the percentage composition of students with different proficiency levels in the PISA varies from domain to domain. About one fourth of students with low cultural capital never made it to Level 2, and high levels were only achieved by less than 5%. The percentage of students with high proficiency levels in science had even dropped by 2015 against the background of the stagnant proportion of those below the baseline level. As a result, the percentage of high performers became almost the same in groups with different cultural capital. As for reading, about one fourth of students with high cultural capital and over one third of

Figure 5. **PISA 2003–2015: Russian students' performance in terms of achieving specific proficiency levels**



those with non-college-educated mothers did not achieve the baseline proficiency level. However, the proportions reduced sharply after 2009. At the same time, high levels were only achieved by a small portion of school students, their percentage being more or less the same in both social categories.

Just as in the TIMSS, the proportion of students below the baseline proficiency level was lower among children with high cultural capital in all domains. However, the percentage of high performers with college-educated mothers did not exceed the percentage of successful students with lower cultural capital in all domains as dramatically in the PISA as it did in the TIMSS.

3. Regional inequality in education

Russian students' scores in international assessments vary widely in all domains depending on the size of populated locality. The dynamics of indicators is positive here too, with inequalities between students from different social backgrounds reducing. Yet, each of the two studies has its subtleties.

Regional inequalities mostly decreased in the TIMSS (Fig. 6). Populated localities were divided into two groups, so there were disparities in test scores between students in large cities and those in small settlements throughout the whole period of observation. However, the gaps in mathematics and science reduced, largely due to a more dynamic improvement in the performance of students from rural localities.

The dynamics of PISA performance also showed some reduction in regional inequalities (Fig. 7). As in the TIMSS, a more intensive growth was demonstrated by students from small localities, while the scores of students in the major population centers did not change significantly in mathematics and dropped in science in 2012–2015. This resulted in a disparity in PISA performance between the two groups of populated localities in 2015 (the inequality had been less different in 2003).

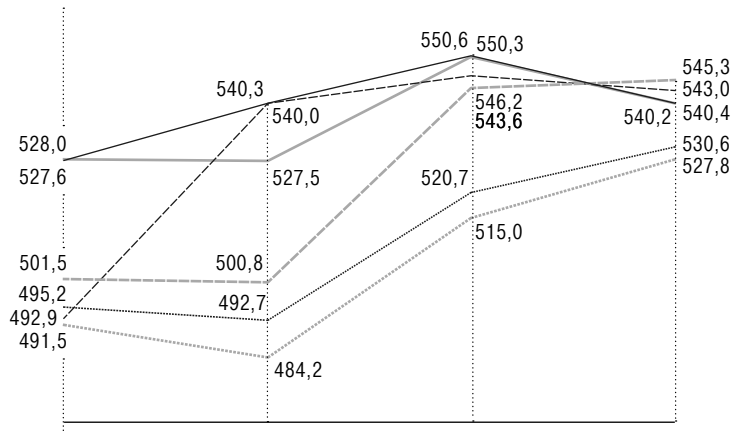
PISA reading performance was improving consistently in settlements of all types (with the exception of large cities in 2012–2015). Therefore, regional inequalities in reading literacy changed less than in other domains. Meanwhile, the groups of localities are less identifiable in this test.

In order to analyze the changes in student distribution among proficiency levels, the two extreme groups were compared: students from rural settlements of less than 3,000 and those from large cities (over 500,000 in the TIMSS and over 1 mln in the PISA).

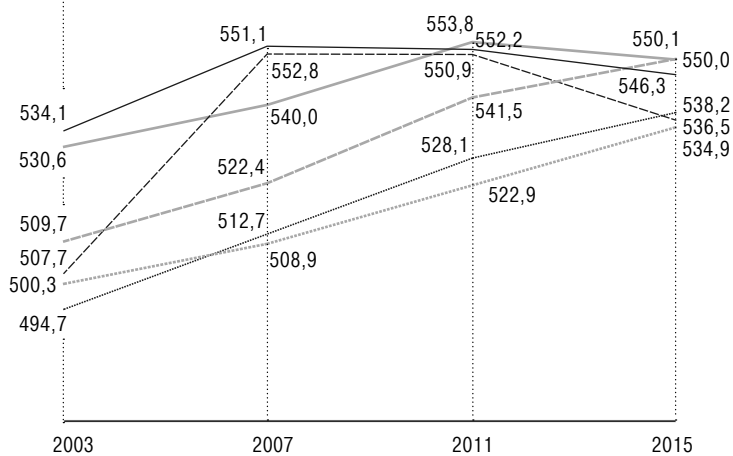
Students from large cities achieved high levels more often than they scored below the baseline level in the TIMSS, in contrast to their rural peers (Fig. 8). The percentage of students below Level 2 was decreasing in both mathematics and science throughout the whole period (starting from 2007 in mathematics), yet faster in small localities.

Figure 6. **The dynamics of TIMSS performance depending on population**

Mathematics



Science

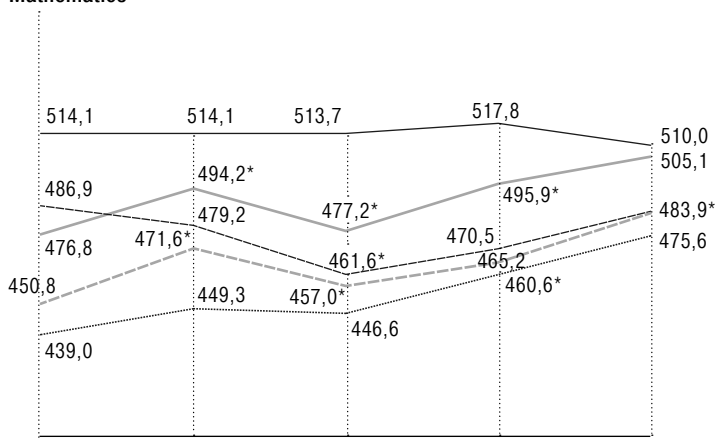


As a result, regional disparities in the proportion of children with no basic skills in these domains had reduced somewhat by 2015. The percentage of students with high proficiency levels, on the contrary, was growing in 2003–2011 in settlements of both types. It continued doing so in rural schools up until 2015, while plummeting in large cities. This way, the proportions of students with high proficiency levels in rural settlements and large cities became equal in both domains in 2015.

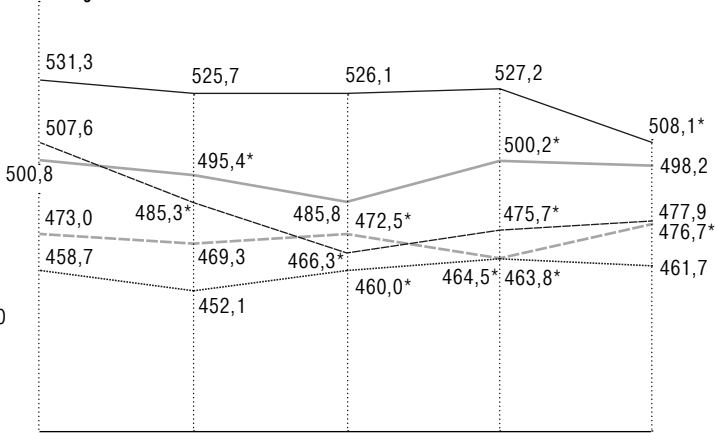
Proportions of students below the baseline level and those above the high level in the PISA were almost the same (Fig. 9) in all domains (starting from 2009 in reading) in large cities and changed little over time, especially in mathematics. There were a lot of students who did not make it to Level 2 and very few with high proficiency levels in rural

Figure 7. **The dynamics of PISA performance depending on population**

Mathematics



Science§



— > 1,000,000
 — 100,000–1,000,000
 - - - 15,000–100,000
 - - - 3,000–15,000
 < 3,000

Reading

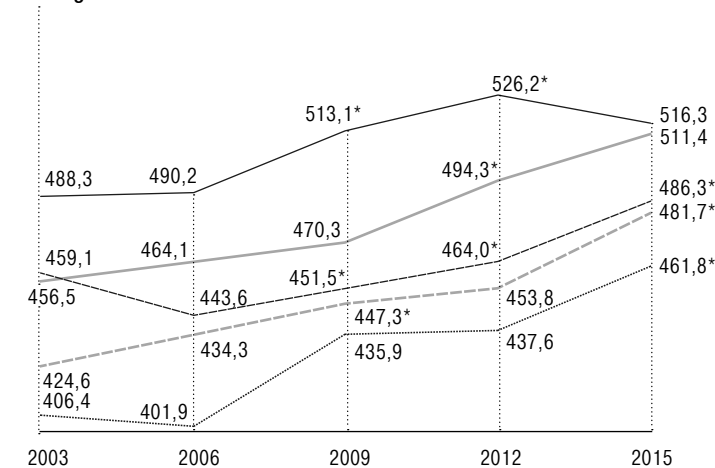
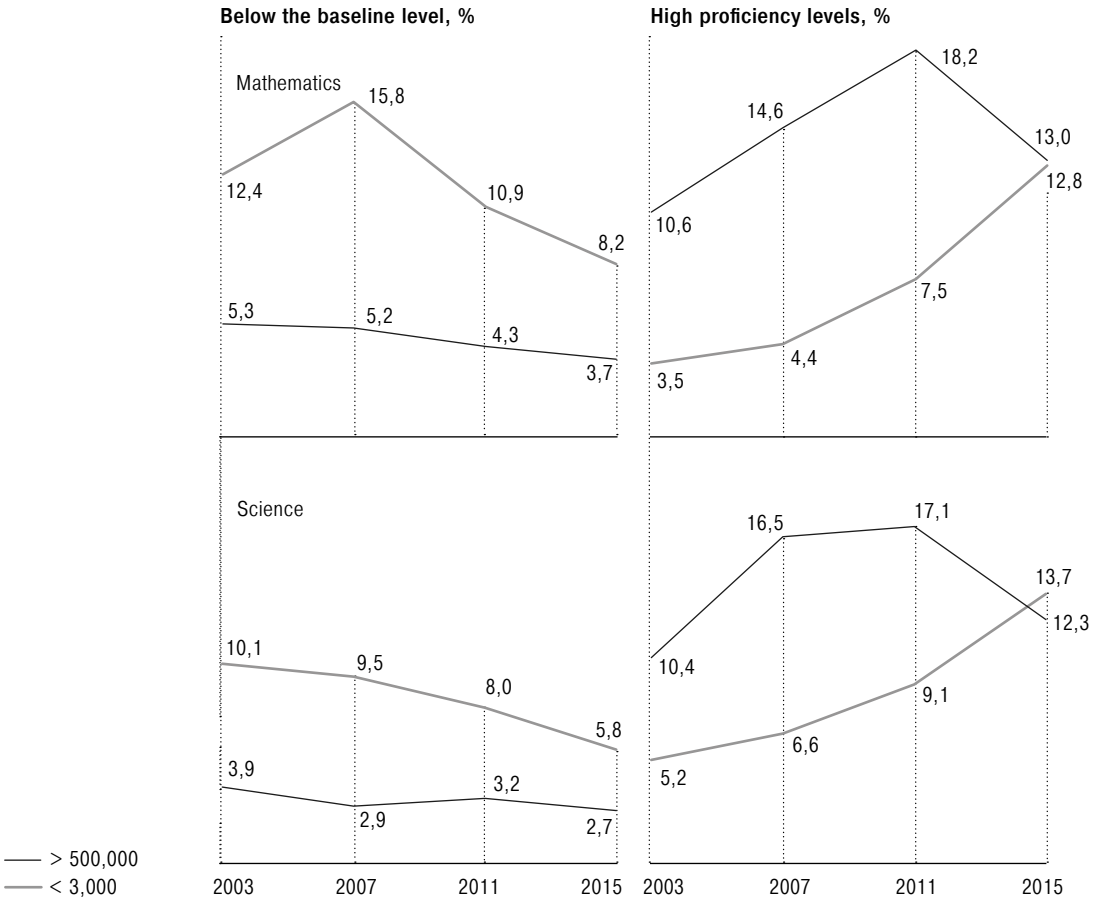


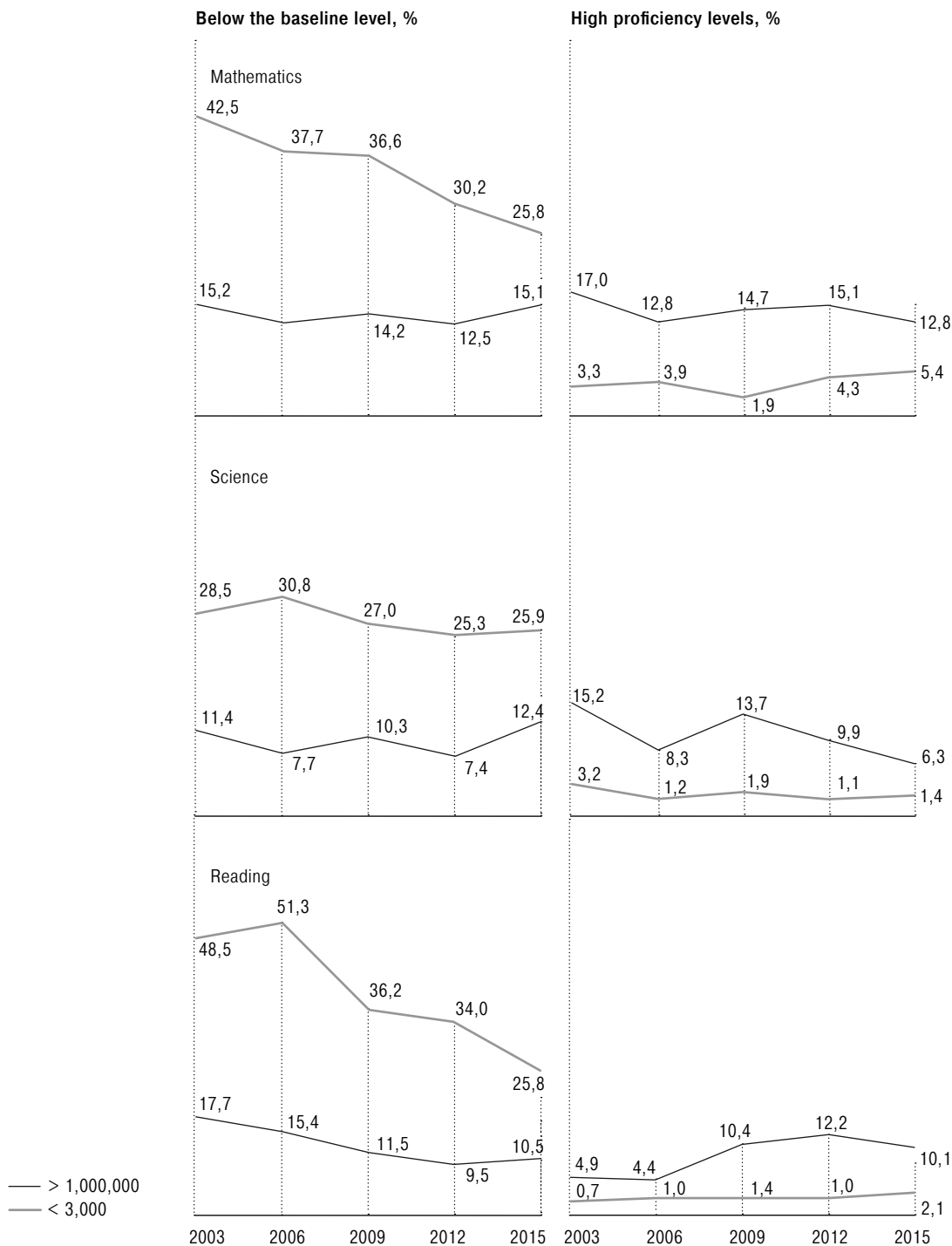
Figure 8. **TIMSS2003–2015: Proficiency levels among students in rural settlements and large cities**



schools. However, rural students showed more perceptible positive dynamics: the percentage of functionally illiterate school children was falling throughout the whole period in mathematics and starting from 2006 in reading (the changes in science were insignificant, in 2009–2015 particularly). The proportion of top scorers in rural areas did not change much in any of the domains.

In general, a few important patterns can be identified when analyzing the dynamics of Russian students’ TIMSS and PISA performance. First of all, science performance stagnated in both tests. Next, there was no improvement in PISA scores among students from families with high cultural capital and those in large cities, i. e. students from more advantaged socioeconomic backgrounds. This marks a certain ceiling in the education system. At the same time, the performance of students with low cultural capital and those from rural areas improved, reducing the overall educational inequality. Possible causes of the ob-

Figure 9. **PISA 2003–2015: Proficiency levels of literacy among students in rural settlements and large cities**



served dynamics in Russian students' TIMSS and PISA scores as well as the meaning of the tendencies revealed were discussed in interviews with the experts mentioned above.

4. Possible reasons for changes in TIMSS and PISA performance

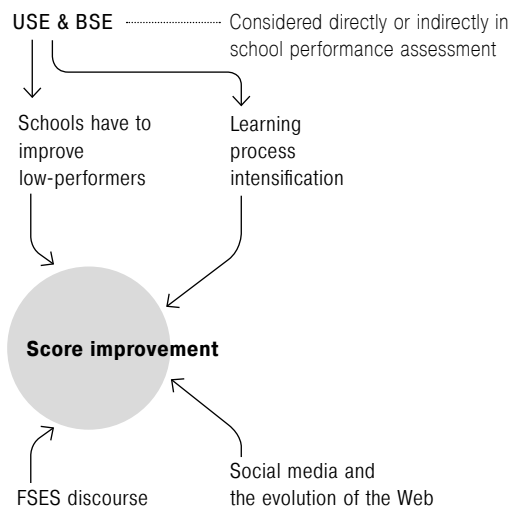
4.1. Improvement in mathematical and reading literacy among students with low cultural capital and rural students

The experts consider the development and intensification of external control policies as well as the introduction of the USE (Unified State Exam) and the BSE (Basic State Exam) as the fundamental assessment criteria to be among the most critical reasons for literacy improvements among students who had traditionally been low performers (Fig. 10). As they point out, there used to be a group of schools and students that literally slipped out of the education authorities' control. However, as soon as high-standard examinations were introduced and came to be used as a school assessment tool, and at the same time the number of diagnostic tests increased, educational institutions had to ensure at least some minimum improvements. School teachers and administrators faced the need to reduce the number of low performers and underperformers, which entailed an increase in scores achieved by Russian students in international assessments. As the experts note, the effects of introducing the BSE, for example, extend not only to ninth-graders but also to earlier stages of school education: "...They don't start from Grade 9 but earlier—from Grade 6, 7 or 8"; "The requirement to improve exam performance allowed schools to intensify the learning process, which could contribute to the increase in PISA scores."

Naturally, "The USE and BSE are largely based on obsolete knowledge standards and hardly assess how knowledge is applied in real-life situations", the experts admit. Nevertheless, they believe that the introduction of these assessment tools could help increase the overall level of literacy. In addition, the BSE has used reading and experiment-based tasks over recent years, so PISA performance can be expected to improve in the years to come.

The experts also point out that attempts have been made, albeit to an insufficient extent, to stimulate the improvement of teacher quality or at least reorient teachers toward more advanced methodologies. These changes are potentially more significant for students from disadvantaged social groups, whose learning is more contingent on teachers and school. The teacher pay reform attracted some young teachers and subject-specific professionals with no teaching degrees to schools. Such specialists normally have a broader professional outlook, find themselves more open to experimenting, and bring in innovative ideas. The split of salary structure into base wage and incentives prompted teachers, one way or another, to upgrade their teaching practices: "Say, participation in Olympiads. When salaries depend on children's participation in Olympiads, teachers have to engage and prepare their students—and standard textbooks are not enough here. Although it may be not too efficient, it's still better than nothing."

Figure 10. **Factors of improvement in mathematical and reading literacy among students with low levels of cultural capital and rural students**



Beyond that, professional online communities and distance advanced training courses have been emerging actively over the last decade. Such communities have become an effective resource for rural teachers, allowing them to obtain professional assistance from leading Russian experts. Similar results have been achieved by the Estonian teacher education reform [Khavenson, Carnoy 2016].

The introduction of the second-generation Federal State Education Standard (FSES) is considered by the experts to be another factor of performance improvement among students with traditionally low scores. The new standard centered more on the skills measured by the PISA. Meanwhile, its influence was not direct: even in the academic year 2016/17, upgraded curricula were only applied to sixth- and seventh-graders. Besides, a number of experts point out that the sign of compliance to the new standard does not always mean that the textbook's content has changed: "As a result, 'knowledge-based' textbooks have been brought into mass use." However, the educational discourse has changed: "It is not what we communicate to students in the classroom, not the range of topics we should cover, but what we should teach them that matters." The what-to-cover attitude has been forced out by the orientation towards what knowledge and competencies students should come out with. The most proactive teachers have started looking for new ways of teaching.

The introduction of the new standard involved funding for advanced teacher training courses, procurement of new equipment, textbooks, and other study materials: "For example, computers were

purchased for primary school to meet the standard in 2012, but they have been used by everyone, not only elementary students.” “Higher-end” schools tend to benefit the most from the allocation of funds, the experts observe. Nevertheless, rural schools and schools in challenging social contexts have been provided the opportunity to improve their resource base too.

Finally, the experts often mentioned a non-school factor of performance improvements in assessments such as the PISA. Living in today’s world implies that tons of diverse information on the Web are consumed and analyzed and children engage in ongoing communication in social media. Such activities promote the development of reading literacy, as measured by the PISA. As the digital world and the Internet are becoming ubiquitous, web interactions are starting to involve children from families with different cultural capital as well as from settlements of different population sizes. Often, this communication is of high quality, e. g. interest groups, educational channels, etc.

4.2. No performance improvement among students from large cities and families with high cultural capital

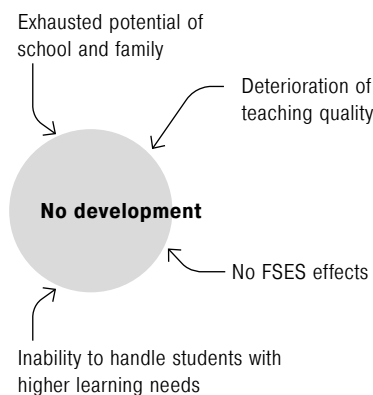
The experts believe that students with traditionally high TIMSS and PISA scores have reached their ceiling in the existing educational context. Stagnant results in both tests, the PISA particularly, indicate that the existing system has no potential for further growth and the necessary conditions develop too slowly. The major reasons for this include the overall deterioration of teaching quality, teachers’ predominant focus on weak learners, and, most importantly, purely formal implementation of the FSES into teaching practices, the experts hold (Fig. 11).

The decrease in teaching quality is especially conspicuous in lycées and gymnasiums, which are often attended by children with high cultural capital, the experts find: “The Social Navigator project reveals that specialized schools perform worse than they used to.” The situation is almost impossible to improve with the existing education program, since “If we stick to it [the already complicated program] and add PISA-measured requirements, we’ll just need more [working] hours. Intensification is unable to solve the problem.”

The established education system suggests that teachers focus on low performers. Institutional signals imply that “punishment” for low BSE and USE scores outweighs incentives for good scores or Olympiad prize winners: “A regular teacher doesn’t focus on top-performers, but instead, on areas where they can get penalized—most often, late or missed assignments.” In addition, teachers are overloaded and have no time for high-performing students who express higher learning needs. It is tacitly assumed that such students can cope on their own and teachers should “tinker with weak learners and boost up their performance to avoid unsatisfactory outcomes.”

Deterioration of teaching quality is also captured in teachers’ inability to work beyond the standard education program. In order to prepare students for Olympiads and challenging USE tasks, they need to embrace additional new knowledge which is rarely offered in advanced

Figure 11. **Reasons for stagnant TIMSS and PISA performance among students from large cities and families with high cultural capital**



training courses. For this reason, most teachers find themselves unable to handle students with higher learning needs.

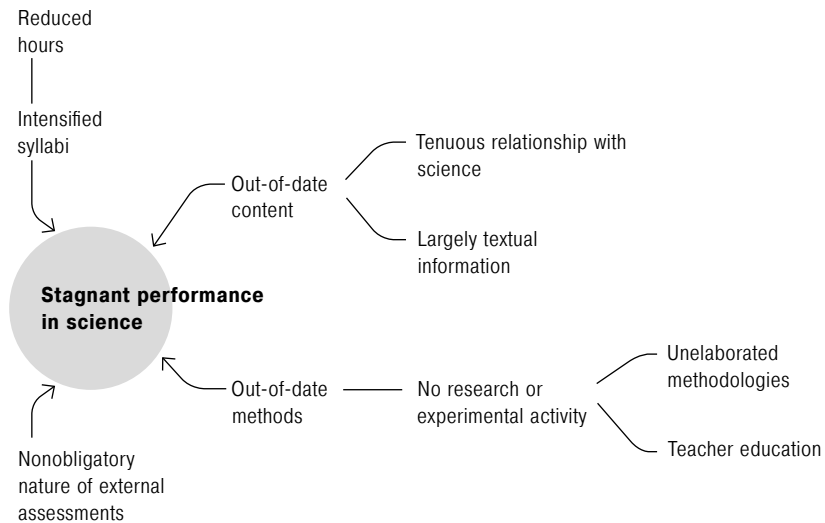
It is too early to expect any significant effects on international rankings from the new standards, especially in terms of high-potential students. It is schools with traditionally good performance in the knowledge-oriented education program that the FSES has permeated the least. Such schools have got into the habit of considering their teaching practices successful and leading to desired outcomes. In addition, the existing system of advanced teacher education has also failed to prove effective in convincing teachers that using the new standards is helpful and relevant: “No one talks to teachers in their language. FSES standards are just imposed with no explication given.”

Finally, a number of general economic factors had an impact on the dynamics of educational outcomes. It was urban population and families with high cultural and economic capital that were the first to be affected adversely by the financial and economic crises of 2008 and 2012. Families of these types had always invested as heavily as they could in their children’s education, and the crises ripped them of the possibility to increase their investments. “Educational outcomes in these groups are determined by two factors: family and school. While families keep doing their part, nothing has changed in schools. As a result, children did their best right from the beginning and had no potential for further development because nothing changed.”

4.3. No score improvement in science

The causes of stagnant science performance identified by the experts can be divided into three categories: related to the content of education, to the teaching methods, and to the external assessment system (Fig. 12).

Figure 12. **Reasons for stagnant performance in science**



The content of science education has essentially turned obsolete, the experts believe. Performance in the TIMSS and even more so in the PISA could be affected by an excessively theoretical teaching of natural sciences. The experts pin some of their hopes on the FSES, admitting, however, that the general syllabus guidelines for this domain are changing very slowly. As a result, syllabi and textbooks have little to no research or experimental components in them. “Teaching geography and biology does not involve any problem solving, being restricted to inculcating some catalogue-type knowledge; it also offers little application and no explanation at all.”

Russian students’ performance in international assessments could also be affected by the intensification of science education, meaning that hours allocated for these subjects reduced whereas no relevant change in syllabi or the teaching conception took place: “They are trying to cram the same material, cram being the key word, rather than teaching the scientific vision”; “In fact, we have [only] compressed the learning process, as no hours have ever been added and the syllabi haven’t changed much.” A situation where teaching is intensified while preserving the old content organization policies is unfavorable for score improvement, the experts are convinced.

The experts insist that there is a critical need to change the existing teaching practices. It is in science that advanced extracurricular teaching methods can find their broadest application, which they do not. Field trips and observations, excursions, and many other types of activities can be used in such subjects as biology or geography. Lots of museums and scientific institutions are willing to offer their training

modules for chemistry and physics classes. However, these opportunities have hardly been used.

Teachers are not prepared for teaching contemporary science. Meanwhile, relevant teaching qualifications and skills are indispensable in promoting students' experimental activity: "The 2017 All-Russia Tests on geography, physics, chemistry and biology involved reading, context problems, and experimental design—and teachers don't know how to deal with tasks like that." Teachers have "no habit of running experiments or observations." As a result, even when schools upgrade their lab equipment for experimenting, the efficiency of using it in the learning process is questionable: "It remains unclear how this equipment is used—there is no evidence of its relevance." It is not only school syllabi but also teacher education methods and textbooks, including those on the methodology of teaching, that have seen their day, the experts argue.

Finally, unlike mathematics, science could not be influenced strongly by the introduction of external assessment tools. Students who take the BSE and USE in natural sciences are not that numerous: "Children who are able to solve complex problems in our domain probably do well in the PISA too... Another question is... These are optional subjects: about ten percent choose chemistry and about twelve, biology." Otherwise speaking, few school students learn to solve high-complexity science problems.

5. Conclusion and discussion

According to international studies, disparities between TIMSS scores of Russian students with high and low cultural capital did not reduce in 2003–2015, i. e. the changes in performance in these groups were synchronous. In other words, factors associated with TIMSS performance affect both groups of school students equally.

In the PISA assessment, students with low cultural capital improved their scores. In contrast, the performance of students from families with high cultural capital showed no progress. As a result, the gap between PISA scores in these two groups reduced (with the exception of reading literacy).

As for regional inequalities in education, they gradually decreased in the TIMSS: the difference between students from large cities and their rural peers was extremely small. It can be suggested that the education program is implemented more or less in the same way, no matter where students live. Meanwhile, the PISA, which measures knowledge application skills, reveals a different dynamic: inequality in this test has definitively transformed into a significant difference between large cities and all other types of settlements.

The improvement of performance among students with low cultural capital and rural students as well as the related decrease in educational inequality can be regarded as a positive trend in Russia. However, stagnation and even a slight decline in the scores of students

from large cities and families with high cultural capital are a negative sign for the education system. Students in the latter group perform worse than their foreign peers [Carnoy, Khavenson, Ivanova 2015]. The dynamics observed indicates that school is unable to satisfy higher learning needs. If the existing trends persist, school will have no potential to achieve any truly outstanding educational outcomes.

Expert interviews reveal the most important educational initiatives in recent years which could influence directly or indirectly the dynamics of Russian school students' performance in comparative international assessments. The introduction and expansion of external assessment tools is considered by the experts to be a crucial and mostly positive factor. It has had a particularly significant impact on the performance of students from families with low cultural capital and those living in rural areas. Teachers' closed-mindedness and unwillingness to integrate new things appear to be a very common barrier on the way towards the modernization of education, the experts are convinced. In their opinion, the process of implementing the FSES and upgrading the content of education is extremely slow, fragmentary, and largely formal. As a consequence, innovations stall and only partly reach schools. It is important to consider that changes in policy do not affect practice right away due to the system inertness. Besides, changes in students' performance are not always related directly to education policies. For instance, the information environment is becoming heavily saturated as social media evolve and the Internet spreads around the globe, which is expected to develop information skills and improve literacy in students.

Russia is not a unique case in terms of measures undertaken to improve the quality of education in general and the performance in international studies in particular. The PISA assessment was launched in the early 2000s, making the best part of the participating countries face the need to reform their national education systems. The political approaches they opted for turned out to be similar in many ways: publication of PISA results drove the development and design of national assessment tools as well as the renewal of education standards in Germany, Denmark, Japan, Switzerland, Hungary, Norway, Luxembourg, and other countries [Breakspear 2012].

It is vital today that school, as a tool of mass education, changes its teaching practices. Modern economies want professionals who are not only conversant with theory but also able to apply their knowledge in diverse real-life contexts. The ability to analyze and interpret information and a high level of functional literacy are the best guarantee of the ability to solve problems in professional and social life, open-mindedness, and aptitude for learning.

References

- Amini C., Nivorozhkin E. (2015) The Urban–Rural Divide in Educational Outcomes: Evidence from Russia. *International Journal of Educational Development*, vol. 44, September, pp. 118–133.
- Bolotov V., Valdman I., Kovaleva G., Pinskaya M. (2013) *Rossiyskaya sistema otzenki kachestva obrazovaniya: glavnye uroki* [Russian Quality Assessment System in Education: Key Lessons]. *Kachestvo obrazovaniya v Evrazii*, no 1. Available at: <http://cyberleninka.ru/article/n/rossiyskaya-sistema-otsenki-kachestva-obrazovaniya-glavnye-uroki> (accessed 10 November 2017).
- Bourdieu P. (2011) The Forms of Capital. *Cultural Theory: An Anthology* (eds I. Szeman, T. Kaposy), Malden, MA: Wiley-Blackwell, vol. 1, pp. 81–93.
- Breakspear S. (2012) The Policy Impact of PISA: An Exploration of the Normative Effects of International Benchmarking in School System Performance. OECD Education Working Papers No 71.
- Carnoy M., Khavenson T., Ivanova A. (2015) Using TIMSS and PISA Results to Inform Educational Policy: A Study of Russia and Its Neighbours. *Compare: A Journal of Comparative and International Education*, vol. 45, no 2, pp. 248–271.
- Carnoy M. et al. (2016) Revisiting the Relationship Between International Assessment Outcomes and Educational Production: Evidence from a Longitudinal PISA-TIMSS Sample. *American Educational Research Journal*, vol. 53, no 4, pp. 1054–1085.
- Field S., Kuczera M., Pont B. (2007) No More Failures. Ten Steps to Equity in Education. Summary and Policy Recommendations. Paris: OECD.
- Kasprzhak A., Mitrofanov K., Polivanova K., Sokolova O., Tsukerman G. (2005) Pochemu nashi shkolniki provalili test PISA [Why Our School Students Failed the PISA Test]. *Direktor shkoly*, no 4, pp. 4–13.
- Khavenson T., Carnoy M. (2016) The Unintended and Intended Academic Consequences of Educational Reforms: The Cases of Post-Soviet Estonia, Latvia and Russia. *Oxford Review of Education*, vol. 42, no 2, pp. 178–199.
- Kovaleva G., Krasnovskiy E., Krasnokutskaya L., Krasnyanskaya K. (2004) Rezultaty mezhdunarodnogo sravnitel'nogo issledovaniya PISA v Rossii [The Results of the International Comparative Study PISA in Russia]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 1, pp. 138–180.
- Konstantinovskiy D. (2008) Neravenstvo i obrazovanie. Opyt sotsiologicheskikh issledovaniy zhiznennogo starta rossiyskoy molodezhi (1960-e gody—nachalo 2000-kh) [Inequality and Education. Experience of Sociological Research on Youth Starting Out in Life (From the 1960s through the Early 2000s)], Moscow: Center for Social Forecasting and Marketing.
- Konstantinovskiy D. (2010) Neravenstvo v sfere obrazovaniya: rossiyskaya situatsiya [Inequality in Education: The Russian Case]. *Monitoring obshchestvennogo mneniya: ekonomicheskie i sotsialnye peremeny*, no 5 (99), pp. 40–65.
- Konstantinovskiy D., Kurakin D., Roshchina Y., Vahshtajn V. (2006) Dostupnost kachestvennogo obshchego obrazovaniya v Rossii: vozmozhnosti i ogranicheniya [The Accessibility of Quality Education in Russia: Opportunities and Restrictions]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 2, pp. 186–202.
- Kosaretsky S., Grunicheva I., Goshin M. (2016) Obrazovatel'naya politika Rossii kontsa 1980-kh—nachala 2000-kh: deklaratsii i prakticheskoe vliyanie na neravenstvo v obshchem obrazovanii [Russian Educational Policy of the Late 1980s—Early 2000s: Declarations and the Actual Impact on Inequality in General Education]. *Universe of Russia*, vol. 25, no 4, pp. 115–135.

Lifelong Learning in the Context of Economic Development and Government Effectiveness

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Abstract. Statistical data is used to analyze formal and supplementary adult education attainment rates in the European Union, OECD countries and Russia depending on the basic economic development characteristics and the government effectiveness index that the World Bank has used to assess the quality of governance for the last two decades. In countries with low GDP, formal and supplementary adult education attainment rates are linearly dependent on the size of investment in fixed capital and show weak correlation with the index of government effectiveness. In countries with

high levels of GDP and active investment processes, the key role in the growth of formal and supplementary education attainment rates is played by governmental actions that prompt the population and employers to engage in learning and supplementary education programs. Russian Federal State Statistics Service (Rosstat) data shows similar correlations between engagement of the employed population in lifelong learning and economic development indicators. The study includes analysis of official development strategies and the existing lifelong learning policies pursued by the countries as well as national cases that include the content of education programs, target groups and measures to maintain the adult population's access to lifelong learning. Incentives to increase formal and supplementary adult education attainment rates are identified, and the relationship between their implementation and economic development of countries is determined.

Keywords: lifelong learning, adult education, formal education attainment rate, supplementary education attainment rate, economic development indicators, government effectiveness.

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I. Zhuchkova.

The concept of lifelong learning was born in the mid-1960s as a response to the need for continuing education prompted by the boom in technology [Faure 1972]. Personnel competencies required regular

adjustments to technology upgrades and emerging industries. Employees who learned to use new equipment and technologies were expected to show better labor productivity and thus increase the GDP per capita. However, it was not until the early 1990s that the need to integrate various programs into lifelong learning as a single conception of permanent adult education was recognized [Pepin 2007:121–132].

Statistics show that participation rates in lifelong learning differ dramatically across countries. For example, 51% of the population aged 25–64 are engaged in some kind of formal or supplementary education in the OECD countries, while the EU rate of 40.3% is dragged down by the most recent member states: Bulgaria (26.0%), Poland (24.2%) and Romania (8%) as well as Greece (11.7%) [Desjardins 2015]¹. The rates are even lower in Southeastern Asia, e. g. under 5% in Vietnam. As for Russia, 17% of adult population were engaged in education and training in 2016 [NRU HSE 2016].

It was in 2009 that researchers first noticed the relationship between per capita GDP and participation of the labor force in education and training in the OECD countries [UNESCO Institute for Lifelong Learning 2009:64].

Indeed, employee training increases the quality of human capital (the level of its labor potential, the cumulative body of knowledge, and mobility), which translates into better labor productivity. As high-performance technologies are becoming ever more accessible and can be obtained today without any serious restrictions, human capital is probably the only resource that can ensure economic growth. Businesses that own quality human capital and have an opportunity to use it efficiently become essentially more successful in terms of both technology and revenues. Large-cap companies like Google or Intel are worth more than conventional producers of goods, including the giant corporations involved in high-tech extraction of raw materials.

Professional on-the-job training and retraining, either on- or off-site, are an important source of human capital development and reproduction [Gimpelson, Kapelyushnikova, Roshchin 2017:120]. They shape the supply of professional skills and serve as a direct factor of labor productivity growth [Bassanini et al. 2007]. In addition, recent studies in the Russian labor market show that employees who have obtained advanced training have their salaries increased by around 8% [Travkin, Sharunina 2016].

The human capital theory suggests that education is not an end-use product but a means of further added value production and thus an important factor in national and global macroeconomic growth as well as in income growth for individuals and businesses. The cost of education is regarded as a function of future income growth ensured

¹ [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Participation_rate_in_education_and_training,_2011_\(%C2%B9\)_\(%25\)_YB16.png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Participation_rate_in_education_and_training,_2011_(%C2%B9)_(%25)_YB16.png)

by previously incurred expenses on relevant educational services [Klyucharev et al. 2014].

Eric A. Hanushek and Ludger Woessmann identify at least three mechanisms through which education can influence economic growth. First, education increases the cumulative human capital of labor force, which results in better labor productivity and transition to a higher equilibrium level of output. Second, education may improve the innovative potential of the economy. Third, it can facilitate the spread and transfer of knowledge required to understand and process new information as well as to successfully implement new technology developed by others, which, again, promotes economic growth [Hanushek, Woessmann 2007:115–185].

**Correlations
between participa-
tion in lifelong
learning and
economic develop-
ment**

The relationship between the participation of citizens aged 25–64 in education and training and the GDP per capita was analyzed using Eurostat², PIAAC [Desjardins 2015] and Rosstat³ statistics. The correlation was found to be linear and quite stable for the OECD countries (Fig. 1) as well as for the EU member states (Fig. 2), the correlation coefficients being 0.7 and 0.8, respectively. Studies conducted by EU researchers prove that the correlation properties are not contingent on the methods applied: the correlation is maintained at the level of 0.7 regardless of whether respondents acknowledged engaging in lifelong learning programs over the last 12 months (Fig. 2) or only 4 weeks (Fig. 3). Russia's correlation coefficient is very much in line with this tendency (Fig. 1 and 2).

Russia's educated population works better and achieves better economic outcomes: the correlation between economic growth indicators and participation in lifelong learning is almost the same as in other countries (Fig. 4). Individual variations can be explained by a greater federal role in adult education, on the one part, and by active attraction of workers who obtain education in other regions and participate in industrial processes in rotating schedules, on the other hand.

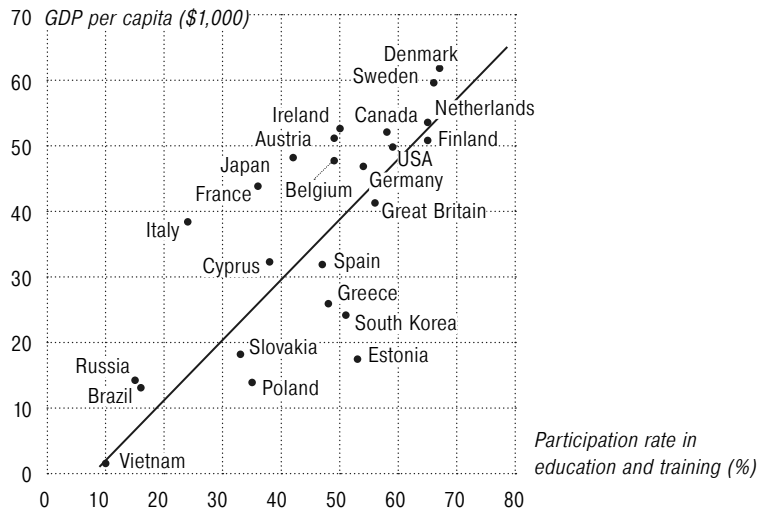
Employers' education assistance policies depend on economic and political factors, including cost-benefit ratio, national perceptions of education and training, and market-specific aspects of interaction among the major players [Pilz 2009:57–74].

In order to identify the economic factors that promote education assistance, interaction of the major stakeholders in the labor market will be analyzed in the context of their need to embrace lifelong

² Eurostat Statistics Explained. Education and training: [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Participation_rate_in_education_and_training_2011_\(%C2%B9\)_\(%25\)_YB16.png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Participation_rate_in_education_and_training_2011_(%C2%B9)_(%25)_YB16.png)

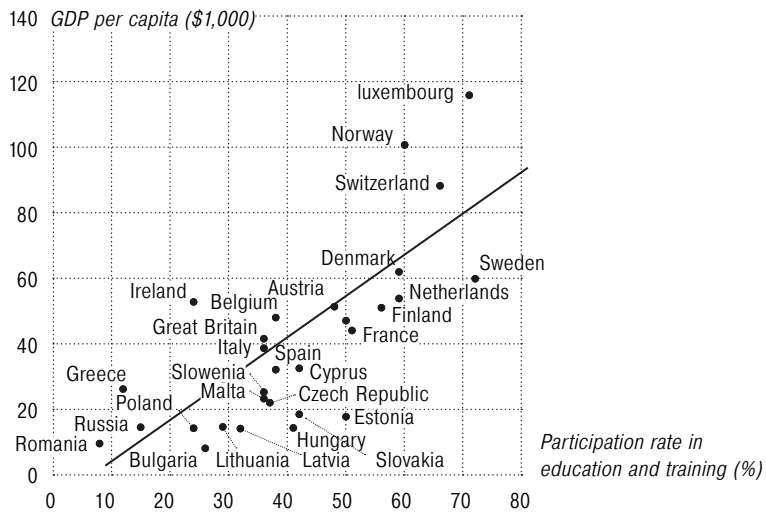
³ Russian Federal State Statistics Service (Rosstat). Bulletin "Continuing Education and Professional Training of Employees in 2016" (posted on 04/27/2017): http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/bbd2da8043f81ba38a78cbd9211eac8

Figure 1. The relationship between the 2011 GDP per capita and the participation rate in education and training in Russia and the OECD countries [Desjardins, 2015]



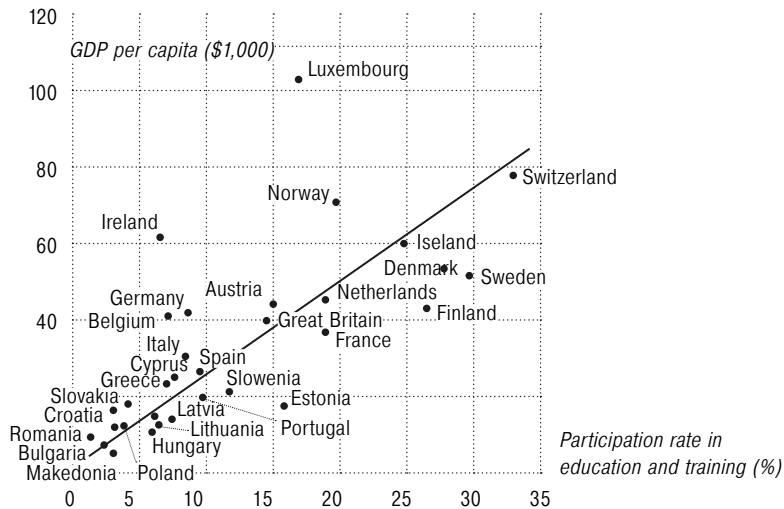
Source: GDP per capita (current US\$). <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

Figure 2. The relationship between the 2011 GDP per capita and the participation rate in education and training over the last 12 months in Russia and the OECD countries



Source: GDP per capita (current US\$). <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>; Eurostat Statistics Explained. Education and Training: [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Participation_rate_in_education_and_training_2011_\(%C2%B9\)_\(%25\)_YB16.png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Participation_rate_in_education_and_training_2011_(%C2%B9)_(%25)_YB16.png)

Figure 3. **The relationship between the 2016 GDP per capita and the participation rate in education and training over the last 4 weeks in the OECD countries**



Sources: GDP per capita (current US\$): <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>; Eurostat. Participation rate in education and training (last 4 weeks) by sex and age http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=trng_lfs_01&lang=en

Sources: Federal State Statistics Service (Rosstat). Performance Assessment and Monitoring Criteria for the Subjects of the Russian Federation: http://www.gks.ru/free_doc/new_site/rosstat/pok-monitor/pok-monitor.html; Federal State Statistics Service (Rosstat). Bulletin "Continuing Education and Professional Training of Employees in 2016" (posted on 04/27/2017): http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/bbd2da8043f81ba38a78cbd92111eac8

Figure 4. **The relationship between the GRP and the participation rate in education and training over the last 12 months in regions of the Russian Federation in 2016**

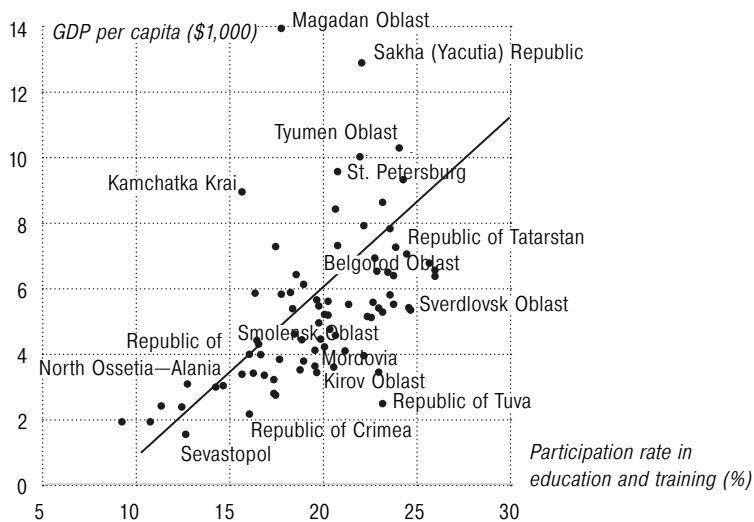
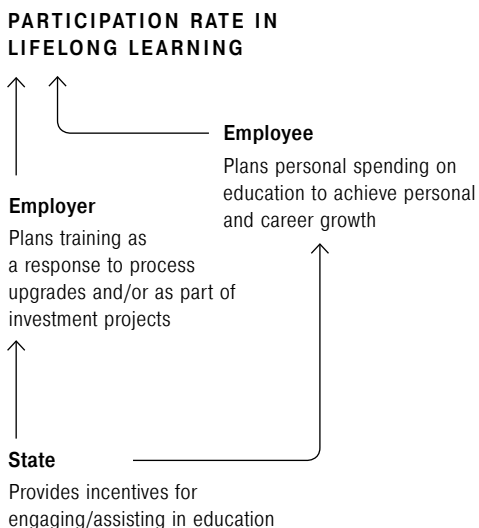


Figure 5. **Interaction among the major stakeholders in the labor market as a foundation of lifelong learning systems**



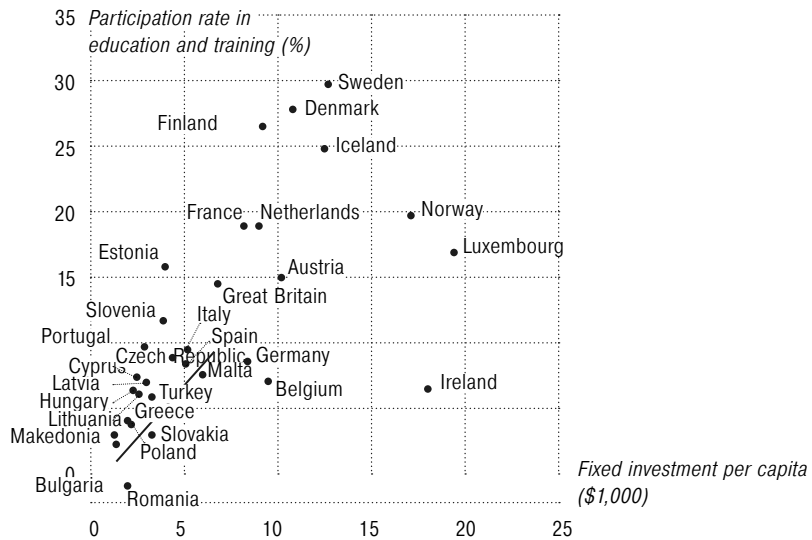
learning. Either the employer or the employee may decide that the latter needs some tuition (Fig. 5). Meanwhile, government agencies can motivate both parties to engage in training programs using certain incentives.

Companies may decide to organize training for their employees once they introduce new technology or equipment [Roshchin, Travkin 2015: 150–171], as the requirements for knowledge and skills are thus increased. Demand for highly qualified human resources can be difficult to satisfy in the external labor market, which is also short of cutting-edge professionals or is offering them at an excessive cost, so training and development of the existing staff becomes the most profitable strategy.

Investment processes also involve extensive staff training, especially when new plants of large Russian and foreign transnational corporations are opened [Gaponova, Korshunov 2017:208–226]. Business expenditure on investment in fixed capital, including innovative equipment, normally exceeds expenses on technology innovations substantially. According to Rosstat, Russian businesses spent \$20 bln on innovative technology and \$290 bln on investment in property, plant and equipment in 2015.

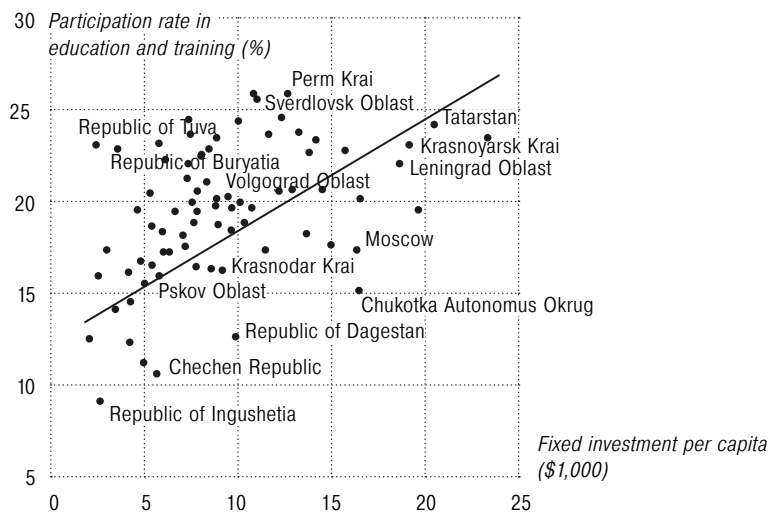
When a new plant is opened, new employees are hired. Investment budgets involve, aside from spending on fixed capital, proportional costs of teaching new skills to the staff. The more equipment and other fixed assets that have been purchased, the higher the expected employee participation rate in advanced training.

Figure 6. **The relationship between the participation rate in education and training and per capita fixed investment in EU countries in 2016**



Sources: Gross fixed capital formation (current US\$): <http://data.worldbank.org/indicator/NE.GDI.FTOT.CD>; Eurostat. Participation rate in education and training (last 4 weeks) by sex and age: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=trng_ifs_01&lang=en

Figure 7. **The relationship between the participation rate in education and training and per capita fixed investment in regions of the Russian Federation in 2016**



Sources: Federal State Statistics Service (Rosstat). Bulletin "Continuing Education and Professional Training of Employees in 2016" (posted on 04/27/2017): <http://www.gks.ru/wps/wcm/connect/rosstat/main/rosstat/ru/statistics/publications/catalog/bbd2da8043f81ba38a78cbd9211eac8>; Federal State Statistics Service (Rosstat). Performance Assessment and Monitoring Criteria for the Subjects of the Russian Federation: http://www.gks.ru/free_doc/new_site/rosstat/pok-monitor/pok-monitor.html

Comparison of data obtained from European statistical agencies reveals a correlation between the participation rate in education and training and per capita investment in fixed assets in EU countries in 2016 (Fig. 6). In countries with low investment rates, participation in lifelong learning grows noticeably following an increase in investment. However, no such correlation is observed in countries with per capita investment rates of over \$8,000. This may be explained by additional factors that come into play—government measures affecting employers and employees' decisions.

Since per capita fixed investment is low in Russia (\$1,400 in 2016), it can be suggested that the government has been very passive about employee retraining. Investors opening new plants is the main factor affecting the participation rate in education and training, so the correlation between participation in lifelong learning and the size of investment in fixed assets must grow consistently in every region of Russia. This suggestion is confirmed by the 2016 Rosstat data presented in Fig. 7.

The Government as a stakeholder in lifelong learning

Models determining how the key players interact in the labor market and how skills are built are not static: they mutate and evolve depending on the point in history, economic crises and shocks as well as political contexts [Busemeyer, Trampusch 2005:95–114; Thelen 2004]. Political leverage is what makes the government an influential stakeholder in the market of adult education. Its governance activities, including those concerning labor resources and the quality of human capital development, have a meaningful impact on the labor market. Being interested in social stability, the government uses lifelong learning purposefully to engage with the most active part of the population, providing conditions for professional and career growth through advanced training and acquisition of new skills. Besides, government participation in education removes the objective restriction on employee competency improvement, which is typical of employer-assisted education, where employers fear, not unreasonably, that better trained staff will find better jobs.

Government initiatives to motivate individual employees and the population as a whole to participate in advanced training influence the participation rate in lifelong learning, so many countries use them extremely actively:

- Most developed countries worked out and approved conceptions of lifelong learning in the early 2000s and have been updating and expanding their stipulated lists of government incentives ever since [UNESCO Institute for Lifelong Learning 2015].
- Measures that have been designed and actively applied include: a wide array of government support incentives for lifelong learn-

- ing; a liberal education system⁴; direct financing of employed population's skill improvement through certificates for learning and/or learning accounts; an elaborate system for assessment and recognition of qualifications, including informal ones; wide-scale courses on entrepreneurship and self-employment; various digital resources and skills navigators that help employees obtain professional competencies and choose efficient educational trajectories.
- The New Skills Agenda for Europe was adopted by the European Commission in June 2016⁵. It was designed to enhance the quality of skills and their role in the labor market.
 - Lifelong learning and adult education were named among the goals of UNESCO's Transforming our World: The 2030 Agenda for Sustainable Development⁶ in 2016.
 - The European Association for the Education of Adults declared 2017 the Year of Adult Education in Europe under the slogan "The Power and Joy of Learning"⁷.

Assistance to the population and employers in obtaining and organizing continuing professional education is becoming not only an economical but also a powerful political tool for ensuring the quality of governance and increasing public satisfaction with government performance.

The relationship between government effectiveness and participation in lifelong learning

A government effectiveness index, estimated using the World Bank's methodology since 1996⁸, is used in this study to explore the relationship between government effectiveness and the participation rates in lifelong learning across European countries. The index embraces 15 measures, each of them being assigned a certain weight depending on their perceived accuracy and on the comprehensiveness of information that has been obtained from them⁹. The estimates are based on the results of regular surveys initiated by international and nongov-

⁴ Liberal education for adults (e. g. in Denmark, Finland and other countries) implies a wide variety of formal and informal education programs of professional, enlightening and sociocultural nature.

⁵ <http://ec.europa.eu/social/main.jsp?catId=1223&langId=en>

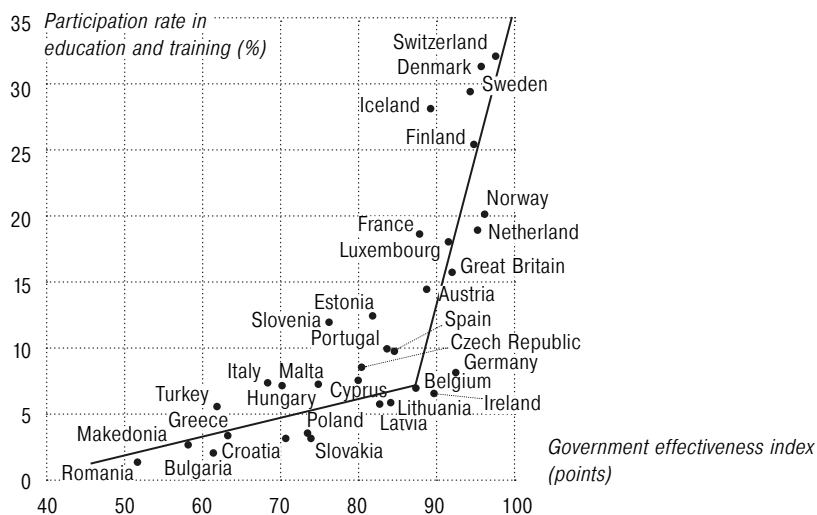
⁶ http://www.eaea.org/media/policy-advocacy/eaea-statements/learning-and-skills-for-adults_final.pdf

⁷ http://www.eaea.org/media/policy-advocacy/eaea-statements/learning-and-skills-for-adults_final.pdf

⁸ Worldwide Governance Indicator <http://info.worldbank.org/governance/wgi/>

⁹ The index is based on the World Bank's Country Policy and Institutional Assessments, African and Asian Development Banks' data, the World Bank's Business Environment and Enterprise Performance Survey findings, the Bertelsmann Stiftung's research, Country Risk Service Reports, the World Economic Forum's Global Competitiveness Reports, IFAD's reports on the agricultural sector's effectiveness, and the IMD World Competitiveness Yearbook.

Figure 8. The relationship between the participation rate in education and training and the government effectiveness index in EU countries in 2015



Sources: Eurostat. Participation rate in education and training (last 4 weeks) by sex and age: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=trng_lfs_01&lang=en

ernmental organizations in various countries to gather public opinion on the quality of governance, the development and implementation of internal policies, the government's ability to govern without radical changes or irregularities in providing public services, the credibility of internal policies pursued by the government, performance of the machinery of government and government officials, their competencies, qualifications, the degree of their independence from political pressure, etc. The surveys take into account opinions of business managers, nonpublic institutions, private credit rating agencies, individuals, government officials and public servants.

Figure 8 presents the relationship between participation in lifelong learning and the government effectiveness index in EU countries in 2015. The countries were grouped into two categories following cluster analysis of governance data that used k-means and Euclidean metric. The first category embraced countries with low-effective governance (under 88 points), where the government has very little impact on the participation rate in education and training. As a result, adult education in these countries relies largely on investment from big corporations that open new plants in their territory. The second category included countries with highly effective governance, which yields a considerably higher participation rate in lifelong learning. In Figure 8, their correlation curve angle is nearly three times greater and their correlation coefficients are very high. Government incentives for continuing education turn out to be more efficient than investors and businessmen's efforts. The dual attitude of company CEOs is easy

to understand: investing in staff development, they can never be absolutely sure that the outcomes of such development will serve the needs of their company and trained employees will not quit.

Government incentives to increase the participation of adults in education and training affect fairly broad layers of population and allow improving the motivation for professional activity, career growth and personal self-fulfillment, thus providing a high level of citizens' satisfaction with their work outcomes and their lives in general. Active adult education incentive policies pursued by executive authorities become a justification for high ratings of overall governance quality.

Lifelong learning systems in Europe

Analysis of over 30 government policies [European Association for the Education of Adult 2016] and strategies [UNESCO Institute for Lifelong Learning 2015] shows that the range of adult education incentives is pretty wide, their nature being directly contingent on GDP per capita.

Countries *with high GDPs* (Norway, Denmark, Luxembourg, Germany, etc.) use integrated measures that include the creation of on-line skill navigators, direct co-funding of programs designed to enhance qualifications of the employed population in various industries, and issuing certificates for learning. They have long developed and actively implemented their independent qualification assessment systems, which take into account certificates for learning and recognize informal education (obtained on-the-job). Their adult education programs mostly focus on labor productivity enhancement, quality management systems, lean production and entrepreneurship.

Training vouchers have become a successful practice in Germany. Employers can obtain up to 20 vouchers annually to cover up to 50% of their expenditure on staff development. There are also special learning bonuses that are distributed among employees with low annual earnings. In addition, the law guarantees that salaries of employees attending training courses during working hours will be preserved fully [Bundesministerium für Bildung und Forschung 2016].

France has launched a system of personal learning accounts (*comptes personnel d'activité*) for anyone at the very start of their career. As of August 2016, 3.3 mln people had activated their accounts to obtain co-funding for training.

Singapore employees' learning activities are also financed directly by the government. The specific feature of training programs in Singapore is their orientation towards hi-tech manufacturing and industrial competencies. Organizations entitled by Singapore's Ministry of Manpower to implement adult education programs include the learning centers of industrial companies, private consulting tech companies, the educational departments of industrial associations, and a large number of specialized centers under polytechnic universities¹⁰. Particular at-

¹⁰ Website of the Ministry of Manpower of Singapore: www.mom.gov.sg/

tention is paid to employees aged over 45, who receive funding for re-training to get ready for a new job at a senior age, while employers are compensated by the government for the expenses they incur in order to retain older workers in the company with new job duties.

A special regulatory framework has been successfully introduced in Denmark to make previously obtained education recognizable. A law has been adopted that allows adults to have the results of previously obtained education or training assessed and to receive detailed certificates that are registered on the dedicated portal called My Skills and Qualifications File¹¹. Educational institutions can assess and recognize previously obtained education and results of advanced training programs, identify courses and competencies required for higher levels of education, and issue certificates of competencies or education in cases where candidate's skills conform to the complete education program requirements.

In Singapore, independent assessments are performed by Singapore Workforce Skills Qualifications (WSQ)¹². It organizes education and advanced training courses, evaluates the key competencies for compliance with the existing framework and standards that companies design based on their expectations about prospective employees, and issues certificates confirming such competencies. All WSQ certificates issued are verified and registered in the e-Cert web database¹³.

Around 200 organizations incorporated in Great Britain are vested with the authority to award qualifications, which they often delegate to assessment centers under the auspices of education service providers.

Chambers of industry, commerce and trade in Luxembourg and Germany reserve the exclusive right to assess graduates' qualifications and certify professional skills and abilities.

Diverse forms of education, various government assistance tools, flexible educational trajectories available in countries with high levels of labor productivity, and labor market responsiveness shape the demand for consulting services in education. The EU has designed a "navigator" portal called Ploteus (Learning Opportunities and Qualifications in Europe)¹⁴ to ensure labor mobility within the European Union. Denmark has been using the Education Guide¹⁵, an electronic reference portal providing relevant information on all education programs available and the labor market situation. The website targets various

workplace-safety-and-health/wsh-service-providers/find-approved-service-providers/find-accredited-training-provider#/
www.minkompetencemappe.dk

¹¹ www.minkompetencemappe.dk

¹² www.ssg.gov.sg/wsqs.html

¹³ <https://e-cert.ssg.gov.sg>

¹⁴ <https://ec.europa.eu/ploteus/>

¹⁵ www.uddannelsesguiden.dk

groups: all citizens, youth, employed adults, parents of school graduates, school students, and learning centers. Using the portal, one can select a suitable education program and institution to ensure the optimal career and personal growth for themselves.

Young start-up entrepreneurs in EU countries are granted government investment and the opportunity to study under business programs, which include not only trainings, workshops and expert consultations but also the opportunity to work on projects under the guidance of mentors, who help young people present their projects to prospective investors and later start working with them. For instance, Hermia Science Park in Finland, apart from education, offers comprehensive project support services, including idea assessment, patent research, establishment of contact with prospective investors, development of business plans that include necessary financial expenses, and preparation for starting a new business (development of recommendations). Once a start-up business model is approved, the second phase comes into play—business development as such. This stage includes specialized training for entrepreneurs, professional consulting services, and financial recommendations for managing public funds and external investments.

Successful integration of liberal education is well exemplified by Oxford University's Department for Continuing Education. Over 15,000 people are enrolled in one or more courses in this department yearly. Graduates from long-term courses obtain university certificates or other types of credits, yet a variety of short-term training courses are available every year for those who look to enhance their professional knowledge and skills without getting any formal qualifications. Such courses may last from one day to a few weeks, and their total number amounts to hundreds.

Liberal education in Finland is provided by people's institutes that offer secondary- and tertiary-level courses as well as learning centers for adults. People's institutes are mostly governed by trade unions, political and religious associations and pursue education programs that do not imply granting any qualification documents upon graduation (the informal sector). Learning centers collaborate with public universities, and their courses are financed from the national or municipal budget, only a small portion of costs (about 15%) being incurred by students.

Countries with *low GDP levels* use government subsidies to organize advanced training for certain groups of the population, and their independent assessment and recognition systems are still in their infancy.

Lithuania has a law on informal education but no coordinator of municipal enforcement has been determined yet, so implementation is a challenge. Polish authorities undertake education funding initiatives for the most vulnerable groups on national and regional scales. They also organize advanced training for managers and cours-

es on entrepreneurship and self-employment. Romania has established a national agency to coordinate adult education projects. However, there has been little agreement on adult education terminology so far, so many experience problems with using educational benefits. No government funding of adult education is available in Romania today. Neither do the systemic funding tools work in Slovakia, with the exception of occasional subsidies for public institutions. Similar spontaneous financing initiatives in Georgia and Ukraine are only undertaken by external donors, while no single national adult education system exists. In Bulgaria, the government only funds formal education of adults through the national network of adult schools, and certificates of on-the-job training are not recognized. Serbian adults obtain primary vocational education and learn basic skills in community-based organizations; the country is in urgent need of a system of providers of technical education for adults.

As for Russia, there is no dedicated law on or conception of adult education. Concepts of continuing education are integrated in the general Law on Education. Public-funded programs in advanced professional training for managers and administrative staff (in education, medicine, culture and entrepreneurship) have become widespread, sometimes involving engineers, too. The government only assists the retired and the unemployed who seek low-paying job opportunities in obtaining vocational qualifications. A national qualification system and independent assessment centers under the direction of employers' associations are being actively developed. Yet, employees still have difficulty having their on-the-job qualifications recognized.

Turkey, France, Sweden and Switzerland showed the fastest growth in the participation rate in education and training over the last decade of observation (from 2006 to 2016). Turkey increased on the index from 2% to 6% by developing a system for independent assessment and recognition of qualifications, including informal ones, launching a system offering educational consulting and employment assistance for the population, and special programs for education and sociocultural integration of refugees and immigrants. France boosted its participation rate from 6% to 19% as a result of providing direct funding of personal learning accounts for those embarking on careers and developing an independent assessment and recognition system which allows recognizing the skills acquired on-the-job and by means of self-education. Sweden made a leap from 19% to 30%, first of all by providing education to immigrants and refugees under direct public grants designed to stimulate the development of new methods of learning, such as language cafés, grammar sessions, speaking practice, movies and open lectures, discussions and meetups, which involve acquisition of competencies in various industries, including cooking and other technologies. Swedes and asylum seekers interested in education can obtain information on educational opportunities through social media or personal contacts with politi-

Table 1. Measures to promote lifelong learning systems in countries with differing GDP rates

Advanced training for employed population	Advanced training for unemployed population	Using education to support business development	Education as a means of socialization ("new literacies", "21st-century skills", self-education and co-learning)
GDP per capita over \$55,000			
Online e-learning platforms, continuing education and employment navigators	Online e-learning platforms, continuing education and employment navigators		
\$35,000–55,000			
Qualification assessment and certificate recognition system. Recognition of informal education (on-the-job training)	Public grants for co-funding of consciously chosen professional education programs. Information resources to facilitate the choice of education providers	Accelerators combining learning with project development and venture investments	Public liberal education under the auspices of universities and autonomous providers
\$14,000–34,000			
Public grants for co-funding of consciously chosen professional education programs (market of education programs)	Flexible job retention programs for mothers and people past retirement age. Combination of consulting, learning and employment	Competition-based education programs (education fairs) for business starters with the opportunity to win a public grant	Enlightenment programs provided by nonprofit organizations, digital platforms for self-learners and volunteers, open universities for the elderly
\$5,000–13,000			
Government and employer co-funding for advanced training. Internal legislation on (conception of) adult education	Government-funded retraining programs for the unemployed and people past retirement age	Short-term courses (in the form of games) on the basics of business literacy for school and college students	Short-term ICT literacy courses for people past retirement age, one-day courses on financial literacy

cians, journalists and language teachers. Switzerland's leadership in the participation rate growth (from 20% to 33%) was provided for by adopting a law on adult education, which outlined the extent of direct educational grants for the employed population in specific industries in accordance with the economic development priorities.

Table 1 presents systematized lifelong learning incentives designed for various groups of the population, depending on the country's GDP.

Governments in countries with low and medium GDP levels look beyond direct assistance to employers in providing their workforce with necessary qualifications and engage massively in enlightenment

and raising the population's basic literacy, improving socialization of disadvantaged groups and immigrants through volunteerism and co-learning systems, providing educational support to people past retirement age, setting up various start-up courses and liberal education systems. Although such programs do not increase labor productivity directly, they still contribute to GDP and complement initiatives designed specifically to promote employee development. According to the approach proposed by Gary Becker, they upgrade the overall human capital, i. e. the important knowledge and skills that can be used and yield returns in different companies [Becker 2003].

Encouragement of the population's learning activity activates the personal resources of every citizen, making them more active and transforming contemplation into action. As a result, society develops a culture of ambition, goal orientation and commitment, and improves its cooperation and communication skills. Homo proactivus is born, ready to respond to external challenges. Being flexible, he is more successful at learning new professional skills and applying the existing ones, thus securing himself a strong position in the labor market [David, Katz, Kearney 2006]. Such a resource turns out to be highly productive for the country as a whole but not for specific employers, as employees who engage in lifelong learning and enhance their own value are more likely to change jobs.

When designing lifelong learning systems, EU countries focus a lot on developing a market of education programs, and their governments engage actively in this process. There are both public-funded and private educational institutions as well as informal education systems in all the countries analyzed, and all of them receive considerable financial and legal support from their government. The EU lifelong learning policies seek first of all to overcome the existing socioeconomic inequalities and provide access to a wide array of opportunities to improve one's professional and educational level, for everyone.

Therefore, adult education is evolving into an independent level of education that affects economic welfare and social stability indicators. Different countries are in different phases of developing their systems of standards and institutions to provide their populations with lifelong learning opportunities. In countries where governments engage little in motivating employers and employees towards professional development, education is mostly provided in terms of staffing for new plants and technology upgrades. General measures on improving the investment climate in such countries attract new investors and lead to an overall improvement in the population's skills as a result of learning. However, investors and employers' activities are not enough to increase the participation rate in education and training. A two- or three-fold increase of the rate—and, hence, a growth in labor productivity—in Russia is only possible through a series of highly-effective governmental initiatives designed to stimulate the market in continuing education and to develop an independent assessment and recognition system.

References

- Bassanini A., Booth A., Brunello G., De Paola M., Leuven E. (2007) Workplace Training in Europe. *Education and Training in Europe* (eds G. Brunello, P. Garibaldi, E. Wasmer), Oxford: Oxford University, pp. 143–178.
- Becker G. S. (2003) *Chelovecheskoe povedenie: ekonomicheskii podkhod. Izbrannye Trudy po ekonomicheskoy teorii* [The Economic Approach to Human Behavior: Selected Works in the Economic Theory], Moscow: HSE.
- Bundesministerium für Bildung und Forschung (2016) *Report on Vocational Education and Training*. Bonn: Bundesministerium für Bildung und Forschung. Available at: www.bmbf.de/media/press/pm_0626-080.pdf (accessed 11 November 2017).
- Busemeyer M. R., Trampusch C. (2005) *The Political Economy of Collective Skill Formation*. Oxford: Oxford University.
- David H., Katz L., and Kearney M. (2006) The Polarization of the U. S. Labor Market. *American Economic Review*, vol. 96, no 2, pp. 189–194.
- Desjardins R. (2015) *Participation in Adult Education Opportunities: Evidence from PIAAC and Policy Trends in Selected Countries*. Background Paper Prepared for the Education for All Global Monitoring Report 2015 “Education for All 2000–2015: Achievements and Challenges”. Available at: <http://unesdoc.unesco.org/images/0023/002323/232396e.pdf> (accessed 11 November 2017).
- European Association for the Education of Adult (2016) *Adult Education in Europe 2016—A Civil Society View*. Available at: http://www.eaea.org/media/policy-advocacy/policy-papers/country-reports_full-report-09-12-2016_without-marks.pdf (accessed 11 November 2017).
- Faure E. (1972) *Learning to Be: The World of Education Today and Tomorrow*. Paris: UNESCO. Available at: <http://unesdoc.unesco.org/images/0000/000018/001801e.pdf> (accessed 11 November 2017).
- Gaponova O., Korshunov I. (2017) Faktory osnovaniya molodykh innovatsionnykh kompaniy v rezultate lokalizatsii tekhnologiy zarubezhnykh korporatsiy [Factors of Founding Young Innovative Companies as a Result of Localizing Foreign Corporations’ Technology]. *Vestnik URFU*, no 2 (16), pp. 208–226.
- Gimpelson V., Kapelyushnikova R., Roshchin S. (2017) (eds) *Rossiyskiy rynek truda: tendentsii, instituty, strukturnye izmeneniya Doklad Tsentra trudovykh issledovaniy Laboratorii issledovaniy rynkatruda NIU VShE* [Russian Labor Market: Trends, Institutions and Structural Changes. Report of the Center for Labor Market Studies and the Laboratory for Labor Market Studies of the National Research University Higher School of Economics]. Available at: http://csr.ru/wp-content/uploads/2017/03/Doklad_trud.pdf (accessed 11 November 2017).
- Goldin C., Katz L. (2008) *The Race Between Education and Technology*. Cambridge, Mass.: Belknap Press of Harvard University.
- Hanushek E., Wessman L. (2007) *The Role of Education Quality for Economic Growth*. Policy Research Working Paper No 4122. Washington, DC: World Bank.
- HSE (2016) *Lifelong Adult Education Attainment Rates. Monitoring of Education Markets and Organizations HSE*. Available at: <http://www.memo.hse.ru/in-d> (accessed 11 November 2017).
- Klyucharev G., Didenko D., Latov Y., Latova N. (2014) *Nepreryvnoe obrazovanie—stimul chelovecheskogo razvitiya i faktor sotsialno-ekonomicheskikh neravenstv* [Lifelong Learning as a Driver of Development and a Factor of Socioeconomic Inequalities], Moscow: Center for Social Forecasting and Marketing.
- Pepin L. (2007) The History of EU Cooperation in the Field of Education and Training: How Lifelong Learning Became a Strategic Objective. *European Journal of Education*, vol. 42, no 1, pp. 121–132.

- Pilz M. (2009) Initial Vocational Training from a Company Perspective: A Comparison of British and German In-House Training Cultures. *Vocations and Learning*, vol. 2, no 1, pp. 57–74.
- Roshchin S., Travkin P. (2015) Dopolnitelnoeprofessionalnoebuchenienarossiyskikhpredpriyatiyakh [Supplementary Professional Education at Russian Enterprises]. *Zhurnal Novoy ekonomicheskoy assotsiatsii*, no 2 (26), pp. 150–171.
- Thelen K. (2004) Review of How Institutions Evolve: The Political Economy of Skills in Germany, Britain, the United States, and Japan. *Industrial & Labor Relations Review*, vol. 59, no 1. Available at: <http://digitalcommons.ilr.cornell.edu/ilrreview/vol59/iss1/88> (accessed 11 November 2017).
- Travkin P., Sharunina A. (2016) The Returns to Training in Russia: A Difference-In-Differences Analysis. *International Journal of Training and Development*, vol. 20, no 4, pp. 262–279.
- UNESCO Institute for Lifelong Learning (2015) *Collection of Lifelong Learning Policies and Strategies*. Available at: <http://uil.unesco.org/lifelong-learning/lifelong-learning-policies-database/collection-lifelong-learning-policies-and> (accessed 11 November 2017).
- UNESCO Institute for Lifelong Learning (2009) *Global Report on Adult Learning and Education*. Available at: http://uil.unesco.org/fileadmin/keydocuments/AdultEducation/en/GRALE_en.pdf (accessed 11 November 2017).

Performance-Based Contracting and Increase in Wage in Preschool Education: Development Strategies, Motivation and Incentives

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Abstract. This article explores opportunities in using performance-based contracting as a tool for internal recruitment and a means of solving problems that preschool educational institutions face in their development. Kindergarten staff underwent little change for decades. Sociological surveys revealed the first shifts in the motivation of preschool teachers after some large-scale salary increase measures in education were undertaken. According to the Monitoring of Education Markets and Organizations, only 60% of preschool teachers wanted to continue working for their institutions in 2007–2011, while 40% felt like changing their jobs. In 2016, 78% of kindergarten teachers did not want to

quit: they had new incentives and an interest in professional growth, their work had become more creative, and interest in work had come to the fore. The findings give reason for considering further support of the salary reform feasible in order to change the nature of preschool teaching as a strategic vector of development in this education sector. As the course of the preschool teacher salary reform has been analyzed and the major trends in changes in institutions that applied performance-based contracting in 2012–2016 have been identified, the conclusion is made that further implementation of performance-based contracts is possible provided that performance criteria recommended “from above” are specified wisely at the level of individual educational institutions and adjusted to kindergarten-specific development strategies. Personnel policies are becoming a resource in the transformation of preschool education content and its orientation towards the development of 21st-century skills.

Keywords: performance-based contracting, preschool education, motivation of preschool teachers, remuneration of labor, effectiveness criteria.

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There has been quite a strong focus on the teacher pay reform in both national policies and research over the last decade. However, publications in this field have mostly dealt with institutions of secondary and higher education [Abankina 2009; Klyachko, Avraamova, Loginov 2014; Kurbatova, Levin 2013; Kuzminov 2011], virtually ignoring the situation in kindergartens. It was not until fairly recently that the correlation between teachers' motivation and compensation came to the foreground in education research, namely in 2012, when a single modernization policy for all public industries was adopted. The policy introduced quantitative benchmarks at the national level to increase salaries in education, science and healthcare and proposed a unified vision of performance-based contracting as a remuneration system for public industries where salary size is contingent on employee performance assessment¹.

Despite the common goals and principles of transforming the compensation systems in public industries, it is appropriate to analyze the effects of the reform individually for each segment of the education system, paying attention to specific aspects of teaching at different stages, peculiarities of team building, and formal and informal working principles. The special nature of preschool education lies primarily in the specific methods it uses to assess "output results": this is the only education stage that has no universally acknowledged system of assessment criteria. While the performance of a secondary or trade school teacher can be universally evaluated in the form of USE (Unified State Examination) scores or student compliance with the recognized standards in WorldSkills competitions, there is no such evaluation system in preschool education. Besides, the professional activities of preschool teachers differ fundamentally from those of secondary or college teachers: teaching in a kindergarten is characterized by teamwork (cooperation between teacher and junior teacher in one group), inseparability of education, nurturing and caring processes, close contact with parents, and working in a small, almost entirely female environment with specific organizational culture and values.

No agreement has been achieved yet on the effects of performance-based contracts in the public sector, educational institutions in particular. There are studies confirming the positive effects [Derkachev, Zinovyev 2016] as well as those that reveal negative impacts of the reform [Belyavina 2016]. The pros and cons of the transformations are described in detail, for instance, by Bruijn [2005]. The differences in findings are explained by the plurality of interests of those affected by the reform.

¹ Edict of the Government of the Russian Federation No. 2190-p "Program for Stepwise Improvement of the Compensation System in Public (Municipal) Institutions for 2012–2018."

Foreign researchers insist that effects of education reforms should be analyzed with due regard for the course of their implementation, involvement of various actors (politicians and educational institutions) in such implementation, and perceived friendliness of the existing formal and informal institutions to reform promotion. Michael Fullan argues that “the result of a reform depends on how its objectives are understood by direct education system participants, the intensity and nature of their actions” [Fullan 2006]. As Larry Cuban writes, it is not education authorities but schools that introduce new approaches, so they are the first to actually decide whether a specific reform will be accepted or rejected [Cuban 1998]. Raisa Belyavina, while analyzing the reform implementation, investigates into how and why schools adjust this reform as well as the logic behind the process [Belyavina 2016].

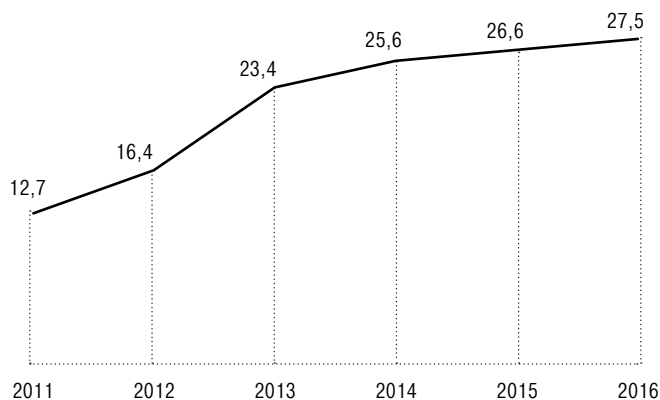
This approach to evaluating the effects of reforms is used in this study to analyze the institutional context of introducing performance-based contracting in Russian preschool education in 2012–2016 and to determine possible development vectors of the initiated labor compensation reform. We suggest that the primary task at this stage is to create a system of target performance indicators that are easily measurable, objective and understandable for teachers. That is why the final part of this paper delves into opportunities in using performance-based contracting as a tool of internal personnel policy and a means of solving problems that preschool educational institutions face in their development.

Diverse methods of scientific knowledge systematization and structuring as well as analytical tools are used to achieve the research objectives: analysis of statistics and financial statements of government agencies and educational institutions, analysis of sociological survey results, and content analysis of regulatory documents and (applied) research articles. References to sources of information and descriptions of the methods used are provided as the article unfolds.

There is no universal understanding of performance-based contracting in academic or professional publications, so the interpretation used in this article should be explained first. Performance-based contracting is regarded here as defined in a national regulatory document, namely the Program for Stepwise Improvement of the Compensation System in Public (Municipal) Institutions for 2012–2018,² i. e. as both an increase in teachers’ salaries and a performance-related pay system. Meanwhile, it is worth remembering that preschool teachers formally remain employed under open-ended contracts, so performance-based contracting does not suggest any other reasons for dismissing employees or terminating employment relations with them in addition to those stipulated by the labor law. Unlike in higher education, where teachers sign fixed-term contracts following a vacancy

² <http://www.iroski.ru/docs/doc-26-11-2012-2190.pdf>

Figure 1. **Average monthly salary of a preschool teacher** (1,000 rubles)



Source: Rosstat data (form ZP-Obrazovanie in 2013–2016, form 85-K in 2011–2012)

competition, the preschool education system has preserved the tradition of hiring employees under open-ended employment contracts. Thus, the notion of performance-based contracting has a metaphorical meaning in kindergartens: rather than switching to the new remuneration system, they add an incentive to salaries of teachers hired on a “permanent” basis, the size of which is contingent on employee performance.

1. The context of introducing performance-based contracting in preschool education

Analysis of the institutional transformations that preschool education has seen in the last five to seven years reveals that the system provided a favorable environment for introducing performance-based contracting.

First, it was in preschool education that the transition to performance-related pay, which had hardly been used in kindergartens before, coincided with a hefty pay rise in 2012–2013 (Fig. 1). According to the Russian Federal State Statistics Service (Rosstat) (form 85-K), the face value of labor costs in preschool institutions increased twice in five years, from 204.5 bln rubles in 2010 to 437.8 bln rubles in 2014. In comparison, the introduction of the new labor compensation system in secondary education began with 21 regions in 2007. Ten more regions—participants in integrated education modernization projects—joined the reform in 2008–2009, and the rest caught up in 2010. The pilot regions which launched the new system in 2007–2009 had to secure a teacher pay rise mostly at the cost of their internal reserves and optimization—it was only in 2012–2013 that the president signed a large-scale salary rise in secondary education. This way, the changes in salary formulae (the introduction of incentives) coincided with the pay rise in preschool education.

Second, the labor compensation reform in kindergartens came with changes in funding: the partial shift of funding to the regional

level, the launch of per capita formulae, and the expansion of the financial autonomy of educational institutions. As a result, the liability for funding preschool institutions (in particular, labor costs and procurement of textbooks, study guides, learning tools, games and toys) moved from the municipal level to the level of subjects of the Russian Federation in 2014. Relevant regional subsidies are calculated using per capita formulae. Although the redistribution of preschool education funding liabilities did not always meet sufficient funding in some regions [Khokhlova, Ruzhnikova 2014], it served as a good institutional measure to promote transparency in the identification of expenses in preschool education (due to per capita subvention formulae) and to improve competition among kindergartens.

There has been a significant increase in financial autonomy of preschool institutions recently. Kindergartens incorporated as autonomous and budgetary organizations are entitled to plan their expenditures to the extent of per capita government subsidies they are granted. The proportion of autonomous and budgetary institutions in preschool education keeps growing, as evidenced by changes in government spending on subsidies to such organizations. As the Federal Treasury reports, funding on subsidies to autonomous, budgetary and other noncommercial organizations providing preschool education services accounted for 83% of the consolidated spending on preschool education in all subjects of the Russian Federation in 2016, as compared to 81% in 2015, 71% in 2014, and 56% in 2013. The figures speak volumes about the spread of financial and economic independence and taking on responsible financial management as a leadership philosophy among preschool education institutions.

Third, the network of kindergartens was undergoing a fundamental change as performance-based contracting was introduced. Four hundred thousand new places had to be created yearly in 2013–2014 in order to meet the goal of providing 100% accessibility of preschool education for children aged 3–7. New kindergartens with brand new teams and principals were commissioned in regions. Performance-related pay policies were adopted on presenting such organizations in the education market so as to motivate staff and build a positive image.

As we can see, the institutional situation in preschool education in 2012–2016 was favorable for inculcating performance-based contracting, thanks to the massive increase in teacher pay concurrent with changes in compensation formulae (the introduction of incentives and performance assessment criteria), the expansion of financial autonomy, and a more transparent allocation of funding.

2. Reform process, emerging barriers and limitations

Problems that limited and inhibited the use of performance-related pay principles emerged in the course of reformation. First of all, inconsistency and disagreements in the conceptual framework as well as in the signals received by reform implementers, i. e. regional and municipal authorities and educational institutions, and from the reform de-

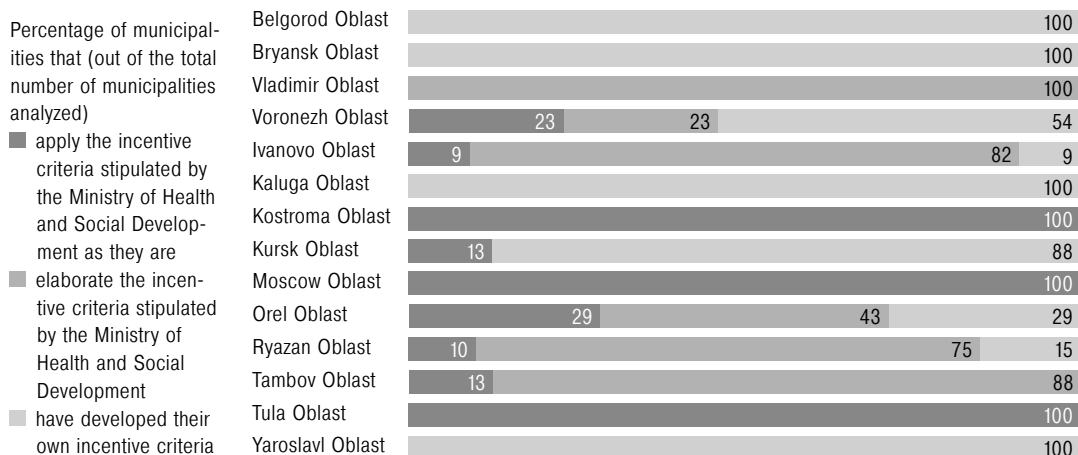
velopers, i. e. federal executive agencies, became obvious. This can clearly be seen from the recommendations on incentive improvement that are contained in two federal documents: the Program for Step-wise Improvement of the Compensation System in Public (Municipal) Institutions for 2012–2018 (hereinafter referred to as the Program) and the Unified Recommendations on Establishing Compensation Systems for Employees of National and Municipal Agencies at Federal, Regional and Local Levels for 2017³ (hereinafter referred to as the Unified Recommendations). According to the Program, “the system of incentives will be improved <...> through canceling non-performance-based compensation”; “employee performance indicators and criteria are poorly developed, and their implementation is largely formal. Many employee compensation systems have been sticking to previously applied incentives that appear to be low-effective in the present-day context (e. g. good fulfillment, labor intensity, labor quality, etc., without specifying the measurable parameters).” At the same time, the Unified Recommendations focus national and municipal organizations on applying the list of incentives approved at the federal level by the Order of the Ministry of Health and Social Development No. 818 of 12/29/2007. The list is common for all public industries and thus includes four types of incentives: (a) for labor intensity and high performance, (b) for labor quality, (c) for the length of continuous service, and (d) bonuses⁴. Therefore, the list contains incentives that the Program identifies as ineffective, so these two documents provide no clear picture of how incentives may be improved.

In the course of reforming, the responsibility for the design of performance criteria was actually imposed on educational institutions as no single approach to defining performance had been offered at the national level. Exemplary regulations on labor compensation adopted by regional and municipal authorities for subordinate organizations in a number of regions use such incentive criteria as “labor intensity” or “quality” without indicating any exact measurable indicators. As educational institutions receive highly generalized recommendations from their founders, they often use the same wordings in local remuneration-related documents. As a result, the meaning proper of the per-

³ The Unified Recommendations on Establishing Compensation Systems for Employees of National and Municipal Agencies at Federal, Regional and Local Levels for 2017 were approved by the Resolution of the Russian Trilateral Commission for the Regulation of Social and Labor Relations dated December 23, 2016 [*Rossiyskaya Gazeta*, national iss. no 7164 (296), December 29, 2016].

⁴ Order of the Ministry of Health and Social Development No. 818 of December 29, 2007 (as amended on 09/17/2010) “On Approving the Types of Incentives in Federal Budgetary, Autonomous and Government Institutions and Explicating the Methods of Calculating Incentives in Such Institutions.” Available at: <http://legalacts.ru/doc/prikaz-minzdravsotsrazvitiya-rf-ot-29122007-n-818/>

Figure 2. **Ways of establishing incentive criteria for preschool teachers in recommendations on labor compensation developed by certain municipalities in the CFD**

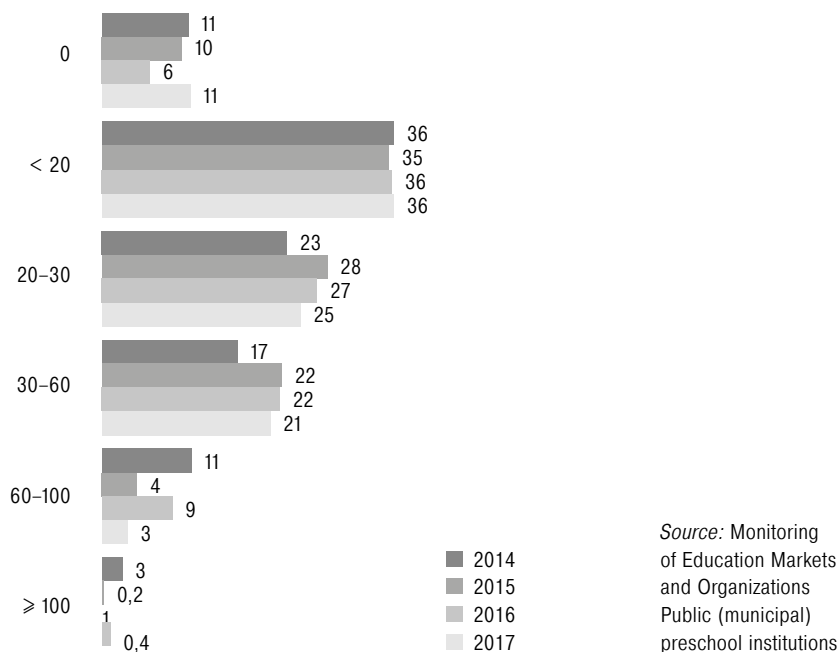


formance-based contracting philosophy becomes diluted, employees finding the stimuli and criteria of the variable component of their salaries vague and dubious.

Differences in the ways that regions determine incentive criteria for preschool teachers can be illustrated through content analysis of municipal regulatory documents that stipulate preschool teacher pay policies (Fig. 2). Content analysis was carried out in 2017 for municipalities of the Central Federal District based on Consultant Plus data. Incentive criteria were analyzed for 14 regions of Russia, in which the total of 157 municipal documents containing recommendations on preschool teacher compensation policies had been collected⁵. The analysis revealed the following types of practices: (a) municipalities use the generalized recommendations from the Order of the Ministry of Health and Social Development No. 818—“labor intensity”, “labor quality”, “length of service” and “bonuses”—without specifying the parameters to measure; (b) municipalities elaborate the generalized recommendations; (c) municipalities introduce incentive criteria of their own. As can be seen from Figure 2, the practices of establish-

⁵ Since the Consultant Plus resources did not allow collecting documents from every municipality, the subjects of the Russian Federation included in the Central Federal District were covered by content analysis to varying extents. The following number of municipal acts was analyzed: 10 in Belgorod Oblast, 10 in Bryansk Oblast, 9 in Vladimir Oblast, 13 in Voronezh Oblast, 11 in Ivanovo Oblast, 10 in Kaluga Oblast, 5 in Kostroma Oblast, 8 in Kursk Oblast, 27 in Moscow Oblast, 7 in Orel Oblast, 20 in Ryazan Oblast, 8 in Tambov Oblast, 12 in Tula Oblast, and 7 in Yaroslavl Oblast.

Figure 3. **The proportion of incentives in salaries of teachers in public (municipal) kindergartens** (% of respondents)



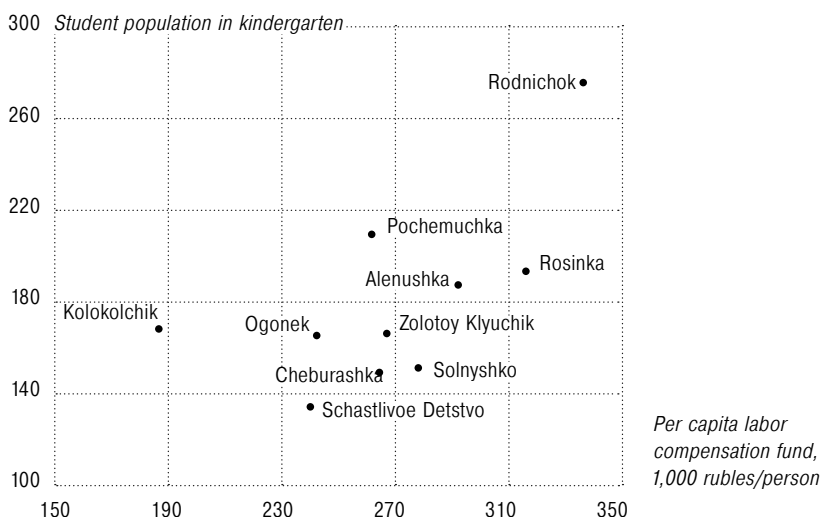
ing (detailed) internal incentive criteria and using the generalized recommendations are distributed more or less equally among institutions.

The introduction of performance-based contracting implied that performance-based incentives would strengthen the differentiation in salaries. However, the methodological recommendations did not provide a clear answer in whether to raise salaries for all teachers or only for the most effective ones. The pay rise was in fact perceived in regions and municipalities as a social measure applicable to all of the teaching staff, a kind of repayment of “debts to teachers” and compensation for low salaries in the previous years—not only as incentives for performance, which were originally designed to increase salaries for the most effective teachers as a bonus for quality, not the volume of work done.

The degree of differentiation in preschool teacher salaries comes under the cognizance of principals, so the gap could either widen or reduce across institutions. Surveys conducted as part of the Monitoring of Education Markets and Organizations show that the overall differentiation in preschool teacher salaries has changed little since performance-based contracting was introduced (Fig. 3).

Unequal opportunities in building up incentive compensation funds in large and small kindergartens became another barrier to the extensive introduction of performance-based contracting in pre-

Figure 4. **The correlation between per capita labor compensation funds and student population in kindergartens of Kaliningrad Oblast (all within the same municipality)**



Source: Based on statistical form 85-K, 2014

school education. Using the size effect, large institutions can afford to establish higher incentives than small ones. Figure 4 gives examples of correlations between the size of kindergarten (number of students) and compensation funds per teacher: the more children that are enrolled, the higher per capita funding. Obviously, incentives in larger kindergartens may play a more crucial role in motivating teachers to perform better.

Unequal compensation fund opportunities are inherent to the kindergarten network structure, as preschool institutions differ in student population. Mechanisms of competition in preschool education are limited because proximity to home remains the key criterion in choosing a kindergarten for most parents (61% in 2016, according to the Monitoring of Education Markets and Organizations). For this reason, performance-based contracting formulae must be different in large and small educational institutions.

Promotion of performance-based contracting has also been largely inhibited by poor regional funding. This factor is of special importance for preschool education, where public subsidies constitute 85–88% of all revenues. Private contributions to kindergartens consist almost entirely (95%) of fees paid by parents. Such fees have increased over the recent years, which did not affect, however, the proportion of private contributions in revenues of preschool institutions. In addition, private funds play a near-zero role in raising kindergarten teacher salaries (accounting for less than 1% of labor compensation funds).

Table 1. Subjects of the Russian Federation broken down by the ratio of preschool teacher pay to average salaries in secondary education (Number of subjects for 12 months)

	2013	2014	2015	2016
≥ 100%	25	47	37	39
95–99%	36	29	38	32
90–94%	12	4	9	8
80–89%	9	2	1	5
70–79%	0	1	0	1
60–69%	1	0	0	0

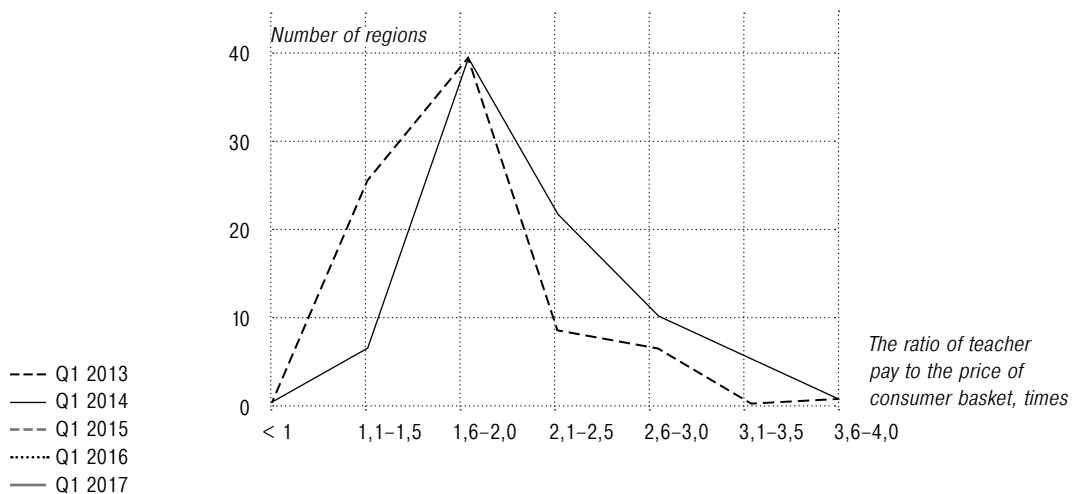
Poor regional funding and ineffective budget planning [Akindinova, Chernyavsky, Chepel 2016] are among the reasons why most regions did not succeed in bringing preschool teacher salaries to the level of average teacher pay in secondary education, as required by the presidential decree, despite all the effort (Table 1).

How kindergarten employees perceive the effects of introducing performance-based contracting in preschool education could not remain unaffected by the decrease in the purchasing power of teacher salaries in 2015–2017 after a pay rise had come into view in 2014. Figures 5 and 6 demonstrate the correlation between preschool teacher pay and the price of consumer basket, which reflects the purchasing power of the salary. The distribution curve shifted rightwards in 2014, which means that the purchasing power of preschool teacher salaries increased in more regions than in 2013 (Fig. 5). However, it shifted back to the left in 2016–2017, meaning that purchasing power dropped almost to the level of 2013 (Fig. 6).

The introduction of performance-based contracting was accompanied by other changes in preschool education as well, which affected the process and perception of the reform. Measures to improve accessibility of preschool education for children aged 3 and older entailed an increase in teacher workload: as groups were growing in size (according to the Monitoring of Education Markets and Organizations, an average kindergarten group comprised 26 children in 2017, as compared to 24 in 2014), the average number of children per teacher increased (from 8.9 in 2010 to 11.2 in 2016). No reduction of preschool education staff was observed, with the exception of administrative and medical personnel⁶. Preschool teachers often tend to associate a higher workload with a pay rise,

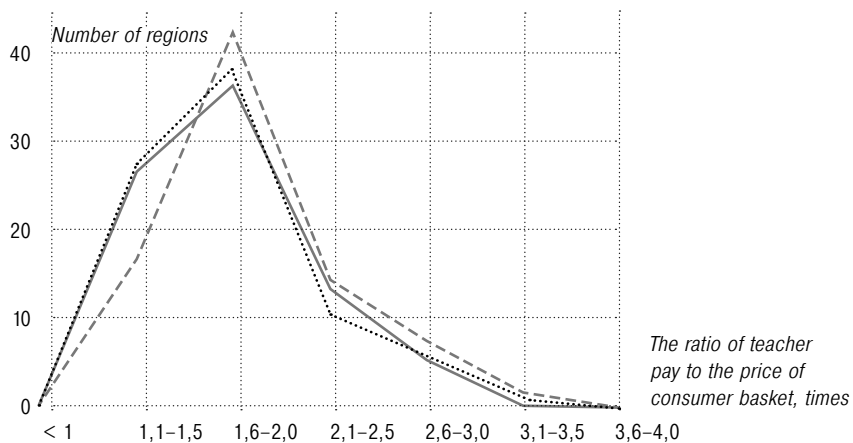
⁶ According to statistical form 85-K, the overall number of employees in pre-

Figure 5. **Subjects of the Russian Federation broken down by the ratio of preschool teacher pay to the price of consumer basket (times) in 2013–2014**



Source: Calculations based on Rosstat data

Figure 6. **Subjects of the Russian Federation broken down by the ratio of preschool teacher pay to the price of consumer basket (times) in 2015–2017**



school institutions was around 1,494,000 in 2011 and 1,520,000 in 2015, including:

- administrative staff: 79,000 in 2011 and 75,000 in 2015;
- teaching staff: 613,000 in 2011 and 644,000 in 2015 (including teachers: 475,000 in 2011 and 501,000 in 2015);
- junior teachers: 178,000 in 2011 and 184,000 in 2015;
- teaching assistants: 120,000 in 2011 and 128,000 in 2015;
- service staff: 468,000 in 2011 and 472,000 in 2015;
- medical staff: 36,000 in 2011 and 17,000 in 2015.

so such reform conditions are perceived negatively by the participants.

This way, the introduction of performance-based contracting in preschool education encountered a number of institutional and financial limitations, and the conditions turned out to be unequal in kindergartens of different sizes. These barriers could inhibit further development of the reform if it had not been for the important positive transformations in how preschool teachers assessed their work, sociological surveys found out.

3. Attractiveness of the kindergarten teacher job as seen by preschool teachers

Very little attention was paid to motivation of preschool teachers for quite some time. Meanwhile, employee motivation plays a crucial role at the stage of transition to performance-based contracts, helping implement a personnel policy designed to provide quality preschool education which is aligned with present-day requirements and challenges.

Preschool teachers were paid low salaries, 50% of the average regional salaries in most regions at best. This sector of education did not receive any strong support from the national government, and the workforce was ageing as little to no young blood was flowing into the profession. Unlike school teachers who were engaged actively in systemic reforms starting from 2006, preschool teachers never received any meaningful signals that would boost their motivation and interest for work. The situation underwent a 180-degree turn in 2012, when the president issued decrees on raising pay for preschool teachers.

According to the Monitoring of Education Markets and Organizations, only 60% of preschool teachers wanted to continue working for their institutions in 2007–2011, while 40% felt like changing their jobs. However, only 2% of the latter had viable alternative career options, while the rest intended to quit but made no effort in this direction, either being convinced that they would fail to find another job or being about to retire. It is easy to imagine the state of mind in a teaching team where 40% are going to quit but never make the move. They are hard to rely upon in solving education quality enhancement problems, while limited resources leave few opportunities for incentives.

The situation changed radically in 2013, according to the Monitoring of Education Markets and Organizations. Over 76% of preschool teachers reported that they were eager to keep their jobs. The proportion of those who had found an alternative job dropped to 0.9%, making this type of employee a rare phenomenon. The number of teachers planning to quit but making no effort decreased by half. It was only the percentage of employees about to retire that remained more or less the same. This way, the teaching staff of preschool education institutions had developed a fundamentally new motivational structure.

Surveys showed that the observed positive dynamic in the motivational structure of teaching staff was maintained after 2013, which means that the transformation was persistent. Seventy-eight percent

of public preschool teachers (81% in private kindergartens, for comparison) did not want to change their jobs in 2016.

Those changes were induced first of all by implementing the Decree of the President of the Russian Federation No. 597 of 05/07/2012, which resulted in much higher average salaries in preschool education. Kindergarten teachers were given an incentive to keep working; in addition, most employees in every economic sector were interested in keeping their jobs during the severe economic crisis.

4. Performance-based contracting as a tool of kindergarten personnel policy

Given the ambiguous institutional mechanisms of introducing performance-based contracting and the scarcity of public funding, granting educational institutions more freedom in pursuing performance-related pay policies (in establishing incentive criteria, determining the size of incentives, etc.) seems to be the only way to keep the reform going.

When analyzing the labor compensation reform, it appears feasible to shift the focus to the local level and recognize the paramount role of educational institutions in further reforming, a number of studies have found. The foreign research community has developed a separate field of study devoted to leadership in education. Studies in this area have resulted, among other things, in acknowledging the key role of educational leaders in implementing strategic projects and development programs. Researchers in this field assess how various leadership styles typical of leaders of specific educational institutions tell on the effectiveness of such organizations (for a comprehensive review of studies on leadership in education and its influence on institution effectiveness, see [Abu-Hussain 2014]). Michael Fullan believes that “all the major studies in school innovations and efficiency demonstrate that principals have a tremendous influence on whether a change will take place” [Fullan 2006]. Paul Berman and Milbrey Wallin McLaughlin have found that projects that receive active principal’s support are more likely to be implemented successfully [Berman, McLaughlin 1977].

Analysis of the introduction of performance-based contracting at the local level with kindergarten teachers—as a tool of internal personnel policy—may reveal its significant practical benefits in terms of promoting the reform and overcoming the existing barriers.

First, funding for performance-based contracts and incentive formulae can be managed better at the level of individual kindergartens. Educational leaders are on their own when it comes to evaluating the labor compensation fund opportunities and the size of incentives as well as aligning the latter with incentive criteria.

Second, incentives can be specified more precisely at the level of educational institutions, i. e. what should be classified as incentives and which ones are more effective for developing the kindergarten, improving its staff and enhancing the quality of educational and other types of services provided. In a situation where no unambiguous instructions on incentives can be obtained “from above” (from national

authorities), educational institutions together with experts from municipal and regional government agencies develop the best possible criteria for incentives to stimulate change and understanding of the reform by its participants. Michael Fullan considers this process to be a prerequisite for reform success: "A reform will never strike root until its meaning is captured by the participants" [Fullan 2006].

5. Research support for introducing performance-based contracting

Content analysis of abstracts to publications that have "performance-based contracting" in their titles was conducted using eLIBRARY.ru resources in order to find out how attitudes towards and perceptions of performance-based contracting have changed in the scientific and expert community. The sample included papers devoted to performance-based contracting in preschool, secondary and supplementary education for children as well as those analyzing the course of the reform in all public industries. Publications on performance-based contracting in tertiary education were not included in the analysis. The sample was comprised of 142 articles, each of which was assigned a conceptual category or two to capture their basic content. The following categories were used:

- Analysis of the concept of "performance-based contracting" and overview of regulatory documents. This category was assigned to articles describing the regulatory documents that define performance-based contracting and the introduction prerequisites as well as articles devoted to theoretical interpretations of "performance-based contracting" (in terms of economics, law, educational management, etc.) and related concepts ("effectiveness", "performance", "performance criteria", etc.);
- Description of problems associated with introducing performance-based contracting. The category was assigned to papers identifying practical problems, challenges and barriers in transition to performance-based contracting in state-funded organizations;
- Criticism of performance-based contracting. The category was assigned to publications whose authors point to the impracticality of transition to performance-based contracting in their abstracts;
- Overview of effects of performance-based contracting. The category was assigned to articles that investigate the dynamic of statistical indicators which describe the level of salaries, budget expenditures and characteristics of organizations signaling the first effects of introducing performance-based contracting;
- Description of specific experience of introducing performance-based contracting. The category was assigned to papers summarizing the experience of individual institutions that introduced performance-based contracts;

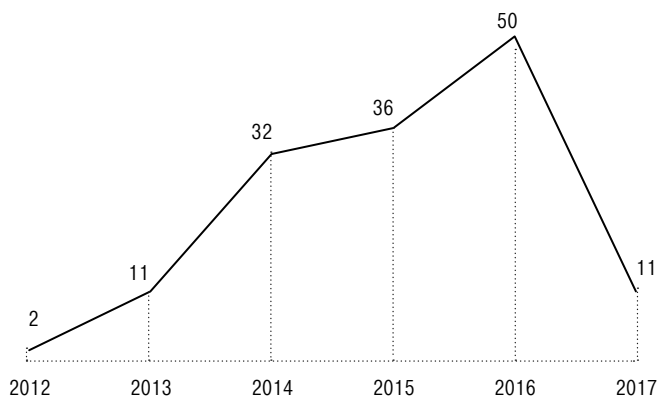
- Sociological surveys. The category was assigned to publications presenting the findings of sociological surveys designed to identify changes caused by the introduction of performance-based contracting;
- Recommendations and possible approaches. The category was assigned to articles offering recommendations, advice or specific models for introducing performance-based contracting.

The number of publications on performance-based contracting in the preschool, secondary and supplementary education of children as well as in the public sector in general has been growing gradually since 2013, when the relevant national documents were adopted: only two publications were found with the specified search criteria in 2012, as compared to 50 research papers published in 2016 (Fig. 7). The subjects have changed significantly over this period. While all the publications of 2012 were dedicated to understanding the concept of performance-based contracting and interpreting the relevant regulatory documents, the percentage of such articles was reducing during the years that followed (45% in 2013 and only 25% in 2016). The proportion of papers describing specific experiences in introducing performance-based contracting and specific models for its introduction had increased by 2016–2017 (remaining rather low though): publications in these two categories made up a total of 22–23% of all articles in the field published by 2013–2014 and 30% of all publications accumulated by 2017. Therefore, the methods of reform implementation are developed step by step at the level of the actual implementers.

Using performance-related pay principles as a tool of employment policy in kindergartens must be based on considering the specific aspects of preschool education and the job of kindergarten teacher. Yet, few Russian studies offer methods of applying knowledge on preschool teachers' values and motivation and the mechanisms of kindergarten staff enhancement in management of such institutions.

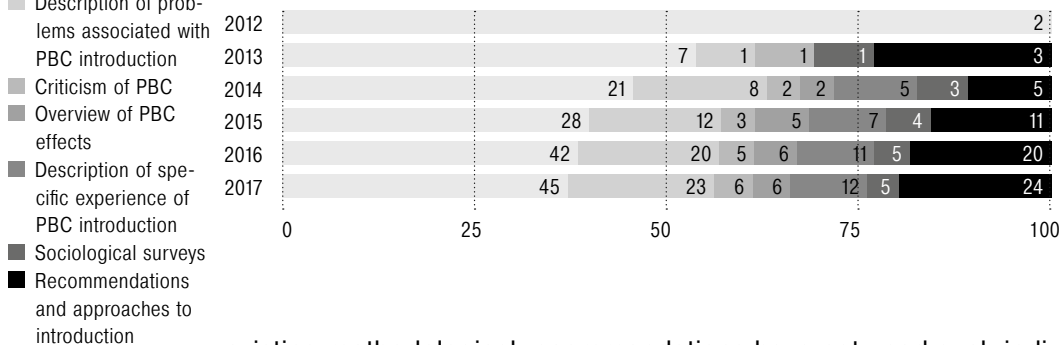
A recent study conducted in a Magnitogorsk kindergarten used standardized methods to observe teacher motivation in the context of introducing performance-based contracting. The authors found that a productive and amicable relationship with colleagues and a positive psychological climate are the most important criteria of teacher job satisfaction [Minaeva, Bagautdinova 2015]. These findings are consistent with the results of preschool teacher surveys conducted as part of the Monitoring of Education Markets and Organizations: a healthy work environment and convenient working hours were named among the main job satisfaction criteria in 2016 by over half of the respondents in both public (municipal) preschool institutions and private kindergartens [Abankina, Rodina, Filatova 2017]. All these results demonstrate the huge potential in using criteria reflecting collective job performance as indicators of teacher effectiveness. However, the

Figure 7. **The number of publications on eLIBRARY.ru that have “performance-based contracting” in their titles and study the introduction of performance-based contracting in institutions of preschool, secondary or supplementary education for children or in the public sector in general**



- Analysis of the concept of PBC and overview of regulatory documents
- Description of problems associated with PBC introduction
- Criticism of PBC
- Overview of PBC effects
- Description of specific experience of PBC introduction
- Sociological surveys
- Recommendations and approaches to introduction

Figure 8. **Articles that have “performance-based contracting” in their titles, published by the respective year, broken down by their content**



existing methodological recommendations have not used such indicators in any way so far⁷.

Based on search queries on eLIBRARY.ru

⁷ Recommendations on establishing performance indicators for employees of educational institutions are contained in the Letter of the Ministry of Education and Science of the Russian Federation No.АП-1073 “On Design of Performance Indicators” of June 20, 2013. The following areas of preschool teacher performance indicator design are offered: (a) implementation of additional projects, (b) organization of (participation in) system research, monitoring of students’ individual attainment, (c) implementation of measures to ensure communication with parents, (d) participation in the development and implementation of the main education program, (e) organization of physical education, health and sport activities, (f) working with children from socially disadvantaged families, and (g) design of education infrastructure

6. Conclusion Analysis of the institutional context of introducing performance-based contracting in preschool education in 2012–2016 and the review of problems encountered by the labor compensation reform lead to the conclusion that the leadership role should be vested in educational institutions as well as regional and municipal education authorities in order to keep the reform going. This level is where the most productive approaches to the design of employee performance criteria and types of incentives can be developed. Performance-based contracting models proposed by educational institutions, principals and employees as their end users appear to be the most viable.

It seems appropriate to support various discussions in the professional community on the accumulated experience of transition to performance-based contracting as well as cross-regional and cross-municipal meetings to allow educational leaders to share their best practices. Besides, it is necessary to carry out local experiments with different performance-based contracting models, using both individual and collective performance criteria. Such experiments should feature control and experimental groups of teachers involved in the reform, so that different models can be compared and the findings effectively analyzed, scientifically justified and presented to the professional community.

Given the emerging increase in preschool teacher pay satisfaction, it would be wise to sustain the effort to increase teacher pay after 2018, i. e. after the term specified in the presidential decree on raising salaries in the public sector expires. It is vital to continue improving spending efficiency in managing allocated subsidies with due regard for national law requirements in order to allow for a financial opportunity to increase salaries in preschool education and build up sufficient incentive compensation funds in kindergartens.

- References**
- Abankina I. (2009) Issledovanie rezultatov i effektivov vvedeniya novoy sistemy oplaty truda uchiteley [Studying Results and Effects of a New Remuneration System for Teachers]. *Voprosy obrazovaniya / Educational Studies*. Moscow, no 4, pp. 153–169.
- Abankina I., Rodina N., Filatova L. (2017) Motivatsii, povedenie i strategii vospitateley obrazovatelnykh organizatsiy, realizuyushchikh programmy doskolnogo obrazovaniya, na rynke doskolnogo obrazovaniya [Motivation, Behavior and Strategies of Preschool Teachers in the Preschool Education Market]. *Informatsionny byulleten Monitoringa ekonomiki obrazovaniya*, no 12 (111), Moscow: HSE.
- Abu-Hussain J. (2014) Leadership Styles and Value Systems of School Principals. *American Journal of Educational Research*, vol. 2, no 12, pp. 1267–1276.
- Akindinova N., Chernyavsky A., Chepel A. (2016) Regionalnye byudzhety v usloviyakh krizisa: mozjno li dostich sbalansirovannosti? [Regional Budgets in a Crisis: Is Balance Possible?]. *Voprosy ekonomiki*, no 10, pp. 31–48.

elements. Most of these activities imply working independently to achieve individual, not collective performance.

- Belyavina R. (2016) Pochemu finansovoe stimulirovanie nevygodno: sovershenstvovanie kachestva prepodavaniya ili torpedirovanie reform v Kyrgyzskoy Respublike [Why Incentives Don't Pay: Introducing Bonus Pay in the Kyrgyz Republic and the Undoing of Reforms]. *Voprosy obrazovaniya / Educational Studies*. Moscow, no 2, pp. 40–61. DOI: 10.17323/1814–9545–2016–2–40–61
- Berman P., McLaughlin M. W. (1977) *Federal Programs Supporting Educational Change*. Vol. VII: Factors Affecting Implementation and Continuation. Santa Monica, CA: Rand Corporation.
- Bruijn H. de (2005) *Upravlenie po rezultatam v gosudarstvennom sektore* [Managing Performance in the Public Sector], Moscow: Institute for Complex Strategic Studies.
- Cuban L. (1998) How Schools Change Reforms: Redefining Reform Success and Failure. *The Teachers College Record*, vol. 99, no 3, pp. 453–477.
- Derkachev P., Zinovyev A. (2016) Byl li uspeshen perekhod na effektivny kontrakt v organizatsiyakh professionalnogo obrazovaniya Moskovskoy oblasti? [Was the Transition to Performance-Based Contracting in Moscow Oblast Institutions of Professional Education Successful?]. *Obrazovatel'naya politika*, no 3, pp. 85–96.
- Fullan M. (2006) *Novoe ponimanie reform v obrazovanii* [The New Meaning of Educational Change], Moscow: Prosveshchenie.
- Khokhlova N., Ruzhnikova A. (2014) Otsenka vliyaniya pereraspredeleniya polnomochiy po obespecheniyu doskolnogo obrazovaniya na regionalnye i mestnye byudzhety v Sibirskom federalnom okruge [Assessing the Impact of Redistributing Preschool Education Funding Powers on Regional and Municipal Budgeting in Siberian Federal District]. *Izvestiya Baykalskogo gosudarstvennogo universiteta*, no 6, pp. 15–24.
- Klyachko T., Avraamova E., Loginov D. (2014) Uchitelskaya zarplata i effektivnost raboty shkoly [Teacher Salaries and School Effectiveness]. *Narodnoe obrazovanie*, no 5, pp. 26–38.
- Kolesnikova E. (2016) Pedagogi chastnogo i gosudarstvennogo doskolnogo obrazovaniya: status gruppy i perspektivy razvitiya [Teachers in Private and Public Preschool Education: Social Group Status and Development Prospects]. *Sotsiologicheskii zhurnal*, vol. 22, no 1, pp. 114–132.
- Kurbatova M., Levin S. (2013) Effektivny kontrakt v sisteme vysshego obrazovaniya RF: teoreticheskie podkhody i osobennosti institutsionalnogo proektirovaniya [Performance-Based Contracting in Russian Higher Education: Theoretical Approaches and Peculiarities of Institutional Design]. *Journal of Institutional Studies*, vol. 5, no 1, pp. 55–80.
- Kuzminov Y. (2011) Akademicheskoe soobshchestvo i akademicheskie kontrakty: vyzovy i otvety poslednego vremeni [Academic Community and Academic Contracts: Recent Challenges and Solutions]. *Kontrakty v akademicheskoy mire* [Contracting in the Academic World] (ed. M. Yudkevich), Moscow: HSE, pp. 13–31.
- Minaeva O., Bagautdinova S. (2015) Analiz sostoyaniya motivatsii deyatelnosti pedagogov DOU v usloviyakh vvedeniya effektivnogo kontrakta [Analyzing Motivation of Preschool Teachers in the Context of Introducing Performance-Based Contracting]. *Mezhdunarodnyy nauchnyy vestnik*, no 5, part 3, pp. 403–405.

The Educational Potential of Russian Employers: The Gender Aspect

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Abstract. The educational potential of prospective and current employers and gender-based differences in its accumulation and use are analyzed from the perspective of the generation of decent jobs based on the data obtained by the Russian Federal State Statistics Ser-

vice (Rosstat) as part of the "Population Survey on Employment Problems" and "Comprehensive Monitoring of Living Conditions" projects. The study reveals that Russian entrepreneurship is characterized by an expressed gender asymmetry. Professionally employed women have higher educational potential than men, yet less opportunity to play out this competitive advantage as entrepreneurs. The educational potential of Russian employers has been found to be pretty high, but their stratum is too thin yet to be a consistent generator of decent jobs and too difficult to expand.

Keywords: educational potential, employment status, employers, decent jobs, gender asymmetry, stereotypes.

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The level of education of the economically active Russian population, and the female half in particular, is quite high by international standards, and for the moment it remains one of the competitive advantages of the national economy. At the same time, there is the acute problem of a shortage in high-performance jobs that provide decent wages and opportunities for the implementation of the educational and qualification potential of the country's population. Today, in the formation of such jobs, a great deal of hope is placed on the development of innovative business, including small and medium-sized enterprises, capable of responding flexibly to changes in the structure of society's needs and economic conditions. The question is: how justified these expectations are and, in particular, whether the educational potential of the employers themselves is sufficient for conducting an innovative business demanding highly skilled workers, and if there is a gender

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asymmetry in implementing the educational potential of the economically active population in the sphere of non-wage labor. This article is devoted to the search for an answer to this question.

There is a huge amount of research devoted to the ways in which education enhances competitiveness in the labor market, promotes successful careers, increases income from working activities, and expands opportunities for self-fulfillment. A number of works discuss gender differences in strategies for obtaining education and its efficiency [Baskakova 2005; Shauman 2006; Charles, Bradley 2009; Barone 2011; Vuorinen-Lampila 2016; Zamyatnina 2017].

A lot of domestic and foreign research is devoted to the problem regarding business education. However, they focus primarily on assessing the quality of MBA programs, their compliance with the requirements of employers and, consequently, the competitiveness of graduates in the segment of the labor market for hired managers [Azevedo et al. 2008]. Studies of business education in the context of ensuring the sustainability of small businesses and improving the quality of self-employment had previously only been undertaken for developing countries. In particular, based on a survey conducted in Nigeria, the views of entrepreneurs and employees on the possible benefits of business education to working owners of small enterprises were analyzed, but did not address the issue of the extent to which the skills of competent business dealing, including those acquired in the system of business education, had spread among men and women who form this stratum of the population [Akanisi 2012]. Certain works, which address the gender aspects of obtaining a business education, are made based on the domestic data. Subsequently, in a series of articles, T. I. Zaslavskaya [2006] analyzes the differences in educational, social and professional and business resources for men and women studying MBA programs, and the gender specificity of motives for obtaining a business education.

At the same time, in the context of employment status, business education is rarely studied. One project, which covered 11 developing countries in various regions of the world, [UNESCO 2013] recorded a lower educational level in the self-employed compared to employees. Besides, the authors of the research consider the self-employed as a single category, without any distinction between employers and own-account workers. Meanwhile, from the point of view of the International Labor Organization, this distinction is of fundamental importance. The methodology developed by the ILO experts recommends that employees and employers should be united in a segment of sustainable employment that is distinguished from a segment of vulnerable employment that combines own-account workers and unpaid family workers [International Labor Office 2016: 61]. However, it is the segment of small businesses and micro-businesses that does not employ hired labor, which is the source of replenishment of the employers' pool.

In both national and foreign literature there are a number of studies on gender differences in the preferences for hired employment or

self-employment, in terms of business practices and success. According to the OECD, although in the countries of this organization, over the past 10 years, there has been a reduction in the gender gap in the status of employment, it still remains significant. Self-employment is preferred by 18% of all employed men and only by 10% of women. At the same time, men running their own business are 2.5 times more likely to have hired workers, and they work more than women, on average eight hours more per week. The income from doing business among men is also higher, and the gender gap varies from 13% in Sweden to 60% in Poland [OECD 2016: 122, 127].

In studies of gender aspects related to doing business, the focus is on the characteristics of the male and female approaches to the management of an enterprise [Chirikova 1998; Eagly, Karau 2002; Chirikova, Krichevskaya 2000; Brady et al. 2011; Haack 2014], while the issues of the level and quality of the education of employers are seldom addressed. Among the few works in which education is considered in the context of employment status is the recent study by R. Levine and J. Rubinstein [Levine, Rubinstein 2017]. Based on the data from a national labor force survey, they compare the socio-demographic profiles of working owners of enterprises who have the status of a legal entity in the United States as well as those who do not. Unfortunately, the methodology chosen by the authors does not make it possible to clearly identify whether the business owners in the sample have employees or not. In addition, the authors do not specifically investigate the gender aspect, but focus on factors such as education, family characteristics and law-abiding.

In Russia, the educational profile of men and women, depending on their employment status in the segment of non-wage labor, was analyzed on the basis of data from the National Survey of Household Welfare and Participation in Social Programs (NOBUS) conducted by Rosstat in 2003. [Mezentseva et al. 2009]. In a more recent article, I. V. Soboleva [2017] assesses the cash opportunities for full-fledged use and replenishment of the educational potential for skilled workers employed in small businesses, depending on the status of their employment. However, this study is limited to the data for one region and does not affect the gender features of this segment of education.

This article attempts to assess the extent to which the educational potential of real and potential employers, as well as the ways in which this potential is used by men and women, responds to the demands that form the task of economic modernization and ensuring decent employment for the population in this segment of the national labor force.

Research design The object of the study is three groups of non-wage workers: employers (this group includes owners / co-owners of their own enterprises and members of production cooperatives / artels that use wage labor), own-account workers (including owners / co-owners of their enter-

prises and members of production cooperatives / artels, not applying wage labor, as well as individual entrepreneurs who work with organizations on the basis of a civil law contract and unpaid family workers). As a comparison group in the research we used wage earners (employed for wages or remuneration in cash or in kind, or for monetary allowance), with students excluded.

The informational base of the study was data obtained from the Comprehensive Monitoring of Living Conditions (KNUZhN). Rosstat conducted three rounds of this survey (in 2011, 2014 and 2016), but at the time of the study only the results of the first two rounds were available. Meanwhile, the size of the sample in 2011 (10,000 people) is insufficient for a detailed analysis of the characteristics of the subgroups of the working population with different employment status. Therefore, we relied on data from the second round of the survey (2014) with sample size of 60,000 people. Data from the Survey of Population Employment Problems (ONPZ), regularly conducted by Rosstat, were also used.

The choice of KNUZhN as the main information source was determined by the fact that, in comparison with the Survey of Population Employment Problems, it encompasses a wider range of issues that allow assessing various aspects of the quality of working life in modern Russia, including the characteristics of vocational education and the employment conditions of the working population. KNUZhN is the most large-scale survey ever conducted in Russia, containing data on the entire period of educational attainment. Moreover it covers a wide range of factors regarding labor activity reflected in the Decent Work Concept developed under the auspices of the International Labor Organization and allows for assessing the human capital mismatch (discrepancy between the educational profile and the work performed), and the extent to which employees use their professional skills in their chosen occupation.

For the purposes of this study, of the total number of respondents, only employed people who responded to the question of their employment status (54,975 people) were selected. Respondents of both sexes are represented quite evenly: 48% men and 52% women. Among the selected respondents, 96.4% (52,983 people) were employees, 1.5% (798 people) were working employers, 1.6% (883 people) were own-account workers, and 0.6% (311 people) were unpaid family workers. Thus, with a low proportion of self-employed, the scope of the survey still allows for an analysis in terms of people's employment status.

Comparison of the data on the structure of the educational profile of the working population, obtained on the basis of the second round of KNUZhN and ONPZ, shows that the first source gives a somewhat larger shift towards higher education levels (Table 1). To a large extent, this is explained by the fact that in the sample of the ONPZ there is a significantly higher proportion of own-account workers (Table 2),

Table 1. The structure of the employed Russian population according to the level of education in 2014 (%)

Source of the data	Higher education	Secondary vocational education	Primary vocational education	Without professional education
ONPZ	32.2	25.8	19.0	22.9
KNUZhN	38.7	27.2	20.0	14.1

Table 2. The structure of the employed Russian population according to the status of employment in 2014 (%)

Source of the data	Hired workers	Employers	Own-account workers	Unpaid family workers
ONPZ	92.8	1.3	5.5	0.4
KNUZhN	96.4	1.5	1.6	0.6

whose level of education, as shown below, lags behind the indicators for the population as a whole.

Russia within international comparisons

Regarding international comparisons, the Russian structure of its employed population in terms of employment status looks quite decent. As can be seen in Table. 3, in various regions of the world the structure of the employed population is strikingly different. ILO specialists note that a significant proportion of wage earners in the economically active population tends to show a high level of economic development by global standards [International Labor Office 2016: 61]. According to this parameter, Russia meets the highest standards. The proportion of self-employed is usually very high in developing countries and indicates agrarian overpopulation and a shortage of jobs in the formal sector of the economy.

A special feature of the most developed countries is a relatively high (about 4%) share of independent employers among the working population (working enterprise-owners with hired workers). It is the demand from this pool of employers that provides a significant share of decent jobs in the economies of the most developed countries. In the countries of Eastern Europe, which compose the «second echelon» of the European economy, this indicator is half that of most developed countries, while in Russia it is even lower and is only about 1.5%. Thus, the layer of independent employers in our country is still too thin quantitatively to serve as a stable generator of decent employment.

As in most countries, the Russian entrepreneurial stratum is characterized by gender asymmetry in many respects. First of all, the gen-

Table 3. The structure of employed population by employment status in various regions of the world (%)

Region	Employees	Employers	Own-account workers	Unpaid family workers
The whole world	54.8	2.4	33.6	9.2
Low-income countries	19.1	2.0	52.7	26.2
Lower middle- income countries	34.4	1.9	49.8	13.8
Upper middle- income countries	66.8	2.4	25.8	5.0
High-income countries	86.1	3.9	9.1	0.9
USA	90.4	3.4	6.1	0.1
Western Europe	88.0	4.5	7.0	0.5
Eastern Europe	86.7	2.0	10.0	1.3
Russia	92.2	1.4	6.1	0.4

Compiled from: Key Indicators of the Labour Market (KILM) 2015. <http://www.ilo.org/global/statistics-and-databases/research-and-databases/kilm/lang--en/index.htm>

Table 4. Working men and women by employment status in 2014 r. (%)

	Hired workers		Employers		Own-account workers		Unpaid family workers	
	ONPZ	KNUZhN	ONPZ	KNUZhN	ONPZ	KNUZhN	ONPZ	KNUZhN
Men	91.9	95.1	1.8	2.1	5.9	2.1	0.4	0.7
Women	93.7	97.5	0.9	0.9	5.0	1.2	0.4	0.5

der bias of the community of entrepreneurs towards men should be noted. Data from both the ONPZ and the KNUZhN confirm that Russian women are relatively less frequently self-employed, and that they prefer more stable employment with less wage insecurity (Table 4). According to the data of the ONPZ, during the last 10 years the share of self-employed was about 6.0–6.9% among women and about 7.7–8.2% among men. Accordingly, the share of women among the self-employed is lower than among employees (in 2015, respectively, 42.3% and 49.1%).

The status of women in business is worse than for men. As can be seen in Table 4, they are at least twice less likely than men to «break away and become employers». Accordingly, the proportion of women among employers is low and, according to the data of the ONPZ, has tended to decrease (in 2007 it was 39.0%, in 2015—only 32.7%). But in the most vulnerable category of self-employed, that is among unpaid family workers—this share has increased during the indicated period from 46.2% to 49.4%.

Since Russian legislation that regulates business is formally gender neutral (it does not limit female opportunities in this area, nor does it create preferences for female business), one can suppose with a huge level of certainty that the main obstacle to the successful development of female business remains the stability of traditional perceptions about «female» and «male» roles in the society, including social stereotypes, according to which the female nature is less prone to entrepreneurial activity [Baskakova 2013: 40–45].

**Gender
asymmetry in
education**

The main parameter according to which, based on statistical data, it is possible to judge the quality of the layer of entrepreneurs, is their educational potential, i. e. accumulated knowledge, skills and competences, initially acquired in the system of formal professional education and modified (increasing or forfeited) on the path of career progress.

Russia is among the countries with a high level of educational attainment and, above all, with a very high proportion of people with tertiary education (at least college or undergraduate level). Meanwhile, women have a higher educational potential than men. According to the Global Gender Gap Report of 2016, 63% of professional and technical workers are women, which is the highest rate among the 144 surveyed countries [World Economic Forum 2016: 302].

Feminization of the highest levels of professional education, even in the Soviet times, has become one of the features of the country's social development. It led to a significant gap in educational attainment in favour of women among the employed population [Steiner, Bagrov, Bonn 1976: 57–58]. The proportion of women among university students has been fluctuating within the range of 51–58% for many years, while among those with vocational education almost two thirds were young men [Baskakova 2005: 276–278]. Judging by the data from the ONPZ, employed women are consistently characterized by higher educational attainment than men. In 2015, among professionally employed Russians, 37.2% had a university diploma (28.9% among only men), 29.9% had tertiary type B education (among men—only 21.9%). At the same time, 23.6% of men and only 14.5% of women had a vocational education. The proportion of men whose education does not exceed general secondary school is also significantly higher as compared to women (25.5% and 18.3% respectively).

For the purposes of this study, two issues are crucial. Firstly, whether it is possible to consider the business community, and primarily employers, as one of the most educated segments of the working population of the country. Secondly, whether the competitive educational advantage of women as a whole still stands for women in the business community remains a question.

The data from the ONPZ, which makes any comparison of the educational potential of employees and self-employed possible, show that the self-employed have been inferior in terms of their education-

Table 5. **Educational attainment by employment status** (% , N = 54,975)

Level of education	Employees	Employers	Own-account workers	Unpaid family workers
University	33.4	47.9	26.7	33.8
Bachelor / incomplete university	5.1	8.3	5.5	6.4
Tertiary type B	27.3	22.8	28.0	19.9
Vocational	20.2	10.8	21.0	15.1
Without professional education	14.0	10.3	18.8	24.8
Average number of years spent on education	13.35	14.00	13.05	13.15

Calculated using data from KNUZhN.

al potential for many years. According to the data for 2015, among the self-employed the share of people with higher education was 22.5%, while among employees it was 33.8%, and the share of those with secondary vocational education was 21.9% and 26.1% respectively. One can, however, assume that within the community of the self-employed, the level of education is differentiated depending on their status. The ONPZ does not provide an opportunity to verify this assumption, but the data of the KNUZhN fully confirm it.

As can be seen from Table. 5, own-account workers significantly lag behind in terms of education when compared with employees. Employers, on the contrary, are, by a similar distance, substantially ahead of them. Among employers, 56.2% have a university or incomplete university education and only one in ten does not have any professional education at all, while among employees the share of those having university education is almost one and a half times lower, and the proportion of those with no professional education 1.5 times higher. According to the average number of years spent on education, employers also outstrip employees, while other categories of self-employed people lag behind them.

Thus, on the one hand, the layer of employers in Russia, although being slender compared with this segment of the population in developed countries, nevertheless has a good educational potential. On the other hand, reinforcements of this stratum due to the strengthening of the economic position of entrepreneurs who do not use hired labor in the current situation is likely to result in a decrease of this potential.

What contribution do women make to the formation of the business community's educational potential and is their competitive advantage based on a higher educational attainment preserved here? The data from the ONPZ answer this question in a negative way: among the self-employed, the educational attainment of women is somewhat lower than that of men (Figure 1). Among self-employed

Fig. 1. Level of education of men and women, who work as employed or non-recruited

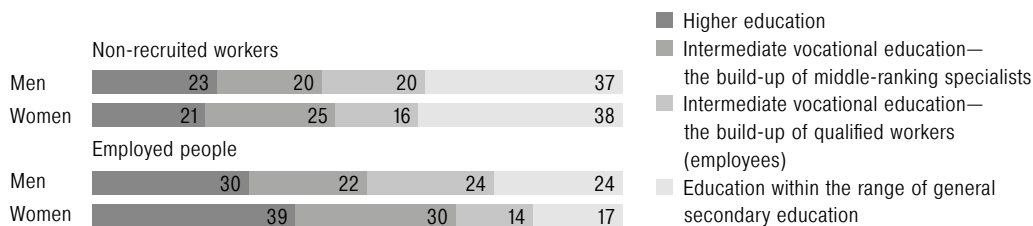


Table 6. Level of education of men and women with different employment status
(%, N = 54975)

Level of education	Hired workers		Employees		Own-account workers		Unpaid family workers	
	Men	Women	Men	Women	Men	Women	Men	Women
University	28.4	37.9	48.4	46.7	26.7	26.7	29.7	39.5
Bachelor / incomplete university	4.8	5.4	8.5	7.7	6.3	4.3	9.3	2.3
Tertiary type B	23.2	30.9	20.7	27.6	24.0	34.7	16.5	24.8
Vocational	27.3	13.8	11.4	9.3	22.6	18.2	18.7	10.1
Without professional education	16.3	12.0	11.1	8.5	20.4	16.1	25.8	23.3
Average number of years spent on education	13.03	13.65	14.02	13.97	13.03	13.09	13.01	13.36

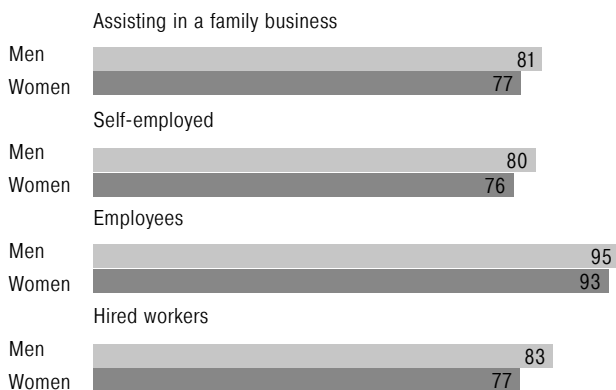
Calculated based on data from KNUZhN.

women, in 2015, 21.2% had a university education, while among women employees it was 38.3%; among men these figures were 23.4 and 29.4%, respectively. In addition, 24.6% of female entrepreneurs (and 30.3% of women employees) had a Tertiary type B education as did 19.9% of male entrepreneurs (and 22.1% of employed men). Among those with a vocational education, the corresponding shares were 15.7% (14.4%) and 19.2% (24%). The share of men and women without a professional education among the self-employed is approximately equal (37.5% and 38.7%), and significantly exceeds the same figures among employees.

The KNUZhN data make it possible to characterize in a more detailed way the gender asymmetry in education among those who are self-employed (Table 6).

Female employers, although they have higher educational attainment as compared to employees, unlike the latter, in their educational potential lag behind their male colleagues. We believe that one of the reasons for this gap is the horizontal (sectoral and professional) segregation of the Russian sphere of professional education and employment. Most of the professions and specialties of education in Russian

Fig. 2. The share of those who have skills in working with a personal computer, %



universities, as well as economic activities have been given the status of «male» or «female» in public opinion. At the same time, social and humanitarian specialties and economic activities (culture, health, education), which for various reasons have become deeply feminized, function more in the budget segment of the economy. «Male» professions and economic activities, represented mainly by engineering professions, on the contrary, demonstrate more demand in the market segment [Zamyatnina 2017]. Another likely reason for the backwardness of female employers in terms of education from male colleagues is the relatively high competitiveness of highly educated women in the wage labor market, which allows them to successfully build their professional careers, avoiding the risks associated with entrepreneurship. The evidence of a high proportion of women (40%) among those occupying top management positions supports this view. According to this indicator, today, the Russian Federation is the world leader [Grant Thornton International 2015].

Gender asymmetry of the level of education in the category of own-account workers is manifested only by the shares of men and women who have tertiary type B (in favor of women) and vocational (in favor of men) education. The low level of education of the self-employed reveals that the Russian version of self-employment is rather a survival strategy. Opportunities for business development in this segment are limited, and the potential for creating new jobs, especially innovative ones, is low.

In the segment of non-wage workers, a clear gender asymmetry in favor of women remains in the «unpaid family workers» category only. However, as shown below, in this case it is not a continuing competitive advantage, but rather an underutilization of the accumulated educational potential.

In the digital economy, the most important additional indicator of the quality of the educational potential is computer literacy. Judging by the results of the KNUZhN, for the working population as a whole its level is quite high. At the time of the survey, 80.6% of the economically active population possessed computer skills. As can be seen in Fig. 2, a share of those who have skills in working on a personal computer is the largest one among employers (94.0%), and the smallest among own-account workers (77.8%). Regardless of the status of employment in all categories, the proportion of women able to work on a computer exceeds that of men.

In general, for men, there is a more pronounced shift in the aggregate educational potential in favor of employers compared to women.

Gender asymmetry in the use of educational potential

The mismatch of educational and employment profiles, which impedes the effective implementation of the educational potential, is today one of the most acute and painful problems of the Russian economy. Judging by the data of the KNUZhN, in the sphere of non-wage labor it is much more crucial than among employees: four employees out of ten are employed according to their profession, while among the self-employed this share is more than half (Table 7). This is quite understandable: in the wage labor market, employers tend to consider the level and profile of an applicant's education, and the entrepreneur is freer in choosing the direction of his activity.

The mismatch is most acute for unpaid family workers: almost two-thirds of them work not according to the profile of the education obtained. Such a result is expected, since the very status of their employment implies that the workplace was chosen not by considering the maximum use of accumulated knowledge, skills and competencies, but based on the needs of the family. However, the flagship of the business community, that is highly educated employers, also lag behind employees in terms of the indicator of the match between education and work performed. Among them, only one in five works by profession (21.2%). At the same time, employers are significantly ahead of other categories of the economically active population, including wage earners, according to the share of employees in the related profession (23.9%). It can be assumed that, from other categories of the workforce, employers are more capable of adapting the acquired knowledge and skills to the changing demands of the workplace. As for own-account workers, although they are characterized by a relatively low level of education, the coincidence of work and acquired specialty coincide somewhat more often than employers.

An analysis of gender differences in the implementation of educational potential reveals conflicting trends (Table 8). On the one hand, women, as a rule, tend to experience less mismatch. And this tendency is most clearly manifested in women-employers: among them, the proportion of good matches with the profile of the education re-

Table 7. Match of educational and employment profiles by employment status
(%, N = 54975)

Degree of correspondence	Employees	Employers	Own-account workers	Unpaid family workers
Totally coincides	43.6	21.2	28.2	19.0
Work close to the profession	15.4	23.9	15.4	17.4
Work not related to the profession	41.1	54.9	56.4	63.7

Calculated based on data from KNUZhN.

Table 8. Match of educational and employment profiles by employment status and gender (%, N = 54975)

Degree of correspondence of work and obtained profession	Employers		Employees		Own-account workers		Unpaid family workers	
	Men	Women	Men	Women	Men	Women	Men	Women
Yes, this work fully corresponds to the obtained profession	41.4	45.6	17.4	29.7	27.8	28.9	19.2	18.6
Yes, this work is close to the obtained profession	17.0	13.9	26.1	19.1	15.3	15.5	14.8	20.9
No, this work is not related to the profession obtained	41.7	40.5	56.5	51.2	56.9	55.6	65.9	60.5

Calculated based on data from KNUZhN.

ceived is almost twice the corresponding figure for male employers. Among the latter, only 17.4% work according to the profession obtained, which is the lowest among all categories of employees. Besides, they also have the highest proportion of those who work in a profession close to theirs; among women this share is somewhat lower. Nevertheless, this result indicates that the maintenance of a relatively high level of use of the accumulated educational potential in the employer community is achieved largely at the expense of women.

On the other hand, women who have the status of unpaid family workers, although they initially have one of the highest levels of education among the groups in question, use it even less than men with the same status, although the educational potential of the latter is much lower. In other words, a considerable part of the professional knowledge and skills of the business community is sacrificed to the interests of the family business.

Along with the objective characteristics of the accumulated educational potential and the degree of its actual use, the data from KNUZhN allow us to obtain a subjective assessment of its sufficiency for performing more complicated work for different categories of em-

Table 9. Reflection of men and women on their skills or qualifications for performing more complicated work
(%, N = 54975)

	Employees	Employers	Own-account workers	Unpaid family workers
Men	59.3	61.4	61.2	60.4
Women	57.6	58.1	56.5	58.9

Calculated based on data from KNUZhN.

employees. This assessment is very important, although it can be interpreted in two ways. On the one hand, readiness for more complicated work, in essence, means the presence of extra skills, an «awning» of knowledge and skills that are unnecessary in the circumstances, the non-use of which is fraught with the risk of their loss. On the other hand, an additional stock of qualifications can be considered as a reserve, necessary for entrepreneurs to develop and improve the quality of business.

According to subjective assessments of employees, the «awning» (or reserve) available is very significant. At the same time, the share of those who are confident in their abilities to perform work more complicated than that which they are currently doing is practically independent of the status of employment (it ranges from 58.4% for employees to 60.4% for employers). Gender differences in this indicator are also low, but women in all groups have a lower self-esteem than men (Table 9).

In all of the categories considered, the share of women who believe that their skills and qualifications are sufficient to carry out more complicated work are less than the proportion of men who have the same opinion about their abilities. It is also true for employees—a group where women have a clear advantage in education, and for employers, where there is no such strength. It can be assumed that a relatively low self-esteem is one of the main obstacles both for the construction of women's professional careers in hired labor, and for the progress of women's businesses. It is noteworthy that women assess their skills and qualifications lower than men, yet have higher rates of computer literacy, which is a qualification, undoubtedly fundamental in the development of innovative business and digital economy.

Conclusion The analysis of data obtained from the Population Survey on Employment Problems and the Comprehensive Monitoring of Living Conditions projects showed that the educational potential of Russian individual entrepreneurs who use hired labor is high enough, but their layer is still too slender to serve as a sustainable generator of decent

employment. At the same time, the existing opportunities for increasing this layer are not vast. Firstly, the share of the self-employed which is the source of replenishment of the employers' pool in the Russian economy is low. Secondly, although employers outstrip employees on the basic parameters of education, other categories of self-employed lag behind them. Low educational attainment, insufficient computer literacy and high skill mismatch within the self-employed make their opportunities to develop into employers and create new jobs rather problematic. In the overwhelming majority of cases, self-employment in Russia is a classic form of precarious employment, and not a milieu for innovative entrepreneurship. Under such circumstances, the replenishment of the employer's stratum by strengthening the economic position of entrepreneurs who do not use wage labor is likely to result in a decline in its educational potential.

Russian entrepreneurship is characterized by a pronounced gender asymmetry in many respects. There are fewer women in the business community than men. Female business, as a rule, is less successful. Women entrepreneurs lag behind men in terms of their educational attainment, although women employees have a significantly higher educational potential than men, and in general, the educational attainment of women is higher than that of men. At the same time, successful women entrepreneurs apply their educational potential better. Among female working employers, the match between the profile of the education and job demands is almost twice as good as among males. Thus, the relatively high level of utilization of the accumulated educational potential in the employer community is largely due to women.

The main obstacles to the successful development of female businesses are the persistence of traditional beliefs that women are inherently less suited to doing business, and women's lower assessment of their own professional capabilities. Women often perceive themselves as second jobholders and second persons in family enterprises. Hence the colossal «canopy» of education for women—unpaid family workers. Simultaneously, the relatively high competitiveness of well-educated women in the wage labor market allows them to successfully build a professional career, avoiding the risks associated with entrepreneurship.

The future of innovative business will largely depend upon whether educated young people will opt for joining the ranks of entrepreneurs. Data from the Selective Observation of Graduate Employment held by Rosstat in 2016 ¹ show that their inflow into entrepreneurship is very modest. Among the working graduates surveyed, the share of self-employed is less than in the economically active population as a whole (2.3%). The employment preferences of young men and

¹ http://www.gks.ru/free_doc/new_site/population/trud/itog_trudoustr/index.html

women identified by the survey also do not trend towards diminishing gender asymmetry. Young women are almost twice less likely to opt for self-employment. Among youths, 3% were self-employed, while among girls only 1.6%.

In Russia, the risks of doing business are higher than in Europe, social safety nets in the sphere of non-wage labor are weak and there are practically no programs aimed at supporting female business that could help overcome psychological and other barriers to its development. Under these conditions, young people who have received a good professional education prefer a career as an employee. It means that new forces that could reorient the business community from survival business towards innovative entrepreneurship are rather scarce.

References

- Akanisi Ch.B. (2012) *Perception of Employers and Employees on Business Education Graduates in Setting and Managing Small Scale Businesses in Kaduna State, Nigeria*. Zaria: Ahmadu Bello University.
- Azevedo A., Gomezelj D., Andrews J., Higson H., Caballero A. (2008) *The Impact of Learning Outcomes in Business Education: Assessing Value, Relevance and Graduate Ability in a Multicountry Study of Employers and Business Graduates*. Paper presented at OECD Annual Conference «International Studies in Management in Higher Education», Paris, 8–10 September, 2008.
- Barone C. (2011) Some Things Never Change. Gender Segregation in Higher Education across Eight Nations and Three Decades. *Sociology of Education*, vol. 84, no 2, pp. 157–176.
- Baskakova M. (ed.) (2013) *Diskriminatsiya v sfere truda po gendernomu priznaku* [Gender Discrimination in Employment], Moscow: Pervaya obraztsovaya tipografiya.
- Baskakova M. (2005) Muzhchiny i zhenshchiny v sisteme obrazovaniya [Men and Women in the Education System]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 1, pp. 276–303.
- Brady D., Isaacs K., Reeves M., Burroway R., Reynolds M. (2011) Sector, Size, Stability, and Scandal: Explaining the Presence of Female Executives in Fortune 500 Firms. *Gender in Management: An International Journal*, vol. 26, no 1, pp. 84–105.
- Charles M., Bradley C. (2009) Indulging our Gendered Selves? Sex Segregation by Field of Study in 44 Countries. *American Sociological Review*, vol. 114, no 4, pp. 924–976.
- Chirikova A. (1998) *Zhenshchina vo glave firmy* [Woman in Charge of a Company], Moscow: Institute of Sociology, Russian Academy of Sciences.
- Chirikova A., Krichevskaya O. (2000) Zhenshchina-rukovoditel: delovye strategii i obraz "Ya" [Female Leader: Business Strategies and Self-Image]. *Sotsiologicheskie issledovaniya*, no 11, pp. 45–56.
- Eagly A. H., Karau, S. J. (2002) Role Congruity Theory of Prejudice toward Female Leaders. *Psychological Review*, vol. 109, no 3, pp. 573–598.
- Grant Thornton International (2015) *Women in Business: The Path to Leadership*. Available at: http://www.fbk.ru/upload/images/ibr2015_wib_report_final.pdf (accessed 10 November 2017).
- Haack K. (2014) Breaking Barriers? Women's Representation and Leadership at the United Nations. *Global Governance*, vol. 20, no 1, pp. 37–54.
- World Economic Forum (2016) *The Global Gender Gap Report 2016*. Available at: http://www3.weforum.org/docs/GGGR16/WEF_Global_Gender_Gap_Report_2016.pdf (accessed 10 November 2017).

- International Labour Office (2016) *Key Indicators of the Labour Market*. Geneva: International Labour Office.
- Levine R., Rubinstein Y. (2017) Smart and Illicit: Who Becomes an Entrepreneur and Do They Earn More? *Quarterly Journal of Economics*, vol. 132, no 2, pp. 963–1018.
- Mezentseva E., Khotkina Z., Malysheva M., Baskakova M., Khadzhalova K., Nazarova I. (2009) Gendernye protivorechiya na rynke truda [Gender Contradictions in the Labor Market]. *Gendernye stereotipy v menyayushchemsya obshchestve: opyt kompleksnogo sotsialnogo issledovaniya* [Gender Stereotypes in Changing Society: Integrated Social Research Experience] (ed. N. Rimashevskaya), Moscow: Nauka, pp. 83–186.
- Mishel-Alder E. (1991) *Stil zhenskogo rukovodstva. Lektsiya* [Female Leadership Style. Lecture], Moscow: Higher Trade School, Ministry of Foreign Economic Relations.
- OECD (2016) *Entrepreneurship at a Glance*. Paris: OECD. Available at: http://dx.doi.org/10.1787/entrepreneur_aag-2016-en (accessed 10 November 2017).
- Shauman K. A. (2006) Occupational Sex Segregation and the Earnings of Occupations: What Causes the Link among College-Educated Workers? *Social Science Research*, vol. 35, no 3, pp. 577–619.
- Shteyner A., Bagrov A., Bonn E. (1976) *Ispolzovanie zhenskogo truda v narodnom hozyaystve* [Using Female Labor in National Economy], Moscow: National Research Institute of Labor.
- Soboleva I. (2017) Vozmozhnosti nakopleniya chelovecheskogo kapitala v sektore malogo biznesa [Opportunities for Human Capital Accumulation in the Small Business Sector]. *Sotsiologicheskie issledovaniya*, no 4, pp. 60–72.
- UNESCO (2013) *Educational Attainment and Employment Outcomes: Evidence from 11 Developing Countries*. Paper commissioned for the Education for All Global Monitoring Report 2013/4. Available at: <http://unesdoc.unesco.org/images/0022/002263/226333e.pdf> (accessed 10 November 2017).
- Vuorinen-Lampila P. (2016) Gender Segregation in the Employment of Higher Education Graduates. *Journal of Education and Work*, vol. 29, no 3, pp. 284–308
- Zamyatnina E. (2017) Gendernye razlichiya pri vybore spetsialnosti v vuze v sovremennoy Rossii [Gender Differences in Major Choice in Modern Russia]. *Monitoring obshchestvennogo mneniya: ekonomicheskie i sotsialnye peremeny*, no 3, pp. 163–176.
- Zaslavskaya T. (2006) Avangard rossiyskogo biznes-sloya: genderny aspekt (statya pervaya) [Avant-Garde of Russian Business Community: Gender Aspects (Article One)]. *Sotsiologicheskie issledovaniya*, no 4, pp. 26–37.
- Zaslavskaya T. (2006) Avangard rossiyskogo delovogo soobshchestva: genderny aspekt (statya vtoraya) [Avant-Garde of Russian Business Community: Gender Aspects (Article Two)]. *Sotsiologicheskie issledovaniya*, no 5, pp. 3–14.

Assessing Information and Communication Technology Competence of Students: Approaches, Tools, Validity and Reliability of Results

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Abstract

The study describes the Information and Communication Literacy Test (the ICL Test), an instrument to measure information and communication technology competence in middle school students (grades 7–9). An overview of the existing instruments proves that there are no other ICT competence assessment instruments applicable to Russian students today. The assessment was constructed using an innovative systematic approach (evidence-centered assessment design, ECD). The ICL Test results were calculated using Bayesian networks, which are more effective than the Item Response Theory in this case. The ICL Test revealed a high level of construct, content, convergent, divergent and face validity as well as good reliability. The instrument conforms to both Russian and international educational standards according to Webb's criteria for alignment. The ICL Test results were used to assess ICT competence and identify the factors that influence its development in regions of Russia, Armenia and Belarus. The conclusion is that the ICL Test can be applied to both Russian and foreign education systems.

Keywords

information and communication technology competence, tests, Information and Communication Literacy Test, validity, competence, competence assessment, cross-disciplinary educational outcomes.

References

Abbot S. (2014) Hidden Curriculum. *The Glossary of Education Reform* (ed. S. Abbott). Available at: <http://edglossary.org/hidden-curriculum> (accessed 5 November 2017).

- American Educational Research Association, American Psychological Association, National Council on Measurement in Education (1999) *The Standards for Educational and Psychological Testing*. Washington, DC: American Psychological Association.
- Aesaert K., van Nijlen D., Vanderlinde R., van Braak J. (2014) Direct Measures of Digital Information Processing and Communication Skills in Primary Education: Using Item Response Theory for the Development and Validation of an ICT Competence Scale. *Computers & Education*, vol. 76, July, pp. 168–181.
- Ainley J., Fraillon J., Freeman C. (2007) *National Assessment Program. Literacy Years 6 & 10 Report, 2005*. Sydney NSW: Australian Curriculum, Assessment and Reporting Authority.
- American Library Association (2000) *Information Literacy Competency Standards for Higher Education*. Chicago, IL: The Association of College and Research Libraries.
- Australian Library and Information Association, Information Literacy Forum (2001) *Statement on Information Literacy for all Australians*. Kingston: Australian Library and Information Association. Available at: <http://www.alia.org.au/groups/infolit/information.literacy.html> (accessed 5 November 2017).
- Avdeeva S., Baryshnikova M., Kovalenko S., Melnikov A. (2009) Ob opyte realizatsii modeli otsenki IKT-kompetentnosti [On the Experience of ICT-Competence Evaluation Model Realization]. *Informatizatsiya obrazovaniya i nauki*, no 2, pp. 62–71.
- Avdeeva S., Khudenko L. (2014) Issledovanie informatsionno-kommunikatsionnoy kompetentnosti uchashchikhsya 9-kh klassov Respubliki Belarus': tsel' i osnovnye rezul'taty [Research on the Information and Communication Technology Competence of Ninth-Graders in the Republic of Belarus: The Goal and the Main Findings]. *Vestnik obrazovaniya*, no 1, pp. 3–10.
- Avdeeva S., Zelman M. (2011) *Competence Assessment Instrument and Its Use*. Paper presented at the 36th Annual Conference of the International Association for Educational Assessment (IAEA) "Assessment for the Future Generations". Bangkok (Thailand), 2010, 20–27 August.
- Blömeke S. (2000) *Medienpädagogische Kompetenz: theoretische und empirische Fundierung eines zentralen Elements der Lehrerbildung*. München: KoPäd-Verlag.
- Brown J. (1998) Media Literacy Perspectives. *Journal of Communication*, no 48, iss. 1, pp. 44–57.
- Cameron L., Wise S. L., Lottridge S. M. (2007) The Development and Validation of the Information Literacy Test. *College & Research Libraries*, vol. 68, no 3, pp. 229–237.
- Campbell D. T., Fiske D. W. (1959) Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix. *Psychological Bulletin*, vol. 56, no 2, pp. 81–105.
- Celot P., Tornero J. M. P. (eds) (2009) *Study on Assessment Criteria for Media Literacy Levels. A Comprehensive View of the Concept of Media Literacy and Understanding of How Media Literacy Levels in Europe Should Be Assessed*. Brussels: European Association for Viewers' Interests.
- Cronbach L. J. (1971) Test Validation. *Educational Measurement* (ed. R. L. Thorndike), Washington, DC: American Council on Education, pp. 443–507.
- Educational Testing Service (2002a) *Digital Transformation for Literacy: A Report of the International ICT Literacy Panel*. Available at: http://www.ets.org/Media/Tests/Information_and_Communication_Technology_Literacy/ictreport.pdf (accessed 5 November 2017).
- Educational Testing Service (2002b) *ETS Standards for Equality and Fairness*. Princeton, NJ: ETS.

- Flesch R. (1974) *The Art of Readable Writing*. New York: Harper & Row.
- Flesch R. (1981) *Why Johnny Still Can't Read: A New Look at the Scandal of Our Schools*. New York: Harper & Row.
- Fraillon J., Ainley J. (2010) *The IEA International Study of Computer and Information Literacy (ICILS)*. Available at: <http://icils.acer.edu.au> (accessed 5 November 2017).
- Fraillon J., Schulz W., Ainley J. (2013) *International Computer and Information Literacy Study: Assessment Framework*. Amsterdam: IEA.
- Hambleton R. K., Swaminathan H., Jane Rogers H. (1991) *Fundamentals of Item Response Theory*. Newbury Park, CA: SAGE.
- Hepworth M. (2000) The Challenge of Incorporating Information Literacy into the Undergraduate Curriculum. Seven Pillars of Wisdom? Good Practice in Information Skills Development (eds S. Corral, H. Hathaway), London: SCOUNL, pp. 11–21.
- Huggins A. C., Ritzhaupt A. D., Dawson K. (2014) Measuring Information and Communication Technology Literacy Using a Performance Assessment: Validation of the Student Tool for Technology Literacy (ST 2 L). *Computers & Education*, vol. 77, August, pp. 1–12.
- Jenkins H. (2009) *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*. Cambridge, MA; London: MIT Press.
- Jensen A. R. (1998) *The g Factor: The Science of Mental Ability*. Westport, CT: Praeger.
- Johnston B., Webber S. (2003) Information Literacy in Higher Education: A Review and Case Study. *Studies in Higher Education*, vol. 28, iss. 3, pp. 335–352.
- Katz I. R. (2013) Testing Information Literacy in Digital Environments: ETS's iSkills Assessment. *Information Technology and Libraries*, vol. 26, no 3, pp. 3–12.
- Katz I. R., Macklin A. S. (2007) Information and Communication Technology (ICT) Literacy: Integration and Assessment in Higher Education. *Systemics, Cybernetics and Informatics*, vol. 5, no 4, pp. 50–55. Available at: <http://www.iisci.org/Journal/CV%2Fsci/pdfs/P890541.pdf> (accessed 5 November 2017).
- Kim H.-S., Kil H.-J., Shin A. (2014) An Analysis of Variables Affecting the ICT Literacy Level of Korean Elementary School Students. *Computers & Education*, vol. 77, August, pp. 29–38.
- Kincaid J. P., Gamble L. G. (1977) Ease of Comprehension of Standard and Readable Insurance Policies as a Function of Reading Ability. *Journal of Reading Behavior*, vol. 9, no 1, pp. 87–95.
- Kondakov A., Kezina L. (eds) (2013) *Primernaya osnovnaya obrazovatel'naya programma obrazovatel'nogo uchrezhdeniya. Osnovnaya shkola* [Approximate Basic Educational Program of Educational Institution. General Secondary Education], Moscow: Institute for Strategy of Education Development of the Russian Academy of Education.
- Lennon M., Kirsch I., von Davier M., Wagner M., Yamamoto K. (2003) *Feasibility Study for the PISA ICT Literacy Assessment*. Available at: <http://www.oecd.org/dataoecd/35/13/33699866.pdf> (accessed 5 November 2017).
- Livingstone S., Thumim N. (2003) *Assessing the Media Literacy of Adults. A Review of Academic Literature Produced for Broadcasting Standards Commission Independent Television Commission NIACE*. Available at: http://www.ofcom.org.uk/static/archive/itc/uploads/Assessing_the_media_literacy_of_UK_adults1.pdf (accessed 5 November 2017).
- Love K. G., Hughes F. V. (1994) Relationship of Self-Assessment Ratings and Written Test Score: Implications for Law Enforcement Promotional Systems. *Public Personnel Management*, vol. 23, no 1, pp. 19–30.
- Malta Qualifications Council (2007) *Descriptors of Key Competences in the National Qualification Framework. Competences of Personal Development*.

- Available at: <http://cpd.yolasite.com/key-competences.php> (accessed 5 November 2017).
- Mislevy R. J., Almond R., Dibello L., Jenkins F., Steinberg, L. (2002) *Modeling Conditional Probabilities in Complex Educational Assessments. CSE Technical Report*. Los Angeles: The National Center for Research on Evaluation, Standards, Student Testing (CRESST), Center for Studies in Education, UCLA. Available at: <http://www.cse.ucla.edu/CRESST/Reports/TR580.pdf> (accessed 5 November 2017).
- Mislevy R. J., Levy R. (2007) Bayesian Psychometric Modeling from an Evidence-Centered Design Perspective. *Handbook of Statistics* (eds C. R. Rao, S. Sinharay), Amsterdam: Elsevier, pp. 839–865.
- Neil A., (2007) *KS3 Online Test—Members' Responses to the Change in Status*. Available at: <http://www.naace.co.uk/212> (accessed 5 November 2017).
- Oborneva I. (2006) *Avtomatizirovannaya otsenka slozhnosti uchebnykh tekstov na osnove statisticheskikh parametrov* [Automated Evaluation of Educational Text Complexity Based on Statistical Parameters] (PhD Thesis). Moscow: Institute of Education Content and Teaching Methods.
- Rader H. B. (2002) Information Literacy 1973–2002: A Selected Literature Review. *Library Trends*, vol. 51, no 2, pp. 242–259.
- The European Parliament, the Council (2006) *Lifelong Learning—Key Competences. Recommendation (2006/962/)*. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:c11090> (accessed 5 November 2017).
- UNESCO Communication and Information Sector, UNESCO Institute for Statistics (2013) *Global Media and Information Literacy Assessment Framework: Country Readiness and Competencies*. Paris: United Nations Educational, Scientific and Cultural Organization.
- Van Joolingen W. (2004) *The Framework for Assessment of ICT Literacy*. Available at: <http://www.ictliteracy.info/rf.pdf/PISA%20framework.ppt> (accessed 5 November 2017).
- Virkus S. (2003) Information Literacy in Europe: A Literature Review. *Information Research*, vol. 8, no 4, paper no 159.
- Wang W. C., Wilson M. (2005) The Rasch Testlet Model. *Applied Psychological Measurement*, vol. 29, no 2, pp. 126–149.
- Webb N. L. (1997) *Criteria for Alignment of Expectations and Assessments in Mathematics and Science Education. Research monograph no 8*. Washington, DC: Council of Chief State School Officers.
- World Economic Forum (2015) *New Vision for Education Unlocking the Potential of Technology*. Geneva: World Economic Forum.
- Zwick R., Thayer D. T., Lewis C. (1999) An Empirical Bayes Approach to Mantel-Haenszel DIF Analysis. *Journal of Educational Measurement*, vol. 36, no 1, pp. 1–28.

The Body in Education: The Cognitive and Phenomenological Perspective

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Abstract The article reflects one of the main tendencies in philosophy of education, the so-called “corporeal turn”. An attempt is made to analyze the key ideas of Maurice Merleau-Ponty’s phenomenology and the latest achievements in cognitive research in their relationship with the phenomenon of education. The ideas of cognition as a process of producing mental representations, body and mind dichotomies and the value priority of the latter over the former are criticized. Justification is provided for the idea that the mind executes its cognitive processes using epistemic resources that emerge and are congruent with activities, needs and goals of the body. Thus, the mind is not restricted to one “place”, rather being distributed across a network of interactions between mental, sensory and motor processes. The appeal to the lived body experience is extremely important as it reveals the meanings that students focus on in their learning activity, thus making intersubjective relationships more transparent. The explication of the idea of unity of body and mind will allow educators to adequately determine the role and place of corporeity in both perception and thought processes and eventually discover new cognitive and phenomenological strategies for substantiating the significance of such disciplines as drama and dance, music and physical education in the educational process.

Keywords mind, body, embodied presence, lived experience, education, phenomenology, cognitive science, drama, music, dance, physical education.

- References**
- Ashimova D., Ibragim B. (2015) Metodika prepodavaniya predmeta “drama” v angliyskikh shkolakh [Methodology of Teaching Drama in British Schools]. *The Unity of Science: International Scientific Periodical Journal*, no 1, pp. 13–16.
- Blumenfeld-Jones D. (2009) Bodily-Kinesthetic Intelligence and Dance Education: Critique, Revision, and Potentials for the Democratic Ideal. *Journal of Aesthetic Education*, vol. 43, no 1, pp. 59–76.
- Bowman W. (2004) Cognition and the Body: Perspectives from Music Education in Elementary Schools. *Knowing Bodies, Moving Minds: Towards Embodied Teaching and Learning* (ed. L. Bresler), Dordrecht, Boston, London: Kluwer Academic Publishers, pp. 29–51.
- Bresler L. (2004) Dancing the Curriculum: Exploring the Body and Movement in Elementary Schools. *Knowing Bodies, Moving Minds: Towards Embodied Teaching and Learning* (ed. L. Bresler), Dordrecht, Boston, London: Kluwer Academic Publishers, pp. 127–153.
- Carroll-Phelan B., Hampson P. J. (1996) Multiple Components of the Perception of Musical Sequences: A cognitive Neuroscience Analysis and Some Implications for Auditory Imagery. *Music Perception: An Interdisciplinary Journal*, vol. 13, no 4, pp. 517–562.
- Clark A. (1997) *Being There: Putting Brain, Body, and World Together Again*. Cambridge, MA; London: MIT Press / Bradford Books.

- Connolly M. (1995) Phenomenology, Physical Education, and Special Populations. *Human Studies*, no 18, pp. 25–40.
- DeNora T. (2000) *Music in Everyday Life*. Cambridge: Cambridge University.
- Foucault M. (1996) *Volya k istine: po tu storonu znaniya, vlasti i seksualnosti. Raboty raznykh let* [The Power to Will: The Other Side of Knowledge, Power and Sexuality. Studies of Various Years]. Moscow: Kastal.
- Hughson J., Inglis D. (2002) Accounting for Experience: Phenomenological Argots and Sportive Life-Worlds. *Indo-Pacific Journal of Phenomenology*, vol. 2, no 2, pp. 1–10.
- Kimball M. M. (1994) Writing Standards for Dance. *The Vision for Arts Education in the 21st Century: The Ideas and Ideals Behind the Development of the National Standards for Education in the Arts*. Reston, VA: Music Educators National Conference, pp. 32–35.
- Lakoff G. (2004) *Zhenshchiny, ogon i opasnye veshchi: chto kategorii yazyka govoryat nam o myshlenii* [Women, Fire, and Dangerous Things. What Categories Reveal about the Mind]. Moscow: Yazyki slavyanskoy kultury.
- Lakoff G., Johnson M. (1999) *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books.
- McWilliam E. (2003) The Vulnerable Child as a Pedagogical Subject of Risk Management. *Journal of Curriculum Theorizing*, vol. 19, no 2, pp. 35–44.
- Merleau-Ponty M. (1999) *Fenomenologiya vospriyatiya* [Phenomenology of Perception]. St. Petersburg: Yuventa; Nauka.
- O'Loughlin M. (2006) *Embodiment and Education: Exploring Creatural Existence*. Dordrecht: Springer Netherlands.
- Roholt T. C. (2014) *Groove: A Phenomenology of Rhythmic Nuance*. New York: Bloomsbury Academic.
- Shusterman R. (2004) Somaesthetics and Education: Exploring the Terrain. *Knowing Bodies, Moving Minds: Towards Embodied Teaching and Learning* (ed. L. Bresler), Dordrecht, Boston, London: Kluwer Academic Publishers, pp. 51–60.
- Shyues K. (1999) Anonimnye sily gabitusa [Anonymous Powers of the Habitus]. *Logos*, no 10, pp. 4–15.
- Smith L., Gasser M. (2005) The Development of Embodied Cognition: Six Lessons from Babies. *Artificial Life*, vol. 11, no 1–2, pp. 13–29.
- Svendler-Nielsen Ch. (2012) Children's Embodied Voices: Approaching Children's Experiences through Multi-Modal Interviewing. *Hermeneutic Phenomenology in Education: Method and Practice* (eds N. Friesen et al.), Rotterdam: Sense, pp. 163–177.
- Thorburn M. (2008) Articulating a Merleau-Pontian Phenomenology of Physical Education: The Quest for Active Student Engagement and Authentic Assessment in High-Stakes Examination Awards. *European Physical Education Review*, vol. 14, no 2, pp. 263–280.
- Varela F., Thompson E., Rosch E. (1991) *The Embodied Mind*. Cambridge, MA: MIT.
- Volkova S. (2012) *Smysl v mire obrazovaniya* [Meaning in Education]. Petrozavodsk: Petrozavodsk State University.

Distinctive Ability of Concept Maps for Assessing Levels of Competence

Pilot study

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Abstract. Previous research has proved the concept mapping is an effective tool to evaluate knowledge structure, but usually the concept mapping served to foster and trace individual progress in specific field of knowledge. No attention was paid to identifying or verifying the formal indicators of concept maps or their sensitiveness to the level of competence in a specific field of knowledge. However it will make possible to use concept mapping as a standardized tool. In the current study some possible indicators are suggested based on concept maps of experts (n=4) and novices (n=9) in the field of data analysis. Experts and

novices constructed their concept maps individually after receiving standardized instructions and brief training. Formal indicators were based on interpreting concept map as a graph. Specifically, indicators such as generality of concepts used, structure coherence, proportions of singular, complex concepts, etc. were expected to be discriminative for different levels of competence. We found that nearly all indicators actually discriminate between experts and novices. In addition, a few qualitative parameters of concept maps were identified (availability of key concepts, existence of erroneous relationships, procedural/conceptual nature of knowledge) which also differed across groups. As a result, concept mapping look potentially helpful for standardized evaluation of competence levels if we use the formal indicators. Although further research on extended and heterogeneous samples is required to test stability and generalizability of this formal approach to the concept mapping.

Keywords: cognitive development, concept mapping, knowledge structure, development of scientific concepts, expert, novice.

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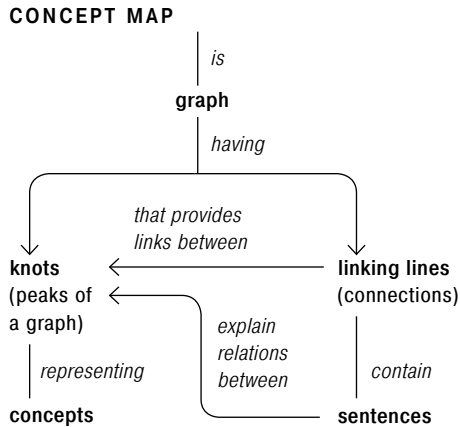
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1. Restructuring knowledge as a result of education

In the two most important frameworks of new knowledge digestion, that is, the theory of cognitive development of J. Piaget and the cultural-historical theory of L. Vygotsky, the structural changes of the emerged system of knowledge are regarded as a base for intellectual growth and are used as a criterion of age periodization. For Piaget, changes in the cognitive structure are a result of interlinked processes of assimilation and accommodation: new information is understood by the existing structure to the extent of the ability of that structure to digest it, and at the same time new information modifies the existing structure [Piaget 2001]. Vygotsky regards education as the acquisition of new sign structures, which themselves gradually become the means for orientation in the activities following on from the next stages of education. The beginning of this process is considered to be the action of providing the child with a sign structure, which in the further process of education is reconstructed and assimilated, so that the knowledge obtained can be nimbly used in solving a whole class of exercises [Vygotsky 1982: 188–202, 244–267, 305; Vygotsky 1983: 78–85, 128, 147–151, 225, 292–316]. Some modern theories of education also directly indicate the importance of the structural reconstruction of the knowledge system during the course of education (for example, [Ausubel 2000; Novak 2002]).

From both fundamental and practical points of view it would be crucial to make certain that education does lead towards reorganization of the whole structure of knowledge, and not just to its quantitative growth. For the traditional means of marked evaluation (a control work or a test), through their configuration it is impossible to establish the changes in the structure of knowledge. They measure acquired skills, but not the way these new skills influence the existing ones, how the hierarchy within the system of new terms is built, what kind of virtue was given to certain elements of knowledge before learning something new and what is given afterwards, not to the changes on the structure of knowledge.

Lately, systems of educational result evaluation have emerged, which give priority to structural changes: for example, the SAM (School Achievements Monitoring) test, based on the theories of development and education of L. Vygotsky, V. Davydov and P. Galperin [Nezhnov, Kardanov, Elkonin 2011] or the method of concept maps created within the framework of the constructivist approach towards education [Novak, Cañas 2008; Lavigne 2005]. However, the developers of the SAM test do not presume a direct assessment of structural changes, but only admit that it is structural reconstruction of the knowledge system which lets pupils solve the tasks of more advanced levels. And as far as concept maps are concerned, today their effectiveness as a means of marked assessment is hard to estimate conclusively.

Figure 1. **The term of the concept map**

Source: <http://www.trizland.ru/trizba/articles/2436>

2. Concept maps as an instrument for assessment of knowledge systems

A concept map (CM) is one of the instruments used for assessment of the changes in the knowledge structure alongside the problem sorting [Novak, Musonda 1991] and clinical interview of J. Piaget [Bringuiet 2000]. A CM is considered to be a graphic representation of terms that refer to a certain topic or a field of knowledge. Usually the knots on the CM stand for the terms, while the ribs or the links between them reveal how these terms are connected to each other in the conception of the respondent (Fig. 1).

For us, it is crucial not only the fact that CMs turn out to be reliable and valid [McClure, Sonak, Suen 1999; Wallace, Mintzes 1990; Stoddart et al. 2000] and the most informative [Lavigne 2005] instrument among the other means to assess the knowledge structure, but also the fact that they have shown good susceptibility to the effects of education [Wallace, Mintzes 1990] and to the emergence, during the education period, of false generalizations and lacunes in the knowledge [Surber, Smith 1981; Lavigne 2005].

In this paper we examine how suitable a CM is for distinguishing the structures of knowledge of people who have different levels of competency in a certain discipline. It has been empirically established that a CM can reveal changes in an individual structure of knowledge that is linked to education (see, for example, [Novak, Musonda 1991; von der Heide 2015]). However, firstly, the subject of assessment in these research works were individual changes in the knowledge structure of pupils in a certain discipline [Wallace, Mintzes 1990], and not common characteristics, that differentiate experienced people from unexperienced. It is quite possible that the instrument is sensitive to individual changes, but by being “deeply qualitative”, it doesn’t allow for generalization—which means that it leaves no space for the comparison of characteristics of the knowledge structure on various levels of competency development.

Secondly, in the available research papers on CM, the work of a pupil with these terms is analyzed, but only the ones that refer to a certain topic or a certain discipline [Lapp, Nyman, Berry 2010; Dauer, Long 2015]. The pupil's activity is assessed based on the criteria specified for a discipline examined; such assessment is important in relation to the diagnosis of the education path, but doesn't reveal the objective laws in the knowledge structure, common to various fields. For instance, it is demonstrated that a certain program of learning physics leads to the formation of two key concepts in pupils' minds, that is "atom" and "molecule", as well as their right linkage with the phenomena observed, with evaporation in particular [Novak, Musonda 1991]. However, this conclusion can't be transferred to another discipline, let us say, statistics, as for statistics it would be important to establish key terms that should be mastered, and with the "right" links of these terms with the phenomena observed. It means that a qualitative, substantial approach towards the analysis of CM doesn't allow one to judge on the applicability of this instrument for a diagnosis of the knowledge structure in various disciplines.

Thirdly, in previous research papers CMs were used rather as a means for education, than as an instrument of comparison assessment. For instance, some authors preferred closed CMs and offered them alongside with a framework of concepts, key for a certain topic or discipline [Wallace, Mintzes 1990; Lapp, Nyman, Berry 2010]. They intended to trace, how the connections between the key terms would change and how the new terms would be added to the map as the pupil learns. However, regarding the assessment, the prescribed framework of key concepts is a short hint for pupils who are beginners and an interrupting factor for those who are advanced in the topic. As the abilities to use such a framework are different in various pupils, its usage brings an uncontrolled possibility of possible error into the assessment, which lowers the reliability of CM as an instrument. In another research pupils were advised to fill in a CM with terms whose prepositional structure was already prepared [Ruiz-Primo et al. 2001]. Such tasks need well-developed relational thinking, which also is an interrupting factor.

Another variant of research design with applying concept maps is presented by their construction by the authors themselves based on clinical interviews with pupils [Novak, Musonda 1991]. The reliability of such a process of CMs remains in question, because it is not so clear what kind of effect any preliminary training of the authors of the research and their assistants has on the final shape of the maps. Besides, a clinical interview allows for specifying questions from interviewers, which could direct pupils towards certain answers and thus bring their share of accidental error in the final assessment.

The methodical diversity of the CM research available and the weak control of the effects of any given variations in the approaches to the work with CM do not allow for viewing on the results obtained

in such research as reliable. This is why the question as to whether a CM can perceive such features of the knowledge structure, which are typical for all individuals and differ depending on the level of competency, remains open.

3. Experts and beginners as contrasting groups

In order to verify the sensibility of CM to common features of the knowledge structure of more competent specialists, it is necessary to compare contrasting groups, that is people who must obviously differ based on objective characteristics in the level of competency in any given field of activities. Contrasting groups may be composed of people who have lengthy work experience and a higher formal qualification in a certain field of knowledge (the group of experts), plus those who have only begun to work or even have just commenced study this field (the group of beginners). A feature of such a—relative [Chi 2011]—approach towards the definition of experts lies in the fact that the term “expert” does not imply an “inherent” superiority of experts compared to beginners, but comes down to gaining experience in solving professional problems, and a formal attribute of experience is used in order to separate experts from beginners.

We are convinced that the knowledge structure of experts and beginners is different, and this judgment is based on the results of many empirical studies. Thus, one of the first important observations was made regarding the organization of expert knowledge: they are better structured and hierarchized [Chi, Glaser, Rees 1982; Kim 2013]. That is, when solving a problem, experts represent it in such a way that the representation itself already contains the basis for the subsequent decision [Jee et al. 2014; Chi, Glaser, Rees 1982]. Secondly, it was shown that experts distribute the time taken to solve a problem in favor of its good representation. They are satisfied with the result only when the representation of the task is brought to the executive level, that is, up to all intermediate actions and goals. Unlike the experts, beginners tend to try different ways of solving the problem, focusing on its individual signs [Lowe, Lowe 1996; Li, Kaiser 2011]. Thirdly, newcomers group tasks according to their external characteristics and proceed to their solution by procedures whose suitability is determined on the basis of these external characteristics [Chase, Simon 1973; Perkins, Salomon 2012]. For example, first-year physics students grouped and solved problems, focusing on their parameters such as the presence in the problem of an inclined plane or a falling body. Experts also grouped tasks on physical principles, such as energy conservation. On these more abstract parameters, they also built an approach to the solution [Van Lehn, Chi 2012]. Other studies also found a more abstract character of the information units allocated by experts in solving problems [Chi, Feltovich, Glaser 1981; Lowe, Lowe 1996; Bläsing, Tenenbaum, Schack 2009].

The described differences in solving problems between experts and novices persisted even when newcomers classified simple prob-

lems, and the type and principle of their solution were well known to them [Sloutsky, Yarlas 2000], and even if the instruction directly oriented them to classification by principle characteristics [Bilalić, Gobet 2009]. On the other hand, experts could classify tasks on the basis of their external similarity if they received the appropriate instruction, but when the instructions did not specify which principles should be classified, experts conducted it on key essential features of tasks, rather than on external similarities. Moreover, it turned out that expert task classifications are consistent among themselves [Ibid.], which may indicate the existence of some “ideal” structure of knowledge in a particular subject or discipline, to which all experts come to experience.

Distinctive features of CM experts were found in almost all fields of activity (sports, academic activities, meteorology, music, chess, etc.), in which the patterns of solving problems were compared by experts and novices (for a review, see [Vergeles 2017]). This means that a structurally complex, highly hierarchical and highly connected structure of expert knowledge can be the result of the development of knowledge as such, regardless of the specific content of the knowledge area, whereas the attention of the beginner to the methods of solving and single characteristics of problems can be a sign of a starting phase on the path to mastering knowledge.

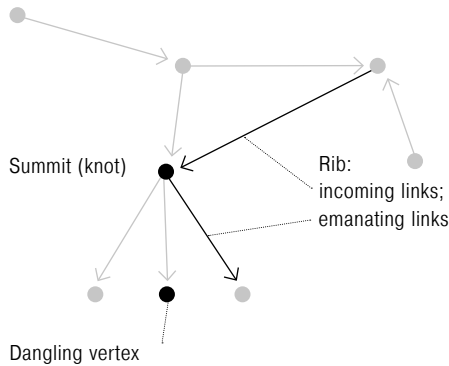
4. Formal indicators of CM

We plan to show that the knowledge structure presented in the form of a CM has formal characteristics common to a certain level of competence development in a particular area of knowledge. By formal characteristics, we mean the structural characteristics of a CM, that is, their properties, which do not depend on the kind of specific concepts used. Formal characteristics of the map, thus, include only nodes and edges between them and do not include the names of concepts and edges. It is formal indicators that are central to our research, because, firstly, it is possible to make the CM evaluation objective and standardized (the same objective indicators are evaluated by the same procedure), and secondly, make such an assessment less dependent on the competence of evaluating and even accessible to non-specialists in the certain field of knowledge.

To analyze the formal characteristics of CMs, we relied on graph theory [Ore 1968], since a map consisting of a set of nodes (or vertices) and a set of links (or edges) is essentially a graph. Figure 2 schematically depicts a graph with its main characteristics.

We believe that CMs have formal characteristics that reflect the above-mentioned features of the knowledge structure. We refer to them as the following: the level of generalization of the concept, the uniformity of generalizations in the structure, complex concepts, single concepts, and the interconnectedness of the structure.

To operationalize the level of generalization of the concept, we simultaneously used two indicators: the volume of the concept and the number of hierarchies that lead the concept. In terms of a graph, the

Figure 2. **Graph and its main characters**

three-dimensionality of a concept can be measured by the number of outgoing edges, and the formation of a hierarchy by outgoing consecutive links to nodes. The volume in itself, that is, the number of outgoing edges may not reflect the level of generalization of the concept if all outgoing links lead to single concepts (without outgoing edges). On the other hand, the only hierarchical connection that emerges from the concept with many consistently subordinate concepts can, in terms of a graph, mean the stages of a process, for example, decision making, which again does not allow us to judge the level of generalization of the “upper” concept. Therefore, it is necessary to take into account both the volume and the presence of hierarchies. We calculated this indicator as the ratio of the volume of concepts (we took the average number of outgoing edges of the three most voluminous concepts in CM) to the level of the hierarchy of emanating concepts. We expected that the level of generalization (taking into account the hierarchy of connections to be understood) will be higher for experts than for beginners.

The uniformity of generalizations in the structure indicates a sequence in the transition from the most general to the individual concepts, the existence of intermediate links. Judging by the data available in the academic literature, with increasing competency of the learner, not only does hierarchy appear in the structure of his knowledge, but also becomes increasingly complex, detailed, representing all possible levels of generalization, the hierarchy of the concepts learned. So, we expected that the experts will be using concepts with intermediate levels of generalization, thereby revealing a more even structure of knowledge, while the beginners will be preferring extreme levels, i. e. to build direct ribs between very general and single concepts without using intermediate levels of generalization. This indicator we calculated as the average difference in the volume of the three most voluminous concepts.

Complex concepts are the result of the interaction of several other concepts. We expected that complex concepts will occur more often in the group of experts than beginners. The indicator was calculated by the number of adjacent ribs, that is, ribs having a common node.

Single concepts have no other connections, except one incoming. We expected that the beginners will have more single concepts than the experts. The indicator was calculated as the number of hanging nodes in the map.

The linkage of structure is an indicator of the density of connections between concepts. We expected that the experts will have a higher degree of connectedness of the map. The indicator was calculated as the ratio of the number of concepts to the number of ribs between them.

We expected that within the contrast groups the CMs will be similar in all the indicators indicated. The task of our work was, therefore, to show the distinctive ability of the CM in a theoretically expected direction in contrasting groups of specialists in terms of competence.

5. Quality indicators of CM

Another research task was to confirm that, in addition to formal characteristics, CMs have certain qualities, which, as already documented in the scientific literature, vary among the groups of beginners and experts. By qualitative indicators we mean the content of concepts and links on the CM, depending on the specific area of knowledge: what concepts are exactly used and what exactly the edges between them are called. Qualitative assessment can be carried out only by specialists in this field, and in this sense it depends on the characteristics of the appraisers themselves, that is, it is subjective. Nevertheless, it is also important because if we find the correspondence of qualitative CM indicators of our contrast groups in the data previously obtained, we will confirm the constructive divisibility of open (that is not containing a given list of concepts) CM as a tool for assessing the structure of knowledge of experts and beginners.

We analyze three qualitative indicators of the structure of knowledge. First, we expected to see a common set of key concepts in the group of experts. Numerous studies of problem solving problem by experts and beginners have shown that in any field the experts have a common understanding of what is the key (that is, structure-forming) information in their professional tasks, but the beginners do not yet have the key knowledge to solve professional problems. Accordingly, there should not be a common set of concepts common to all beginners—neither analogous to the expert, nor any other. Secondly, we expected that the experts will be predominantly using concepts related to so-called declarative knowledge (ideas, theories, concepts), and the beginners will be using concepts related to the methods of solving the problem, that is, with procedural knowledge, as shown in previous experiments [Chi, Feltovich, Glaser 1981; Sloutsky, Yarlus 2000; Stylianou 2002; Rittle-Johnson, Schneider 2014]. Thirdly, we

assumed that the beginners will make mistakes, linking concepts, and the experts won't. In all the studies known to us, without exception, errors of binding concepts in novices were fixed, although they did not use the open form of CM. Therefore, having discovered errors in the group of newcomers and not finding them in the group of experts, we also confirm the constructive validity of open CMs.

6. The design

6.1. Panel

The subject area in which we compared the CM of the experts and beginners was through methods of statistical data analysis. Thirteen respondents participated in the study. Nine of them, who made up the group of beginners, are students in their first year of a master's degree who have successfully completed a course on statistical analysis. All of them used quantitative data analysis while writing their term paper and had not performed more than one year of work related to the analysis of data. Some of the beginners had preliminary knowledge in statistical analysis, obtained during training in their Bachelor degree program.

A group of experts (four people) was made up of professors of data analysis methods, each with work experience of more than four years, and having at least six publications with statistical data analysis results in peer-reviewed journals. Such professional experience was demanded of each expert, quite conditionally. However, such characteristics are "appointed" expertly in all the other studies of beginners and experts carried out in the already noted relative approach. For us, the main criteria for selecting experts were the experience of teaching and the availability of publications that used data analysis as evidence at a certain level of expertise. The adopted criterion is rather conservative from the point of view of our goals: if there are differences between the CM of beginners and CM of experts at this level already, they can all the more be expected when compared with more qualified specialists.

6.2. Instruments and procedures

The study was conducted individually. First, the respondents became acquainted with the instructions for constructing concept maps. The instructions were given in written form and contained examples of maps on other subject areas. Once acquainted with the instructions, the respondents, if they had questions, could ask them to the experiment conductor, and then they made up a conceptual map on the topic of "Statistical Data Analysis". The task of constructing the map was presented in an open form: the instruction contained only a topic and did not contain a list of concepts. During the development of the map, no additional instructions, advice, or comments were received by the respondents. The time was not limited for the participants, while the terms of the assignment varied greatly from the respondent to the respondent: the minimum duration was 45 minutes, the maximum was about two hours. During the creation of the maps, one of the authors of this article was present in the same room as the respondent.

Table 1. Mean values and deviations of formal indicators of conceptual maps for beginners and experts

	Knots	Ribs	Connect- edness	Hanging knots	Adjoining ribs	Value (level)			Hierarchic level	The level of generality
						1st	2-nd	3-rd		
The beginners	20.6 (5.5)	17.0 (6.4)	1.4 (0.7)	12.0 (5.9)	2.8 (3.8)	6.7 (4.7)	2.2 (1.01)	1.6 (1.1)	6.6 (3.5)	0.8 (0.8)
The experts	14.3 (5.3)	17.8 (6.6)	0.8 (0.01)	2.5 (3)	11.0 (4)	3.5 (1.3)	2.3 (0.5)	2.0 (0.8)	9.8 (3.6)	0.3 (0.06)

Note: standard deviations are given in brackets.

Figure 3. An example of an expert's map

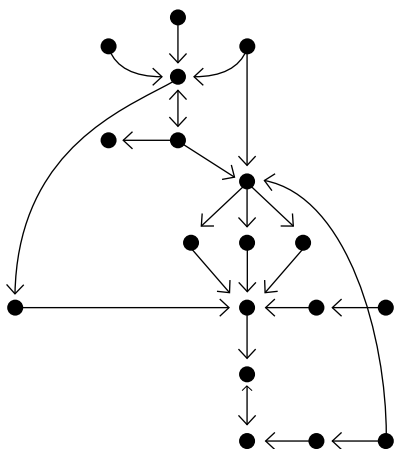
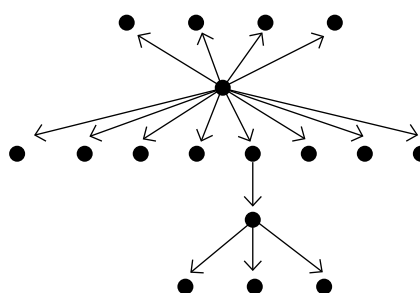


Figure 4. An example of a beginner's map



7. Results

7.1. The analysis of formal indicators of CM

We calculated the average values of formal CM indicators for contrast groups (Table 1). To assess the significance of differences in the indexes between contrast groups, a nonparametric Mann-Whitney test was used, suitable for cases where the nature of data distribution in a small sample is unknown.

The degree of generalization of the concepts used in the map was calculated as the ratio between the bulk of the largest concept (the number of edges coming from it) and the number of hierarchical knots, that is, the knots that have both inbound and outbound connections. It was found that contrast group contrasts significantly differed in level of generality ($U=0, p < 0.01$)¹. The examples of expert and beginners maps are shown in Fig. 3 and 4.

¹ The Mann-Whitney criterion was used, since the necessary condition for the t-test is that the distribution is normal.

Another important indicator of the generalization of terms used in the CM is the average difference in the volume of the three most voluminous concepts, which also differs significantly in expert groups and newcomers ($U=0, p < 0.01$). This indicator reflects the uniformity of generalizations in the structure of knowledge and the existence of transitional concepts on the level of generalization that connect the most common concept with individual ones. The experts of the generalization are more uniform, since the most voluminous concepts contain approximately the same number of links (3.5, 2.3 and 2.0), whereas newcomers use concepts that differ sharply in terms of generalization (6.7, 2.2; 1.6).

Although the groups of experts and beginners did not differ in the average number of knots in the CM, nor in the ribs ($U_{\text{knots}} = 6.5, p > 0.05, U_{\text{ribs}} = 19.5, p > 0.05$), the ratio of the number of knots and ribs to individual level by the Mann-Whitney criterion was statistically significant and varied in the two groups ($U=0, p < 0.01$). As expected, the level of cohesion of CM among experts was higher than that of beginners.

The number of single concepts themselves, that is hanging knots, was significantly larger for the beginners than for the experts (12.0 and 2.5, respectively, $U=2.5, p < 0.01$), whereas complex concepts, that is, knots with adjacent edges, were larger in the experts ($M_{\text{experts}} = 11.0, SD = 4.1, M_{\text{beginners}} = 2.8, SD = 3.2$).

7.2. Quality analysis of CM

As a result of the analysis of qualitative characteristics of knowledge structuring, we have revealed three distinctive features of beginners' maps: the absence of a unified set of concepts used; preferential use of procedural concepts; and erroneous connections between concepts.

The absence of a unified set of concepts used. A set of concepts common for a group of experts is treated as a key for this area of knowledge. In the literature, key concepts, as a rule, are considered to be found in more than half of the experts [Wallace, Mintzes 1990]. Our experts in this capacity were the following concepts: "hypothesis", "data", "analysis", "variables" and "results." They were used by all of the experts without exception. These concepts really reflect the basic elements of the statistical data analysis, since they determine the general approach to analysis, the choice of methods, the logic of all the procedures used and the interpretation. The beginners used only the terms "variables" and "data" from this list and in fact ignored the "hypothesis", "analysis" and "results." It was impossible to exclude the possibility that the beginners singled out some other concepts as the key ones. However, it turned out that their cards almost did not have the same concepts, which may indicate the absence of formed key concepts at the initial level of competence development.

The predominant use of procedural concepts. The available data on the specifics of problem solving by the experts and the beginners

give reason to expect the experts to preemptively use concepts related to the so-called declarative knowledge (ideas, theories, concepts), and for the beginners to use procedural concepts [Rittle-Johnson, Schneider 2014]. Indeed, in addition to general concepts that are key to the field (“hypothesis”, “research question”, “analysis”, etc.), the CM of experts contained other theoretically loaded concepts, for instance, “sample”, “connection”, “differences” or “concepts,” “models,” “covariates,” “interpretation of results,” “research problems,” and “method.” The beginners preferred procedural concepts that describe actions for analyzing data. For example, they listed the types of regression analysis or the steps necessary to implement it.

Erroneous connections between concepts. Unlike the experts, the beginners often established erroneous connections between concepts. For example, it is erroneous to interpret “variables” as a form of describing “data,” or “inference,” which follows directly from the “constructed model,” or an explanatory function of “statistics” in relation to “research,” or a closed cyclical relationship between the concepts “data analysis”, “variables” and “data”.

8. Interpretation

The purpose of this study was twofold. Firstly, we wanted to theoretically define such formal CM indicators that would reflect certain features of the knowledge structure. Secondly, we wanted to make sure of the distinctive ability of these indicators by comparing two contrast groups—beginners and experts—in a certain area of knowledge. Both goals were achieved: indeed, it was empirically established that the theoretically distinguished characteristics of the CM differ between the group of experts and beginners in the field of statistical methods of data analysis. Such characteristics were presented by: the level of generalization of the concepts used, the presence of concepts of different levels of generalization, the connectedness of concepts with each other, and the share of complex and individual concepts. In other words, as a result of our work, the characteristics of the structure of knowledge, differing, judging by the data of previous studies, from experts and novices, received their indicator elements in the CM. These indicators, considered here as elements of the graph, are formally described as the ratios of the different types of nodes and edges presented in the map.

It is important to note that it was such a formal approach which made it possible to transform highly individualized CMs into a set of objective parameters that are independent of the professional level of the card evaluators themselves. Thus, CMs are derived from the range of tools of individualized assessment in the area of objective evaluation, are placed in line with other standardized methods of evaluation. Previous work has shown that CMs are sensitive to individual changes in the structure of knowledge as the level of competence rises. Our results testify that CMs are suitable for use in comparative studies.

The establishment of the discriminative capacity of a number of indicators is only the first step in confirming the diagnostic potential of the CM. But the formal approach proposed by us ensures the availability of CM for further checks: from the reliability of the indicators to the constructive validity. For example, from the point of view of reliability, it is certainly necessary to demonstrate the retest stability of all the declared indicators. To confirm the constructive existence it is important to obtain support for the proposed interpretation of our indicators. After all, the calculation of the various elements in the map does not automatically lead to their interpretation in terms of the structure of knowledge. Here we logically assumed that the elements and their relationship reflect certain characteristics of the structure of knowledge, for example, the ratio of the number of knots and links reflects the connectedness of concepts, and the hanging knots are concepts that the respondent regards as single. We showed that these indicators take different values in contrast groups, and these differences are exactly what we expected, but, of course, more fundamental support for our interpretation is required here.

We see the perspectives of this work in the logic of theoretical views of L. Vygotsky regarding the development of scientific concepts, since the formation of these concepts reflects a conceptual map. Vygotsky assumed that the course of development of scientific concepts is opposed to the ways of development of everyday concepts [Vygotsky 1982]. If everyday concepts develop from the recognition of individual phenomena or objects pointed at by the concept, to an understanding of the abstract meaning of the concept itself, then the scientific concept is immediately given as an abstract meaning, and its development proceeds in the direction of comprehending the object represented in it. Signs of the maturity of the concept (any: both everyday, and scientific) is what Vygotsky calls the possibility of linking it logically with other concepts, immersing him in the hierarchical system of other concepts of different levels of generalization.

Some of Vygotsky's theoretical assumptions were reflected in the composition of the indicators we identified. So, for example, we used the indicator of the degree of generalization of the concept as a fraction of outgoing hierarchical relations among all outgoing from this notion of edges. The indicator, which we called "uniformity of generalization," was calculated as the average difference in the volume of the three most voluminous concepts in CM, suggesting that experts, unlike beginners, will use the concepts of all levels of generalization—in full accordance with the Vygotsky's idea of that the mature concept should function in a system of other concepts of different levels of generalization. Vygotsky seems to be very promising in terms of planning further work on CM analysis. On the other hand, it is possible that the concept map method can be used for empirical support of the theory itself.

A serious limitation of our research is that we checked the discriminative power of formal CM indicators on a single sample, and, moreover, the sample is homogeneous and small. Small numbers alone do not pose a great threat to pilot research. First, because its purpose is to approbate a new method of analysis rather than a rigorous assessment of the characteristics of the respondents. Secondly, research with conceptual maps as a deeply qualitative method is applied only individually, requires a lot of time and is usually used on small samples: for example, $n = 19$ [Jeong, Lee 2012], $n = 3$ [Lavigne 2005], $n = 8$ [Kandiko, Kinchin 2012], $n = 11$ [McNeil 2015]. However, together with the homogeneity of the selection, the small number of our groups of respondents prevents the dissemination of the findings to other areas of knowledge. And although the qualitative block of our work led to results that coincide with those obtained with the help of CM in other studies (for example, about erroneous connections between concepts or about the primary use of procedural concepts by beginners), it is absolutely necessary to study the CM patterns for the beginners and experts further. The first results, obtained with the help of the proposed quantitative method of analysis of conceptual maps, look encouraging.

References

- Ausubel D. P. (2000) *The Acquisition and Retention of Knowledge: A Cognitive View*. Dordrecht: Kluwer Academic Publishers.
- Bilalić M., Gobet F. (2009) They Do What They Are Told to Do: The Influence of Instruction on (Chess) Expert Perception-Commentary on Linhares and Brum (2007). *Cognitive Science*, vol. 33, no 5, pp. 743–747.
- Bläsing B., Tenenbaum G., Schack T. (2009) The Cognitive Structure of Movements in Classical Dance. *Psychology of Sport and Exercises*, vol. 10, no 3, pp. 350–360.
- Bringuier J.-C. (2000) Besedy s Zhanom Piazhe [Conversations with Jean Piaget]. *Psikhologicheskii zhurnal*, vol. 21, no 4, pp. 107–111.
- Chase W. G., Simon H. A. (1973) The Mind's Eye in Chess. *Visual Information Processing* (ed. W. G. Chase), New York: Academic Press, pp. 215–281.
- Chi M. T.H. (2011) Theoretical Perspectives, Methodological Approaches, and Trends in the Study of Expertise. *Expertise in Mathematics Instruction: An International Perspective* (ed. Y. Li), New York, NY: Springer, pp. 17–39.
- Chi M. T.H., Feltovich P., Glaser R. (1981) Categorization and Representation of Physics Problems by Experts and Novices. *Cognitive Science*, vol. 5, no 2, pp. 121–152.
- Chi M. T.H., Glaser R., Rees E. (1982) Expertise in Problem Solving. *Advances in the Psychology of Human Intelligence. Vol. 1* (ed. R. J. Sternberg), Hillsdale, NJ: Lawrence Erlbaum Associates, pp. 7–76.
- Dauer J. T., Long T. M. (2015) Long-Term Conceptual Retrieval by College Biology Majors Following Model-Based Instruction. *Journal of Research in Science Teaching*, vol. 52, no 8, pp. 1188–1206.
- Jee B. D., Gentner D., Uttal D. H., Sageman B., Forbus K., Manduca C. A., Tikoff B. (2014) Drawing on Experience: How Domain Knowledge Is Reflected in Sketches of Scientific Structures and Processes. *Research in Science Education*, vol. 44, no 6, pp. 859–883.

- Jeong A., Lee W. J. (2012) Developing Causal Understanding with Causal Maps: The Impact of Total Links, Temporal Flow, and Lateral Position of Outcome Nodes. *Educational Technology Research and Development*, vol. 60, no 2, pp. 325–340.
- Kandiko C. B., Kinchin I. M. (2012) What Is a Doctorate? A Concept-Mapped Analysis of Process Versus Product in the Supervision of Lab-Based PhDs. *Educational Research*, vol. 54, no 1, pp. 3–16.
- Kim M. (2013) Concept Map Engineering: Methods and Tools Based on the Semantic Relation Approach. *Educational Technology Research and Development*, vol. 61, no 6, pp. 951–978.
- Lapp D. A., Nyman M. A., Berry J. S. (2010) Student Connections of Linear Algebra Concepts: An Analysis of Concept Maps. *International Journal of Mathematical Education in Science and Technology*, vol. 41, no 1, pp. 1–18.
- Lavigne N. C. (2005) Mutually Informative Measures of Knowledge: Concept Maps Plus Problem Sorts in Statistics. *Educational Assessment*, vol. 10, no 1, pp. 39–71.
- Li Y., Kaiser G. (eds) (2011) *Expertise in Mathematics Instruction: An International Perspective*. New York, NY: Springer Science+Business Media.
- Lowe R. K., Lowe K. (1996) Background Knowledge and the Construction of a Situational Representation from a Diagram. *European Journal of Psychology of Education*, vol. 11, no 4, pp. 377–397.
- McClure J.R., Sonak B., Suen H. K. (1999) Concept Map Assessment of Classroom Learning: Reliability, Validity, and Logistical Practicality. *Journal of Research in Science Teaching*, vol. 36, no 4, pp. 475–492.
- McNeil S. (2015) Visualizing Mental Models: Understanding Cognitive Change to Support Teaching and Learning of Multimedia Design and Development. *Educational Technology Research and Development*, vol. 63, no 1, pp. 73–96.
- Nezhnov P., Kardanova E., Elkonin B. (2011) Otsenka rezultatov shkolnogo obrazovaniya: strukturnyy podkhod [Measuring Educational Outputs: One Possible Approach]. *Voprosy obrazovaniya / Educational Studies*. Moscow, no 1, pp. 26–43. DOI: 10.17323/1814–9545–2011–1–26–43
- Novak J. D. (2002) Meaningful Learning: The Essential Factor for Conceptual Change in Limited or Inappropriate Propositional Hierarchies Leading to Empowerment of Learners. *Science Education*, vol. 86, no 4, pp. 548–571.
- Novak J. D., Cañas A. J. (2008) *The Theory Underlying Concept Maps and How to Construct Them*. Technical Report of the Florida Institute for Human and Machine Cognition. Available at: <https://cmap.ihmc.us/docs/theory-of-concept-maps> (accessed 10 November 2017).
- Novak J. D., Musonda D. (1991) A Twelve-Year Longitudinal Study of Science Concept Learning. *American Educational Research Journal*, vol. 28, no 1, pp. 117–153.
- Ore Ø. (1968) *Teoriya grafov* [Theory of Graphs], Moscow: Nauka.
- Perkins D. N., Salomon G. (2012) Knowledge to Go: A Motivational and Dispositional View of Transfer. *Educational Psychologist*, vol. 47, no 3, pp. 248–258.
- Piaget J. (2001) Teoriya Piazhe [Piaget’s Theory]. *Zhan Piazhe: teoriya, eksperimenty, diskussii* [Jean Piaget: Theory, Experiments, Discussions] (eds. L. Obukhova, G. Burmenskaya), Moscow: Gardariki, pp. 106–157.
- Rittle-Johnson B., Schneider M. (2014) Developing Conceptual and Procedural Knowledge of Mathematics. *Oxford Handbook of Numerical Cognition* (eds R. C. Kadosh, A. Dowker), Oxford, UK: Oxford University.
- Ruiz-Primo M.A., Schultz S. E., Li M., Shavelson R. J. (2001) Comparison of the Reliability and Validity of Scores from Two Concept-Mapping Techniques. *Journal of Research in Science Teaching*, vol. 38, no 2, pp. 260–278.

- Sloutsky V. M., Yarlas A. S. (2000) Problem Representation in Experts and Novices: Part 2. Underlying Processing Mechanisms. Proceedings of the *XXII Annual Conference of the Cognitive Science Society*, pp. 475–480.
- Stoddart T., Abrams R., Gasper E., Canaday D. (2000) Concept Maps as Assessment in Science Inquiry Learning—A Report of Methodology. *International Journal of Science Education*, vol. 22, pp. 1221–1246.
- Stylianou D. A. (2002) On the Interaction of Visualization and Analysis: The Negotiation of a Visual Representation in Expert Problem Solving. *Journal of Mathematical Behavior*, vol. 21, no 3, pp. 303–317.
- Surber J. R., Smith P. L. (1981) Testing for Misunderstanding. *Educational Psychologist*, vol. 16, no 3, pp. 165–174.
- Van Lehn K., Chi M. (2012) Adaptive Expertise as Acceleration of Future Learning: A Case Study. *Adaptive Technologies for Training and Education* (eds P. J. Durlach, A. M. Lesgold), Cambridge: Cambridge University. P. 28–45.
- Vergeles K. (2017) *Osobennosti v sposobakh reprezentatsii problemy, yeye otsenke i podkhodakh k resheniyu u ekspertov. Sistematicheskii obzor* [Special Characteristics of Problem Representation, Assessment and Solution by Experts: A systematic Review] (Master's Thesis, School of Psychology, NRU HSE) (unpublished).
- Von der Heide T. (2015) Concept Maps for Assessing Change in Learning: A Study of Undergraduate Business Students in First-Year Marketing in China. *Assessment & Evaluation in Higher Education*, vol. 40, no 2, pp. 286–308.
- Vygotsky L. (1982) Myshlenie i rech' [Thinking and Speech]. *Sobranie sochineniy L. Vygotskogo v 6 t. T. 2* [The Collected Works of Lev Vygotsky in Six Volumes. Vol. 2], Moscow: Pedagogika.
- Vygotsky L. (1983) Istoriya razvitiya vysshikh psikhicheskikh funktsiy [The History of the Development of Higher Mental Functions]. *Sobranie sochineniy L. Vygotskogo v 6 t. T. 3* [The Collected Works of Lev Vygotsky in Six Volumes. Vol. 3], Moscow: Pedagogika, pp. 5–328.
- Wallace J. D., Mintzes J. J. (1990) The Concept Map As a Research Tool: Exploring Conceptual Change in Biology. *Journal of Research in Science Teaching*, vol. 27, no 10, pp. 1033–1052.

Smart, Pretty or Independent: Who Is Popular at School?

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Abstract Sixty-two semi-structured interviews with students of grades 9–11 in 15 schools and a survey of 2,376 ninth-graders from 55 schools were used to identify Russian teenagers' perceptions of popularity and assess gender differences in the factors of popularity. It transpires that 40–50% of school students reject the very notion of “popular” as inequality-inducing. Such attitudes are probably in coherence with collectivistic values that are prevalent in Russian society as opposed to individualistic ones. Students perceived as popular by their peers are characterized as exhibiting prosocial behavior. “The life and soul of the party” was the most frequent characteristic of popular teenagers used in students' descriptions; “attractive”, “very smart” and “acknowledges no authority” were mentioned slightly less often. Girls are more likely to be classified as popular for their good-looking appearance and sense of style, while boys are revered for sports achievements, arguments with teachers, independence and ability to stand up for themselves. Intellect and sociability are regarded as equally strong factors of popularity for both boys and girls. High status in a class is associated with social approval and support, academic achievements and prosocial behavior. Russian school students differ from their Western peers in their notion and perceptions of popularity.

Keywords school, teenager, perceived popularity, gender differences.

- References**
- Adams N., Bettis P. (2003) Commanding the Room in Short Skirts: Cheering as the Embodiment of Ideal Girlhood. *Gender and Society*, vol. 17, no 1, pp. 73–91.
 - Adler P. A., Kless S. J., Adler P. (1992) Socialization to Gender Roles: Popularity among Elementary School Boys and Girls. *Sociology of Education*, vol. 65, no 3, pp. 169–187.
 - Ahn H. J., Garandeanu C. F., Rodkin P. C. (2010) Effects of Classroom Embeddedness and Density on the Social Status of Aggressive and Victimized Children. *The Journal of Early Adolescence*, vol. 30, no 1, pp. 76–101.
 - Allen J. P., Porter M. R., McFarland F. C., Marsh P., McElhaney K. B. (2005) The Two Faces of Adolescents' Success with Peers: Adolescent Popularity, So-

- cial Adaptation, and Deviant Behavior. *Child Development*, vol. 76, no 3, pp. 747–760.
- Asher S. R. (1983) Social Competence and Peer Status: Recent Advances and Future Directions. *Child Development*, vol. 54, no 6, pp. 1427–1434.
- Bagwell C. L., Newcomb A. F., Bukowski W. M. (1998) Preadolescent Friendship and Peer Rejection as Predictors of Adult Adjustment. *Child Development*, vol. 69, no 1, pp. 140–153.
- Bronfenbrenner U. (1943) A Constant Frame of Reference for Sociometric Research. *Sociometry*, vol. 6, no 4, pp. 363–397.
- Chen X., French D. C. (2008) Children's Social Competence in Cultural Context. *Annual Review of Psychology*, vol. 59, pp. 591–616.
- Chen X., He Y., Oliveira A. M. D., Coco A. L., Zappulla C., Kaspar V., DeSouza A. (2004) Loneliness and Social Adaptation in Brazilian, Canadian, Chinese and Italian Children. *Journal of Child Psychology and Psychiatry*, vol. 45, no 8, pp. 1373–1384.
- Chen X., French D. C., Schneider B. H. (2006) *Peer Relationships in Cultural Context*. New York: Cambridge University.
- Cheraneva E. (2008) Osobennosti konfliktного povedeniya podrostkov raznogo sotsiometricheskogo statusa v uchenicheskoy gruppe [Conflict Behavior of Teenagers of Different Sociometric Status in Student Groups]. *Vestnik Vyatskogo gosudarstvennogo gumanitarnogo universiteta*, vol. 1, no 3, pp. 138–141.
- Chernyavskaya V., Andreeva Y. (2016) Uchebnaya motivatsiya pervoklassnikov s raznymi sotsiometricheskimi statusami, na primere uchenikov 1-go klassa MBOUSOSH № 35, g. Vladivostok [Motivation for Learning in First-Graders of Different Sociometric Status through the Example of First-Grade Students of Secondary General Education School No 2, Municipal Budgetary Institution of General Education, Vladivostok]. *Kontsept*, no S11, pp. 14–21. Available at: <http://e-koncept.ru/2016/76130.htm> (accessed 1 November 2017).
- Cillessen A. H. N., Mayeux L. (2004) From Censure to Reinforcement: Developmental Changes in the Association between Aggression and Social Status. *Child Development*, vol. 75, no 1, pp. 147–163.
- Cillessen A. H. N., Rose A. J. (2005) Understanding Popularity in the Peer System. *Current Directions in Psychological Science*, vol. 14, no 2, pp. 102–105.
- Cillessen A. H. N., Schwartz D., Mayeux L. (2011) *Popularity in the Peer System*. New York: Guilford.
- Closson L. M. (2009) Status and Gender Differences in Early Adolescents' Descriptions of Popularity. *Social Development*, vol. 18, no 2, pp. 412–426.
- Coleman J. S. (1961) *The Adolescent Society*. New York: The Free Press.
- De Bruyn E. H., Cillessen A. H. N., Wissink I. B. (2010) Associations of Peer Acceptance and Perceived Popularity with Bullying and Victimization in Early Adolescence. *The Journal of Early Adolescence*, vol. 30, no 4, pp. 543–566.
- De Bruyn E. H., van Den Boom D. C. (2005) Interpersonal Behavior, Peer Popularity, and Self-Esteem in Early Adolescence. *Social Development*, vol. 14, no 4, pp. 555–573.
- Dijkstra J. K., Cillessen A. H., Lindenberg S., Veenstra R. (2010) Same-Gender and Cross-Gender Likeability: Associations with Popularity and Status Enhancement: The TRAILS Study. *The Journal of Early Adolescence*, vol. 30, no 6, pp. 773–802.
- Eder D., Kinney D. A. (1995) The Effect of Middle School Extra Curricular Activities on Adolescents' Popularity and Peer Status. *Youth and Society*, vol. 26, no 3, pp. 298–324.
- Girlando A. P., Eduljee N. B. (2010) An Empirical Investigation of the Malleability of Hofstede's Cultural Dimensions: The Case of the United States and Russia. *Journal of Transnational Management*, vol. 15, no 3, pp. 265–289.

- Gommans R., Müller C. M., Stevens G. W., Cillessen A. H., Ter Bogt T. F. (2017) Individual Popularity, Peer Group Popularity Composition and Adolescents' Alcohol Consumption. *Journal of Youth and Adolescence*, vol. 46, no 8, pp. 1716–1726.
- Gommans R., Segers E., Burk W. J., Scholte R. H. (2015) The Role of Perceived Popularity on Collaborative Learning: A Dyadic Perspective. *Journal of Educational Psychology*, vol. 107, no 2, pp. 599–608.
- Gorman A. H., Kim J., Schimmelbusch A. (2002) The Attributes Adolescents Associate with Peer Popularity and Teacher Preference. *Journal of School Psychology*, vol. 40, no 2, pp. 143–165.
- Gummerum M., Keller M. (2008) Affection, Virtue, Pleasure, and Profit: Developing an Understanding of Friendship Closeness and Intimacy in Western and Asian Societies. *International Journal of Behavioral Development*, vol. 32, no 3, pp. 218–231.
- Hawke S., Rieger E. (2013) Popularity, Likeability, and Risk-Taking in Middle Adolescence. *Health*, vol. 5, no 6, pp. 41–52.
- Hofstede G., Hofstede G. J., Minkov M. (2010) *Cultures and Organizations: Software of the Mind*. New York: McGraw-Hill.
- Kennedy E. (1995) Correlates of Perceived Popularity among Peers: A Study of Race and Gender Differences among Middle School Students. *Journal of Negro Education*, vol. 64, no 2, pp. 186–195.
- Khlybova E. (2009) Osobennosti sotsiometricheskogo statusa mladshikh i starshikh podrostkov [Sociometric Status Characteristics of Early and Late Adolescents]. *Vestnik Kostromskogo gosudarstvennogo universiteta im. N. A. Nekrasova. Ser. "Gumanitarnye nauki: Pedagogika. Psikhologiya. Sotsialnaya rabota. Akmeologiya. Yuvenologiya. Sotsiokinetika*, vol. 15, no 1, pp. 166–169.
- Kiefer S. M., Wang J. H. (2016) Associations of Coolness and Social Goals with Aggression and Engagement during Adolescence. *Journal of Applied Developmental Psychology*, vol. 44, pp. 52–62.
- Koch H. L. (1933) Popularity in Preschool Children: Some Related Factors and a Technique for its Measurement. *Child Development*, vol. 4, no 2, pp. 164–175.
- Kolominsky Y. (1973) *Chelovek sredi lyudey* [A Human among Humans]. Moscow: Molodaya gvardiya.
- Kuteynikova V. D. (2013) Vzaimosvyaz sistemy tsennostnykh orientatsiy starshikh podrostkov so statusnym polozheniem v uchenicheskoy gruppe [The Relationship between Late Adolescents' Social Value Orientations and Their Student Group Status]. *Psikhologicheskaya nauka i obrazovanie (www.psyedu.ru)*, no 2, pp. 68–80.
- La Greca A. M., Harrison H. M. (2005) Adolescent Peer Relations, Friendships, and Romantic Relationships: Do They Predict Social Anxiety and Depression? *Journal of Clinical Child and Adolescent Psychology*, vol. 34, no 1, pp. 49–61.
- LaFontana K. M., Cillessen A. H. N. (2002) Children's Perceptions of Popular and Unpopular Peers: A Multimethod Assessment. *Developmental Psychology*, vol. 38, no 5, pp. 635–647.
- Lease A. M., Kennedy C. A., Axelrod J. L. (2002) Children's Social Constructions of Popularity. *Social Development*, vol. 11, no 1, pp. 87–109.
- Litwack S. D., Aikins J. W., Cillessen A. H. N. (2012) The Distinct Roles of Sociometric and Perceived Popularity in Friendship: Implications for Adolescent Depressive Affect and Self-Esteem. *The Journal of Early Adolescence*, vol. 32, no 2, pp. 226–251.
- López-Pérez B., Gummerum M., Keller M., Filippova E., Gordillo M. V. (2015) Sociomoral Reasoning in Children and Adolescents from Two Collectivis-

- tic Cultures. *European Journal of Developmental Psychology*, vol. 12, no 2, pp. 204–219.
- Mayeux L., Sandstrom M. J., Cillessen A. H. N. (2008) Is Being Popular a Risky Proposition? *Journal of Research on Adolescence*, vol. 18, no 1, pp. 49–74.
- Meijs N., Cillessen A. H., Scholte R., Segers E., Spijkerman R. (2010) Social Intelligence and Academic Achievement as Predictors of Adolescent Popularity. *Journal of Youth and Adolescence*, vol. 39, no 1, pp. 62–72.
- Merten D.E. (1997) The Meaning of Meanness: Popularity, Competition, and Conflict among Junior High School Girls. *Sociology of Education*, vol. 70, no 3, pp. 175–191.
- Moreno J. L. (1934) *Who Shall Survive? A New Approach to the Problem of Human Interrelations*. Washington, DC: Nervous and Mental Disease Publishing Co.
- Ogbu J. U. (2008) Collective Identity and the Burden of “Acting White” in Black History, Community, and Education. *Minority Status, Oppositional Culture, and Schooling* (ed. J. U. Ogbu), New York: Routledge, Taylor, and Francis Group, pp. 29–63.
- Oransky M., Fisher C. (2009) The Development and Validation of the Meanings of Adolescent Masculinity Scale. *Psychology of Men and Masculinity*, vol. 10, no 1, pp. 57–72.
- Owens L., Duncan N. (2009) They Might not Like You but Everyone Knows You: Popularity among Teenage Girls. *The Journal of Student Wellbeing*, vol. 3, no 1, pp. 14–39.
- Parkhurst J. T., Hopmeyer A. (1998) Sociometric Popularity and Peer-Perceived Popularity: Two Distinct Dimensions of Peer Status. *The Journal of Early Adolescence*, vol. 18, no 2, pp. 125–144.
- Read B., Francis B., Skelton C. (2011) Gender, Popularity and Notions of In/Authenticity amongst 12-Year-Old to 13-Year-Old School Girls. *British Journal of Sociology of Education*, vol. 32, no 2, pp. 169–183.
- Realo A., Allik J. (1999) A Cross-Cultural Study of Collectivism: A Comparison of American, Estonian, and Russian Students. *The Journal of Social Psychology*, vol. 139, no 2, pp. 133–142.
- Rean A., Kolominsky Y. (2008) *Sotsialnaya pedagogicheskaya psikhologiya* [Social Psychology of Education]. Saint Petersburg: Praym-Evroznak.
- Reay D. (2001) ‘Spice Girls’, ‘Nice Girls’, ‘Girlies’, and ‘Tomboys’: Gender Discourses, Girls’ Cultures and Femininities in the Primary Classroom. *Gender and Education*, vol. 13, no 2, pp. 153–166.
- Rodkin P. C., Farmer T.W., Pearl R., Van Acker R. (2000) Heterogeneity of Popular Boys: Antisocial and Prosocial Configurations. *Developmental Psychology*, vol. 36, no 1, pp. 14–24.
- Sentse M., Scholte R., Salmivalli C., Voeten M. (2007) Person-Group Dissimilarity in Involvement in Bullying and Its Relation with Social Status. *Journal of Abnormal Child Psychology*, vol. 35, no 6, pp. 1009–1019.
- Skelton C., Francis B., Read B. (2010) “Brains before ‘Beauty’?” High Achieving Girls, School and Gender Identities. *Educational Studies*, vol. 36, no 2, pp. 185–194.
- Suitor J. J., Reavis R. (1995) Football, Fast Cars, and Cheerleading: Adolescent Gender Norms, 1978–1989. *Adolescence*, vol. 30, no 118, pp. 265–270.
- Teunissen H. A., Adelman C. B., Prinstein M. J., Spijkerman R., Poelen E. A., Engels R. C., Scholte R. H. (2011) The Interaction between Pubertal Timing and Peer Popularity for Boys and Girls: An Integration of Biological and Interpersonal Perspectives on Adolescent Depression. *Journal of Abnormal Child Psychology*, vol. 39, no 3, pp. 413–423.
- Titkova V., Ivaniushina V., Alexandrov D. (2013) Populyarnost shkolnikov i obrazovatel'naya sreda shkoly [Pupils’ Popularity and an Educational Setting

- at School]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 4, pp. 145–167.
- Vaillancourt T., Hymel S. (2006) Aggression and Social Status: The Moderating Roles of Sex and Peer-Valued Characteristics. *Aggressive Behavior*, vol. 32, no 4, pp. 396–408.
- Van den Broek N., Deutz M. H., Schoneveld E. A., Burk W. J., Cillessen A. H. (2016) Behavioral Correlates of Prioritizing Popularity in Adolescence. *Journal of Youth and Adolescence*, vol. 45, no 12, pp. 2444–2454.
- Wang S. S., Houshyar S., Prinstein M. J. (2006) Adolescent Girls' and Boys' Weight-Related Health Behaviors and Cognitions: Associations with Reputation and Preference-Based Peer Status. *Health Psychology*, vol. 25, no 5, pp. 658–663.
- Warrington M., Younger M., Williams J. (2000) Student Attitudes, Image and the Gender Gap. *British Educational Research Journal*, vol. 26, no 3, pp. 393–407.
- Xi J., Owens L., Feng H. (2016) Friendly Girls and Mean Girls: Social Constructions of Popularity among Teenage Girls in Shanghai. *Japanese Psychological Research*, vol. 58, no 1, pp. 42–53.
- Xie H., Boucher S. M., Hutchins B. C., Cairns B. D. (2006) What Makes a Girl (or a Boy) Popular (or Unpopular)? African American Children's Perceptions and Developmental Differences. *Developmental Psychology*, vol. 42, no 4, pp. 599–612.
- Zholudeva S., Pugolovkina K. (2016) Osobennosti liderских kachestv u podrostkov s raznym sotsiometricheskim statusom [Leadership Qualities in Teenagers of Different Sociometric Status]. *Vestnik Chelyabinskogo gosudarstvennogo pedagogicheskogo universiteta*, no 8, pp. 126–130.

Teachers' Salary: Expectations and Results Achieved

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Abstract. The article deals with the main trends occurring in the school education system, which are caused by an increase in the average salaries of teachers. The analysis is conducted both

on the basis of official statistics from the Federal State Statistics Service and on results from monitoring the effectiveness of schools conducted by the Center for Continuous Education Economics of The Russian Presidential Academy of National Economy and Public Administration. It is shown that parents don't associate improvement in the quality of teaching with the growth of teachers' salaries. At the same time, they believe that the school performs its functions quite successfully. Teachers themselves are increasingly unhappy with the size of their wages, most of them didn't feel its increase. At the same time, only 6.6% of teachers plan to leave the profession and work in another sphere.

Keywords: education, teachers' salary, school efficiency monitoring, quality of education.

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A teachers' pay increase has a symbolic meaning in regards to Russia's social policy and the implementation of the Presidential decrees of May 7, 2012. The salaries of physicians, university lecturers and particularly researchers fail to attract equally focused attention or arouse such heated discussions. This is not coincidental, since school activity involves, directly or indirectly and on an almost permanent basis, over 50 million Russian citizens—students, their parents, teachers, school administrations and education authorities—and even more considering grandmothers and grandfathers and all those involved in servicing schools. Therefore, any changes in the state of affairs at schools leads to a broad public response and serious social implications because both families and the general public associate the future prospects of both social success and the country's development with quality education for the rising generation.

Translated from
Russian by
T. Gorshunova.

Both Russian and foreign education researchers have repeatedly tried to assess the impact of teachers' pay on the quality of instruction. Many of them believe that the quality of teaching staff and teachers' pay levels do not correlate directly, and mere pay rises and increased total school expenditure can hardly improve students' educational attainment [Hanushek 2008].

Ample evidence shows that schools with a similar student body and teaching staff structure achieve similar educational outcomes despite very different levels of expenditure, including spending on teachers' pay [Gibbons, McNally, Viarengo 2011]. These data are often interpreted as confirming a possibility of optimizing budgetary spending in this area and even the need to do so. However, the existing differences in external contexts and internal environments in schools—otherwise called organizational culture and teacher professionalism—need to be taken into consideration.

On the other hand, the PISA data testify to the fact that teachers' pay and class size (number of students per teacher) have a certain effect on educational outcomes. There is, however, a limit, after which increasing investment does not guarantee higher educational attainment levels [Dolton, Marcenaro-Gutierrez, Still 2014].

Some Russian researchers substantiate the idea that a pay rise in this country will not improve the quality of instruction since the school community views this measure as a just compensation of the debt accumulated over the years. Besides that, a teacher's pay rise is linked to the teaching load as a work intensity indicator [Tipenko 2012; 2014].

The high public value of teachers' pay and the ambiguous findings of scientific research on the issue point to the high relevance of assessing the effectiveness of various remuneration schemes, finding ways of motivating teachers during the introduction of value-for-money contracting and studying teachers' pay expectations and conditions associated with renewing the staffing [Abankina, 2009; Abankina, Filatova 2015].

A number of research papers on teacher remuneration systems discuss the advantages of the weekly workload system of the OECD countries over the teaching load (stavka) system typical of Russia and the CIS countries [Steiner-Khamsi 2016]. The contraposition of the above systems seems unjustified since only the piece-rate and time-rate systems are radically different, while all other systems are various combinations of the two. The narrowness of the approach based on such contraposition attempting to interpret the diverse information on the operation of educational institutions through the prism of the teacher pay system and its impact on school activity may lead to a distortion of the actual situation [Klyachko 2016a].

The increase in the average teacher's pay has given rise to expectations that the quality of schooling will improve significantly, and Russia will rise to higher rankings in international comparative studies. It was also believed that bringing the average remuneration of the

teaching staff in schools to the level of average wages in the relevant constituent entities of the Russian Federation would attract young teachers, and better educated entrants would come to teacher training institutions [RIA Novosti 2016]. Actually, in his famous book *The World Crisis in Education* P. Coombs writes that if the average teaching salary is lower than the average wages in the labour market, schools will attract relatively weak staff because the prestige of the teaching profession will remain low.

It was also expected that an increased teaching salary would rid them of the need to earn on the side, including by tutoring, and leave them more time for professional development. It was teaching skills improvement and application of new teaching technologies at schools that the hopes for an improved quality of education were largely based on. The ideology of value-for-money contracting also proceeded from the premise that teachers would have more time for skills improvement and career development, and they would earn enough without the need to hold multiple jobs [Shugal, Ugolnova 2013].

Based on official data from the Russian Federal State Statistics Service (Rosstat) and the outputs of the School Performance Monitoring undertaken by the Centre for Economics of Lifelong Learning under the Russian Presidential Academy of National Economy and Public Administration, the present paper will look into whether these expectations have been justified after five years of work under new conditions, and what impact the increase in teachers' pay has had on the extent of parents' satisfaction with the quality of schooling as well as on the teachers' attitudes to ongoing changes.

Teaching salary dynamics over the past four years

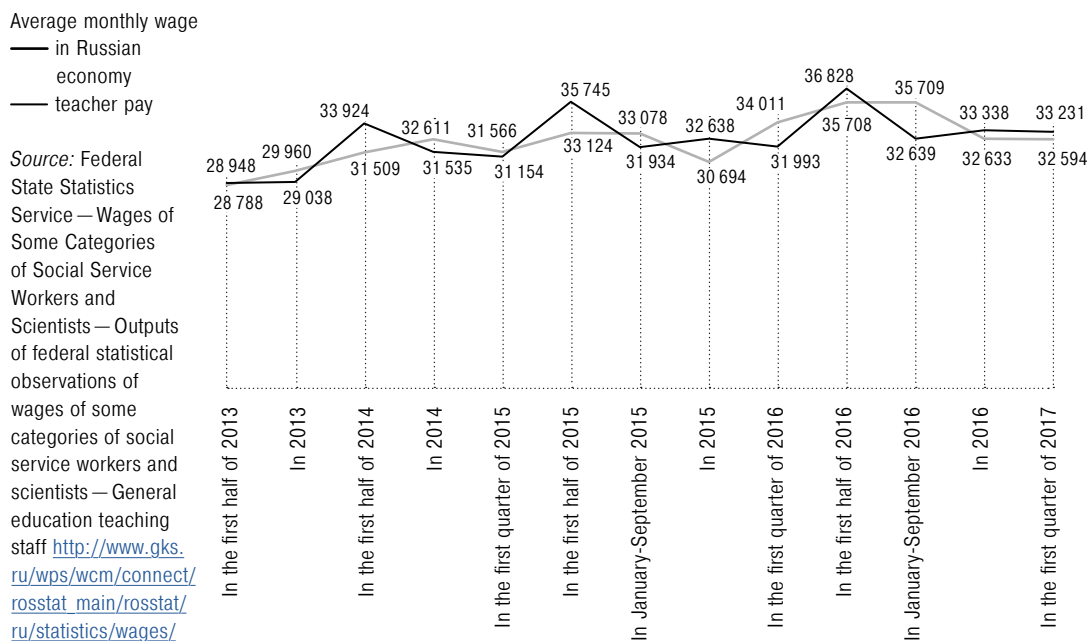
According to Rosstat, teachers' average pay has considerably increased since the beginning of 2013 (Fig. 1).

From the first quarter of 2013 through to the first quarter of 2017, teachers' pay in the Russian Federation increased by an average of 5,891 roubles, or 21.5 per cent. Figure 1 shows that the average teachers' pay changes cyclically. It slightly goes down in the first quarter, rises at the end of the first half-year, declines by the end of the third quarter and increases again by the close of the year.

At the end of 2015, average wage calculation in the economy was changed in order to ease the burden on regional budgets responsible for teachers' pay and, therefore, for the implementation of this item from the May Decrees. Along with teachers' pay, constituent entities were to raise the salaries of physicians, nurses, and cultural and social workers, which resulted in a deficit of most regional budgets and had a negative impact on their economic growth.

The "battle" for teachers' pay pushed the main issue—that of improving the quality of schooling and raising the extent of families' satisfaction with school activity—into the background. Besides that, the issue of the long-term implications of a teachers' pay increase for the general education system—whether higher teachers' pay leads to a

Figure 1. **Average wage dynamics in the economy overall and that of teachers' pay in the Russian Federation from 2013 to the first quarter of 2017 (in roubles)**



sustainable development of general education institutions or, on the contrary, is fraught with their underperformance—has never been raised and, therefore, remained unaddressed [Klyachko 2015; 2016b].

Since 2013, the Centre for Economics of Lifelong Learning under the Russian Presidential Academy of National Economy and Public Administration has been conducting its School Performance Monitoring to find out the views of school directors, teachers and parents on various issues of school activity [Avraamova, Tokareva 2015; Avraamova et al. 2017]. An increasing share of positive opinions in each group of respondents testifies to improving school performance. However, the situation with their development sustainability is ambiguous. Even if the extent of the satisfaction of each of the above groups increases, it is not improbable that school development sustainability is decreasing.

The text below deals with changes in the viewpoints of teachers and students' parents and their attitude to the issue of a teacher pay increase as well as their assessment of the schooling quality.

The attitude of teachers to the issue of their pay increase, working conditions, and career prospects

The School Performance Monitoring shows that the extent of teachers' satisfaction with their pay has sharply decreased over the past few years (Fig. 2).

Figure 2. **Distribution of teachers' replies to the question, 'Are you basically satisfied with your pay?', %**

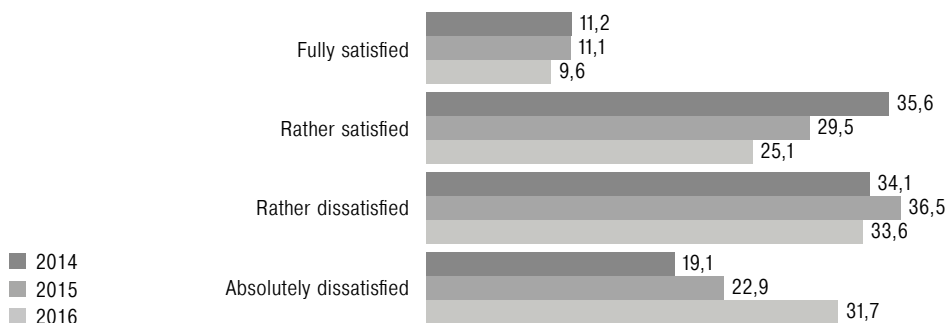
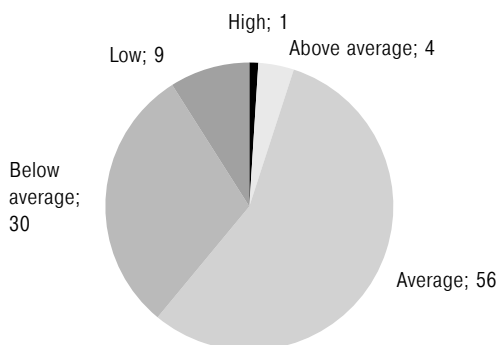


Figure 3. **Teachers' assessment of their financial standing, %**



In 2014, 46.8 per cent—almost half—of respondents were either “fully satisfied” or “rather satisfied” with their pay, while in 2016 this decreased to 34.7 per cent, i. e. slightly over one third of the total number of respondents. The share of negative replies, on the contrary, increased from 53.2 per cent in 2014 to 65.3 per cent in 2016.¹

So, in 2016, almost two thirds of teachers were dissatisfied with their pay. Furthermore, throughout the entire monitoring period, over 53 per cent of teachers noticed no increase in their pay, and only 4–6 per cent replied that it had increased considerably. It is quite another matter that in heavily subsidized regions there were more positive replies, while in the donor regions there were more negative ones.

At the same time, in 2016, 56 per cent of teachers assessed their financial standing as average, 30 per cent believed it to be below av-

¹ In 2013, teachers were not asked about it.

Table 1. Parents' opinions of changes in teachers' financial standing and social status, %

	2013	2014	2015	2016
What class do you think the majority of teachers belong to?				
To the well-off category	6.6	6.4	7.3	5.9
To the middle class	77.9	82.1	77.4	69.1
To the low-income category	15.5	11.5	15.3	25.0
In your opinion, has teacher pay been lately:				
Increasing significantly	10.0	10.1	7.1	5.9
Increasing insignificantly	46.3	38.7	31.9	22.6
Has not changed	18.6	22.3	21.7	16.3
Decreasing	1.5	1.3	6.3	14.6
At a loss	23.6	27.6	33.0	40.6

erage, and 9 per cent thought it low. As little as 1 per cent of teachers considered their financial standing high, and another 4 per cent ranked it above average (Fig. 3).

Self-assessments of teachers' financial standing varied depending on the type of populated area and region where they worked. The most negative assessments (below average and low) came from residents of two diametrically opposite types of populated areas: regional centres (44 per cent) and villages (40 per cent). Between four and six per cent of teachers in each type of populated area assessed their financial standing as above average or high.

Nevertheless, 61 per cent of teachers believe they belong to the middle class. However, a person's self-identification as a member of the middle class is only one indication of his/her membership in it [Tikhonova, Mareeva 2009]. Other important criteria are educational attainment, occupational status and the standard of well-being. As for educational attainment and occupational status [Niks 2014], teachers can be regarded as members of the middle class, yet the standard of their well-being most probably does not permit their inclusion into this population category, although their pay increase has changed the situation for the better.

Judging by the findings of the surveys undertaken in recent years, students' parents predominantly regard teachers as representatives of the middle class (with average incomes), which has a positive impact on their attitude to schools (Table 1). However, it is clear from the table that the rising trend in parents' assessments typical of 2013 and 2014, stalled in 2015, and then witnessed a significant increase in the share of opposing opinions in 2016.

Figure 4. **Extent of teachers' satisfaction with their teaching load, %**

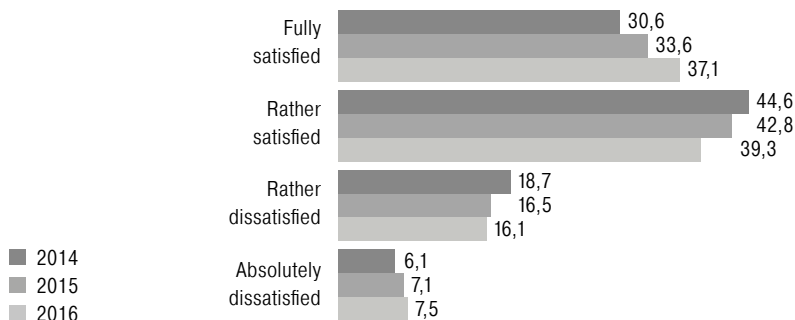


Table 2. **Teachers' opinions concerning factors attracting young professionals to schools** (several options were permissible), %

	2013	2014	2015	2016
What attracts young professionals to schools in your area? (mark all possible options)				
Work schedule	41.2	36.1	41.2	35.9
Relatively high salary	13.8	15.3	13.6	10.2
Relatively high social status	11.2	13.6	11.0	14.1
Interesting work	36.3	27.8	32.2	33.8
Absence of apprehension of losing one's job	28.9	30.0	31.7	36.5
Nothing attracts them	20.0	25.2	20.4	4.6
Other	—	—	—	23.9

Apprehensions as to a possible increase in the teaching load that teachers associated with their pay rise in 2013, no longer bothered them in 2014, although the share of teachers who found their teaching load “rather acceptable” dropped from 44.6 per cent in 2014 to 39.3 per cent in 2016 (Fig. 4).

At the same time, teachers believed that the main factor attracting young professionals to schools was their work schedule (Table 2). In 2016, this collected the highest percentage of replies—3.5 times higher than salary as a factor of their attraction (in 2014 the gap constituted 2.4 times). Therefore, a pay increase can hardly be expected to attract young professionals to schools in the medium term. Nevertheless, the issue requires additional study and evidence.

The majority of teachers interviewed believe that the intensity of their work is increasing (Table 3). Over 80 per cent of respondents

Figure 5. **Teachers' replies to the question 'Do you have to work at another place besides school?', %**

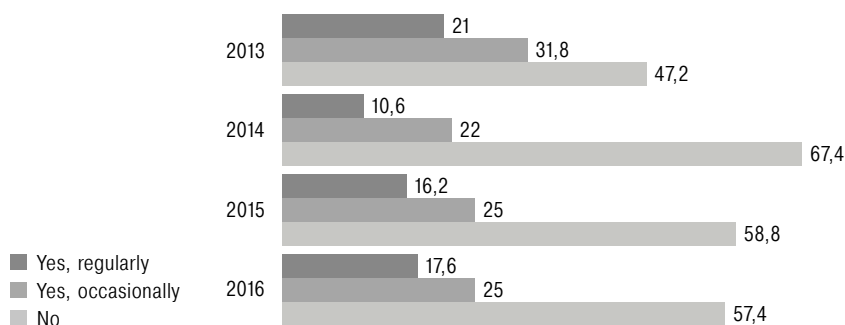


Table 3. **Teachers' opinions about changes in the intensity and content of their professional activity** (several options were permissible), %

	2013	2014	2015	2016
In recent years, work at school has become:				
Easier	1.7	2.0	1.5	2.3
More difficult	81.4	85.8	81.8	80.9
Has not changed	16.9	12.2	16.7	16.8
If it has become more difficult, why? (mark all possible options)				
More reporting and paperwork	83.0	78.8	84.5	80.7
Because of the introduction of the unified state exam (USE) & the final state attestation (FSA'9)	33.5	36.9	34.2	31.6
Due to the need to use computer technologies	17.9	13.6	12.8	10.1
Because it is more difficult to get along with students	19.8	14.7	14.9	11.8
Because it is more difficult to get along with students' parents	28.9	23.8	23.7	26.1
Other	—	—	—	3.4

consider an increasing bureaucratic load to be the main factor in the higher intensity and complexity of their work. It is increasing bureaucratization and formalization of their work —“an avalanche of paperwork”—that arouses the greatest discontent among teachers.

Simultaneously with the teachers' pay increase, an objective has been set to introduce value-for-money contracting, which implies that

Table 4. Teachers' extra jobs, apart from work at school (schools) by type of populated area (%)

Extra job, apart from work at school (schools)	Type of populated area				
	Administrative / regional centre	Major city	Town	Township	Village
Regular	20	15	14	14	9
Occasional	29	27	23	12	18
None	51	58	63	74	73

a teacher works at his/her school and nowhere else. The Monitoring has shown that the share of teachers who have only one job increased in 2014, but began to decrease in 2015, and the share of teachers who have another regular job (which is not always at school) has begun to increase (Fig. 5).

It is highly probable that in 2014, some teachers still had additional jobs, but began to conceal the fact, including from sociologists. However, another explanation is also possible: it was a period of adaptation to a new teaching load, and many teachers had to leave their jobs elsewhere. In 2015, the adaptation process was completed, and the number of additional jobs started to increase, especially since teachers' financial standing began to deteriorate (or teachers no longer were afraid of mentioning their regular jobs elsewhere). The indicators of teachers' additional employment vary considerably by type of populated area (Table 4).

On the one hand, in townships and villages, and even in towns, it is more difficult to find an additional job, to say nothing of major cities and regional centres. On the other hand, social control is considerably stronger in such populated areas. Nevertheless, in every type of populated area, teachers still have additional jobs, both occasional and regular.

Despite dissatisfaction with their pay levels and higher work intensity, the majority of teachers are not planning to leave the occupation (Table 5).

As is clear from Table 5, in 2016, over 40 per cent of teachers thought it possible to look for an additional job connected with education, and 34 per cent believed that an additional job could be outside the secondary education system. However, only about 6.5 per cent intended to change their field of activity and another 22 per cent did not reject the possibility, while the majority of teachers, almost 72 per cent, did not intend to abandon their work at school. In the period under review, the share of teachers who intended to retire in the near future increased. It is highly probable that this is explained by the ongoing ageing of the corps of teachers. Since, in teachers' opinion, a pay increase is not a significant factor capable of attracting young pro-

Table 5. Teachers' opinions about their work prospects (%)

	2013	2014	2015	2016
Are you planning to find an additional job in the field of education in the near future?				
Yes	–	8.4	8.5	9.1
Possibly	–	30.3	30.2	33.9
No	–	61.3	61.3	57.0
Are you planning to find an additional job outside the field of education?				
Yes	–	6.3	6.7	7.8
Possibly	–	24.0	20.0	26.2
No	–	69.7	73.3	66.0
Is it easy to find a decently paid job outside the secondary education system in your area?				
Easy	7.8	6.9	6.1	5.5
Not very easy	33.3	38.2	30.5	30.4
Difficult	40.0	36.2	39.5	37.4
Very difficult	18.9	18.7	23.9	26.7
Are you planning to change your field of activity (leave the secondary education system)?				
Yes	5.2	6.9	6.0	6.6
Possibly	24.3	21.4	19.7	21.7
No	70.5	71.7	74.3	71.7
Are you planning to retire in the near future?				
Yes	10.5	10.5	10.3	12.2
Possibly	20.3	16.0	12.3	15.4
No	69.2	73.5	77.4	72.4

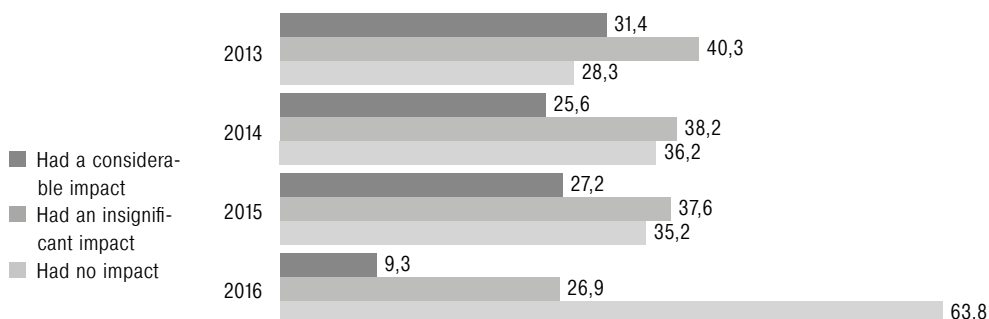
fessionals to schools, the retirement of older teachers may destabilize the situation in the medium term. However, the risk is not serious yet.

Extent of parents' satisfaction with school activity

The data obtained in the course of the School Performance Monitoring as to whether students' parents had expected higher education quality thanks to the teachers' pay increase, and whether their opinion had changed over the past years, make it possible to identify regularities in the formation of people's expectations concerning school development and the prospects of support for school reforms by students' parents (Fig. 6).

The replies parents' gave in 2013 to the question 'What was the impact of the teachers' pay increase on the quality of instruction at school?' can be interpreted as evidence of their hopes of better

Figure 6. **Parent's replies to the question 'What was the impact of the teachers' pay increase on the quality of instruction at school?', %**



schooling quality due to that increase. Judging by their replies to the same question in 2016, those hopes were frustrated, and the prevailing opinion was that the schooling quality had not improved. A sharp change of opinion occurred within one year. It may be assumed that its dynamics were influenced not only by the situation in secondary education but by overall changes in the Russian economy as well. Parents became aware that the increase in teachers' pay had ceased and, therefore, could no longer produce a positive effect on the quality of instruction, and decline was more likely to follow.

What is surprising is not so much the changes in parents' opinion about possible higher schooling quality due to a teachers' pay increase, but the fact that in 2013–2015, over a quarter of respondents were expecting such an improvement. The point is that in both 2013 and 2016, parents, as the Monitoring showed, were of the opinion that schools performed well and, therefore, it is not quite clear what kind of changes for the better this considerable proportion of the respondents expected.

The most important issue that schools, in parents' opinion, are supposed to address is to create enabling conditions for their children to acquire knowledge necessary for their future occupational activity. Over 85 per cent of respondents believe that schools are meeting this demand (Fig. 7).

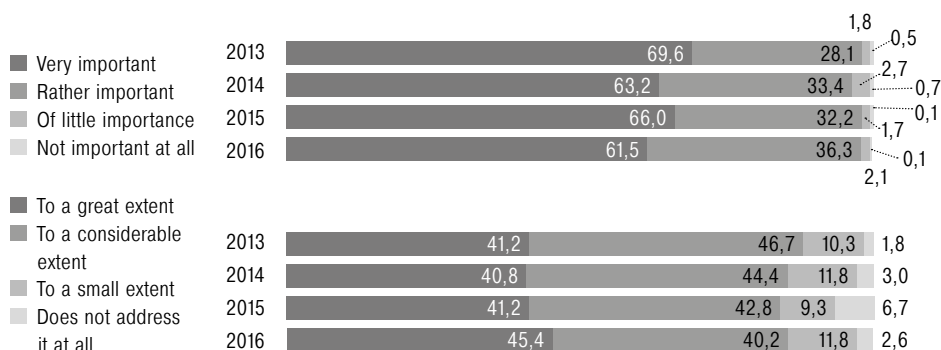
Parents are of the opinion that schools are also good at providing children with diverse knowledge, expanding their conceptions of the world so they can become educated and civilized persons (Fig. 8).

Moreover, in 2016, a considerable number of parents came to the conclusion that a teachers' pay increase had no impact on the quality of instruction, and the share of parents absolutely satisfied with the way schools provided knowledge to children making them educated and civilized persons even increased to 48 per cent (in 2013 there were 43 per cent of such parents). However, the share of parents who

Figure 7. Parents' replies to the questions 'How important is the issue of acquisition of knowledge required for the future occupation of your children to you?' and 'To what extent does the school your child attends address this issue?', %



Figure 8. Parents' replies to the questions 'How important is acquisition of diverse knowledge expanding your children's conceptions of the world and permitting them to become educated and civilized persons?' and 'To what extent does the school your child attends address this issue?', %

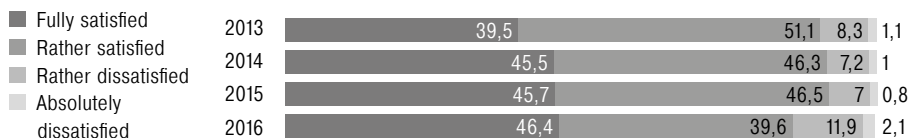


believed that schools addressed this issue "to a considerable extent" decreased from 51.8 per cent in 2013 to 42.3 per cent in 2016.

The Monitoring showed that practically all parents were sure that school teaches children to be disciplined, industrious and well-behaved in public. In 2016, 51.9 per cent of respondents were of the opinion that schools address this issue "to a great extent", and 37.5 per cent believed that it does so "to a considerable extent". The importance of these skills, in parents' opinion, was increasing. In 2013, 64.9 per cent of respondents considered them "very important" whereas in 2016 this increased to 70.6 per cent.

Thus, contrary to the prevailing opinion that general education is in a poor condition and the situation is deteriorating, the extent of par-

Figure 9. **Parents' replies to the question 'To what extent are you satisfied with the quality of instruction at schools?', %**



ents' satisfaction with school activity is high, constituting from 85 to 90 per cent. In view of the above, it would be strange if parents expected a higher quality of instruction due to a teachers' pay increase and, consequently, better outcomes of the secondary education of their children.

Why then do the general public believe that there is something wrong with secondary education if practically all parents are satisfied with the schooling quality?

When asked 'To what extent are you satisfied with the quality of instruction at schools?' parents gave lower assessments than to the questions concerning the way schools performed some of their functions (Fig. 9).

In 2016, only 46.4 per cent of parents were "fully satisfied" with the quality of their children's education, and 39.6 per cent were "rather satisfied". Although 86.0 per cent of respondents were generally satisfied with schooling (this indicator coincided with the extent of parents' satisfaction with the way schools performed some of their functions), the share of those dissatisfied increased to 14 per cent in 2016, whereas the earlier indicator stood at about 8 per cent. It is possibly dissatisfied persons, since they are active, who create negative perceptions regarding schooling. Besides that, the data of the Programme for International Student Assessment (PISA) show that general education in Russia lags behind its competitor countries. These findings arouse concern among the professional community, which believes that secondary education in Russia requires serious reform.

Conclusion Overall, a teachers' pay increase was welcomed by the general public and generated great expectations in Russia. At the same time, paradoxically, the majority of parents did not count on an improvement in the quality of instruction at schools. In other words, parents did not find any direct causal effect between the quality of schooling and a teachers' pay increase or decrease. In their opinion, schools performed their main functions well before the pay increase and continued to do so afterwards. However, in 2016, the share of parents' negative replies in the questionnaires of the School Performance

Monitoring began to increase, although over 85 per cent of parents assessed the school their child was attending highly.

It may be assumed that the most significant positive shift in the social status of teachers attributed to pay increase was a higher share of parents who defined teachers as middle class members. Such perception of the social status of teachers explained parents' greater trust in schools as institutions. Parents en masse are satisfied with school activity despite negative opinion about the quality of secondary education among the general public.

As for teachers, they are considerably more skeptical about their pay increase. In 2016, teachers' negative assessments of their salaries began to prevail substantially over the positive ones. Throughout the four years of Monitoring, the share of teachers dissatisfied with their pay was higher than the share of those satisfied. At the same time, more than half of the teachers consider their financial standing as average, although some of them—one in every eleven teachers—regard it as low. One can hardly expect that this category of teacher will exert any efforts to improve the quality of schooling.

Despite the increase in the number of negative assessments of the pay levels, most teachers do not intend to leave the occupation. Their dedication to school is not always explained solely by their love for the instruction process. The reason is often the limitations of local labour markets, making it rather difficult for teachers to find a decent job. It is this factor that makes the situation with schools in Russia sustainable for now, but the ageing of the corps of teachers is undermining its sustainability, albeit slowly.

References

- Abankina I. (2009) Issledovanie rezultatov i effektivov vvedeniya novoy sistemy oplaty truda uchiteley [Studying Results and Effects of a New Remuneration System for Teachers]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 4, pp. 153–169.
- Abankina I., Filatova L. (2015) Effektivny kontrakt: tendentsii izmeneniya motivatsii uchiteley [Effective Contract: The Trends in the Motivation of Teachers]. *Narodnoe obrazovanie*, no 7, pp. 98–104.
- Avraamova E., Tokareva G. (eds) (2015) *Obshchee obrazovanie: monitoring effektivnosti* [School Education: Monitoring of the Efficiency]. Moscow: RANEPa.
- Avraamova E., Klyachko T., Loginov D., Tokareva G. (2017) *Effektivnost shkolnogo obrazovaniya: pozitsiya uchiteley* [Efficiency of School Education: The Position of Teachers]. Moscow: RANEPa.
- Dolton P., Marcenaro-Gutierrez O., Still A. (2014) *The Efficiency Index. Which Education Systems Deliver the Best Value for Money? GEMS Education Solution*. Available at: <http://www.edefficiencyindex.com/book/files/assets/basic-html/index.html#page1> (accessed 10 November 2017).
- Gibbons S., McNally S., Viarengo M. (2011) *Does Additional Spending Help Urban Schools? An Evaluation Using Boundary Discontinuities*. Available at: <http://www.sole-jole.org/12058.pdf> (accessed 10 November 2017).
- Hanushek E. A. (2008) Education Production Functions. *The New Palgrave Dictionary of Economics* (eds S. N. Durlauf, L. E. Blume), Basingstoke: Palgrave Macmillan, pp. 200–238.

- Klyachko T. (2015) Zarabotnaya plata uchiteley—chto izmenilos za dva goda [Teachers' Salary—What Has Changed in Two Years]. *Narodnoe obrazovanie*, no 6, pp. 61–62.
- Klyachko T. (2016) Kak platit uchitelyam. Kommentariy k statye Gity Shtayner-Khamsi «Uchit, chtoby vyzhit: oplata truda po stavke i ee vozdeystvie na kachestvo prepodavaniya» [How Teachers Should Be Paid. Commentary to Gita Steiner-Khamsi's Manuscript "Teach or Perish: The Stavka System and its Impact on the Quality of Instruction References"]. *Voprosy obrazovaniya / Educational Studies*. Moscow, no 3, pp. 276–282.
- Klyachko T. (2016) Ekonomicheskie pokazateli effektivnosti shkoly: est li rezervy? [Economic Indicators of School Efficiency: Are There Reserves?]. *Zhurnal rukovoditelya upravleniya obrazovaniem*, no 3, pp. 1–14.
- Koombs F. H. (1970) *Krizis obrazovaniya v sovremennoy mire* [The World Crisis in Education]. Moscow: Progress.
- Niks N. (2014) *Sredniy klass v sovremennoy Rossii: desyat let spustya. Analiticheskiy doklad* [The Middle Class in Modern Russia: 10 Years Later. Analytical Report], Moscow: Institute of Sociology of the Russian Academy of Sciences.
- Tipenko N. (2014) Zarabotnaya plata v obshchem obrazovanii v 2013 g.: mezhrigionalnyy analiz, tendentsii i perspektivy [2013 Salaries in General Education: Cross-Regional Analysis, Trends and Outlooks]. *Voprosy obrazovaniya / Educational Studies* Moscow, no 4, pp. 148–168.
- Tipenko N. (2012) *Rost zarplat uchiteley mozhet ne uluchshit kachestva obrazovaniya*. Intervyu RIA Novosti, 28.03.2012 g. [A Teacher Pay Rise May Not Improve Education Quality. An Interview by RIA Novosti, 03/28/2012]. Available at: http://ria.ru/edu_analysis/20120328/607996937.html (accessed 10 November 2017).
- Tikhonova N., Mareeva S. (2009) *Sredniy klass: teoriya i realnost* [Middle Class: Theory and Reality], Moscow: Alfa-M.
- Steiner-Khamsi G. (2016) Uchit, chtoby vyzhit: oplata truda po stavke i ee vozdeystvie na kachestvo prepodavaniya [Teach or Perish: The Stavka System and its Impact on the Quality of Instruction References]. *Voprosy obrazovaniya / Educational Studies* Moscow, no 2, pp. 14–39.
- Schugal N., Ugolnova L. (2013) Effektivnyy kontrakt v obrazovanii. Po dannym statistiki i Monitoringa ekonomiki obrazovaniya ["Effective Contracts" in Education (Data from the Center for Statistics and Monitoring of Education)]. *Voprosy obrazovaniya / Educational Studies* Moscow, no 3, pp. 141–151.
- Uchitelskaya Gazeta (2016) *Kachestvo priyoma v pedagogicheskie vuzy sushchestvenno vyroslo*. Po materialam intervyyu Y. Kuzminova RIA Novosti [The Quality of Admission to Pedagogical Universities Has Significantly Increased. From an Interview of Y. Kuzminov to RIA Novosti]. Available at: <http://www.ug.ru/news/19503> (accessed 10 November 2017).

The Relationship Between Extracurricular Activities and Adolescents' Academic Performance and Self-Concept

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Abstract The paper explores the relation between involvement of school students in extracurricular activities and their self-concept in mathematics and humanities as well as physical self-concept. The study is based on a survey involving over 5,000 ninth-graders from schools in St. Petersburg, Leningrad Oblast and Pskov. Descriptive statistics and regression analysis methods reveal that involvement in extracurricular activities of any kind is positively related with academic performance, most strongly with educational achievements in foreign languages. We found no gender differences in the relationship between extracurricular activities and academic performance or self-concept; even sports have the same effects on the self-concept of boys and girls. Both structured and unstructured extracurricular activities are positively related with academic achievement, though the relation for unstructured activities is weaker. Engagement in two or three types structured extracurricular activities and in unstructured activities at the same time appears to be the most useful option in terms of academic achievement. Extracurricular activities also boost students' self-concept in relevant academic domains. The strength of relationship between extracurricular activities and academic performance depends on the size of the city, being more conspicuous in small cities and towns than in megalopolises.

Keywords extracurricular activities, academic performance, self-concept, self-esteem, concerted cultivation.

- References**
- Barber B. L., Stone M. R., Eccles J. S. (2010) Protect, Prepare, Support, and Engage. *Handbook of Research on Schools, Schooling, and Human Development* (eds J. L. Meece, J.S Eccles), New York, NY; Abingdon, Oxon: Routledge, pp. 366–378.
 - Bohnert A., Fredricks J., Randall E. (2010) Capturing Unique Dimensions of Youth Organized Activity Involvement Theoretical and Methodological Considerations. *Review of Educational Research*, vol. 80, no 4, pp. 576–610.
 - Covay E., Carbonaro W. (2010) After the Bell: Participation in Extracurricular Activities, Classroom Behavior, and Academic Achievement. *Sociology of Education*, vol. 83, no 1, pp. 20–45.

- Eccles J. S., Templeton J. (2002) Extracurricular and Other After-School Activities for Youth. *Review of Research in Education*, vol. 26, no 1, pp. 113–180.
- Eccles J. S., Roeser R. W. (2011) Schools as Developmental Contexts during Adolescence. *Journal of Research on Adolescence*, vol. 21, no 1, pp. 225–241.
- Feldman A. F., Matjasko J. L. (2007) Profiles and Portfolios of Adolescent School-Based Extracurricular Activity Participation. *Journal of Adolescence*, vol. 30, no 2, pp. 313–332.
- Gilman R., Meyers J., Perez L. (2004) Structured Extracurricular Activities among Adolescents: Findings and Implications for School Psychologists. *Psychology in the Schools*, vol. 41, no 1, pp. 31–41.
- Hansen D. M., Larson R. W., Dworkin J. B. (2003) What Adolescents Learn in Organized Youth Activities: A Survey of Self-Reported Developmental Experiences. *Journal of Research on Adolescence*, vol. 13, no 1, pp. 25–55.
- Ivaniushina V., Alexandrov D. (2014) Sotsializatsiya cherez neformalnoe obrazovanie: vneklassnaya deyatelnost rossiyskikh shkolnikov [Socialization Through Informal Education: Extracurricular Activities of Russian School Students]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 3, pp. 174–196.
- Ivaniushina V., Zapletina O. (2015) Participation in Extracurricular Activities and Development of Personal and Interpersonal Skills in Adolescents. *Journal of Siberian Federal University. Series: Humanities & Social Sciences*, vol. 8, no 11, pp. 2408–2420.
- Lareau A. (2003) *Unequal Childhoods: Class, Race, and Family Life*. Berkeley: University of California.
- Larson R., Hansen D., Walker K. (2005) Everybody's Gotta Give: Development of Initiative and Teamwork within a Youth Program. *Organized Activities as Contexts of Development: Extracurricular Activities, After-School and Community Programs* (eds J. L. Mahoney, R. W. Larson, J. S. Eccles), Mahwah, NJ: Lawrence Erlbaum Associates, pp. 159–183.
- Larson R. W., Brown J. R. (2007) Emotional Development in Adolescence: What Can Be Learned from a High School Theater Program. *Child Development*, vol. 78, no 4, pp. 1083–1099.
- Larson R. W., Hansen D. M., Moneta G. (2006) Differing Profiles of Developmental Experiences across Types of Organized Youth Activities. *Developmental Psychology*, vol. 42, no 5, pp. 849–863.
- Lipscomb S. (2007) Secondary School Extracurricular Involvement and Academic Achievement: A Fixed Effects Approach. *Economics of Education Review*, vol. 26, no 4, pp. 463–472.
- Mahatmya D., Lohman B. (2011) Predictors of Late Adolescent Delinquency: The Protective Role of After-School Activities in Low-Income Families. *Children and Youth Services Review*, vol. 33, no 7, pp. 1309–1317.
- Mahoney J. L., Stattin H. (2000) Leisure Activities and Adolescent Antisocial Behavior: The Role of Structure and Social Context. *Journal of Adolescence*, vol. 23, no 2, pp. 113–127.
- Mahoney J. L., Stattin H., Lord H. (2004) Unstructured Youth Recreation Centre Participation and Antisocial Behaviour Development: Selection Influences and the Moderating Role of Antisocial Peers. *International Journal of Behavioral Development*, vol. 28, no 6, pp. 553–560.
- Marsh H. W. (1990) The Structure of Academic Self-Concept: The Marsh/Shavelson Model. *Journal of Educational Psychology*, vol. 82, no 4, pp. 623–636.
- Marsh H. W. (1992) Extracurricular Activities: Beneficial Extension of the Traditional Curriculum or Subversion of Academic Goals? *Journal of Educational Psychology*, vol. 84, no 4, pp. 553.

- Marsh H. W., Martin A. J. (2011) Academic Self-Concept and Academic Achievement: Relations and Causal Ordering. *British Journal of Educational Psychology*, vol. 81, no 1, pp. 59–77.
- Valentine J. C., Cooper H., Bettencourt B. A., DuBois D.L. (2002) Out-of-School Activities and Academic Achievement: The Mediating Role of Self-Beliefs. *Educational Psychologist*, vol. 37, no 4, pp. 245–256.
- Youniss J., McLellan J. A., Su Y., Yates M. (1999) The Role of Community Service in Identity Development: Normative, Unconventional, and Deviant Orientation. *Journal of Adolescent Research*, vol. 14, no 2, pp. 248–261.

Achievement Indicators for Sustainable Development Goals in Education and National Education Policies

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Abstract The 2030 Agenda for Sustainable Development, or “action for people, planet and prosperity”, was adopted by the United Nations in 2015. An important role belongs to the education, which embraces ten targets. Currently, the international community coordinating by UNESCO is actively developing a set of indicators to reflect the level of the education goal and targets achievement. The article investigates the possibility of using a common set of indicators for countries with vastly differing socioeconomic conditions and levels of education system development and applying universal indicators to elaborate national education policies in different countries. Context analysis of the indicators of sustainable development goal and targets achievement, and differences in the interpretation of the indicators depending on specific country characteristics are analyzed.

Keywords sustainable development goals, education, indicators, socioeconomic context.

- References**
- Agranovich M. (2010) *Analiz rezultatov perepisi shkol i dannykh informatsionnoy sistemy upravleniya obrazovaniem* [The Analysis of the Results of the Census of Schools and of the Educational Management Statistics]. Dushanbe: Ministry of Education of the Republic of Tajikistan.
- Agranovich M. (2008) Indikatory v upravlenii obrazovaniem: chto pokazyvayut i kuda vedut? [Indicators in Education Management: What do they Indicate and Where do they Lead?]. *Voprosy obrazovaniya / Educational Studies Moscow*, no 1, pp. 120–145.
- Agranovich M. (2014) Metodicheskie voprosy sravnitelnoy otsenki subnatsionalnykh obrazovatelnykh sistem [Methodological Issues in Comparative Assessments of Sub-National Education Systems]. *Social Science Research Network*. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2457827 (accessed 10 November 2017).
- Agranovich M. (2012) *Rossiyskoe obrazovanie v kontekste mezhdunarodnykh indikatorov. Analiticheskiy doklad* [Russian Education in the Context of International Indicators: Analytical Report]. Saarbrücken: LAP LAMBERT Academic Publishing.
- Bagana J., Khapilina E. (2008) Frantsuzskiy yazyk v Afrike—inostranny yazyk? [Is French a Foreign Language in Africa?]. *Vestnik Rossiyskogo universiteta druzhby narodov. Ser. “Voprosy obrazovaniya: yazyki i spetsialnost”*, no 3, pp. 30–36.
- Beine M., Docquier F., Rapoport H. (2008) Brain Drain and Human Capital Formation in Developing Countries: Winners and Losers. *The Economic Journal*, vol. 118, iss. 528, pp. 631–652.
- Damon A., Glewwe P., Wisniewski S., Sun B. (2016) *Education in Developing Countries—What Policies and Programmes Affect Learning and Time in School? Rapport 2016:02, EBA*, Stockholm: Elanders Sverige AB.
- Dolton P., Oscar Marcenaro-Gutierrez O. (2009) *If You Pay Peanuts do You Get Monkeys? A Cross Country Comparison of Teacher Pay and Pupil Performance*. Paper presented at Final Conference of the RTN Network “Economic of Ed-

- ucation and Education Policy in Europe" (EEEEPE). Available at: http://cep.lse.ac.uk/conference_papers/13_03_2009/Dolton.pdf (accessed 10 November 2017).
- Firsing S. (2016) How Severe is Africa's Brain Drain? *Quartz Africa*. January 21.
- Hanushek E. A., Rivkin S. G. (2007) Pay, Working Conditions, and Teacher Quality. *The Future of Children*. vol. 17, no 1, pp. 69–86.
- Hanushek E. A., Woßmann L. (2007) *The Role of Education Quality in Economic Growth: World Bank Policy Research. Working Paper no 4122*, Washington, DC: World Bank.
- Krishnaratne S., White H., Carpenter E. (2013) *Quality Education for All Children? What Works in Education in Developing Countries. Working Paper 20*. New Delhi: International Initiative for Impact Evaluation (3ie).
- OECD (2017) *Education at a Glance 2017. Indicators*. Paris: OECD.
- OECD (2016a) *Education at a Glance. Skills Matter: Further Results from the Survey of Adult Skills, Skills Studies*. Paris: OECD.
- OECD (2016b) *PISA-2015. Results in Focus*. Paris: OECD. Available at: <http://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf> (accessed 10 November 2017).
- OECD (2014) Russian Federation—Country Note. *Education at a Glance 2014: Indicators*, Paris: OECD. Available at: <https://www.oecd.org/edu/Russian%20Federation-EAG2014-Country-Note.pdf> (accessed 10 November 2017).
- Rivkin S. G., Hanushek E. A., Kain J. F. (2005) Teachers, Schools, and Academic Achievement. *Econometrica*, vol. 73, no 2, pp. 417–458.
- Rozen Y. (2012) *Brain Drain and Brain Gain World Wide*. Available at: www.israel-braingain.org.il (accessed 10 November 2017).
- Sargl M. (2016) *The Effects of International Scholarships and Grants on High Skilled Migration in Kyrgyzstan and Kazakhstan: Is it a Brain Drain, a Brain Gain or a Brain Circulation?* München: Universität der Bundeswehr. Available at: https://www.unibw.de/bw/institute/unternehmensfuehrung/uf_professuren/sargl/sa_forschung/ (accessed 10 November 2017).
- Sawahel W. (2009) Algeria: Study Abroad Cuts to Tackle Brain Drain. *University World News*, iss. 28.
- Tipenko N. (2012) *Rost zarplat uchiteley mozhnet ne uluchshit kachestva obrazovaniya. Intervyu Novosti, 28.03.2012 g.* [A Teacher Pay Rise May Not Improve Education Quality. An Interview by RIA Novosti, 03/28/2012]. Available at: http://ria.ru/edu_analysis/20120328/607996937.html (accessed 10 November 2017).
- UNESCO, UNESCO Institute for Statistics, OECD (2003) *Financing Education—Investments and Returns. Analysis of the World educational indicators*. Available at: http://uis.unesco.org/sites/default/files/documents/financing-education-investments-and-returns-en_1.pdf (accessed 10 November 2017).
- UNESCO Institute for Statistics (2017a) *eAtlas for Education*. Available at: <http://tellmaps.com/sdg4/#!/tellmap/-1210327701> (accessed 10 November 2017).
- UNESCO Institute for Statistics (2017b) *Metadata for the Global and Thematic Indicators for the Follow-Up and Review of 4 and Education 2030*. Available at: http://uis.unesco.org/sites/default/files/documents/metadata-global-thematic-indicators-sdg4-education2030-2017-en_1.pdf (accessed 10 November 2017).
- UNESCO Institute for Statistics (2017c) *Sustainable Development Data Digest*. Available at: <http://uis.unesco.org/> (accessed 10 November 2017).
- United Nations (2015) *Transforming Our World: The 2030 Agenda for Sustainable Development*. Available at: <https://sustainabledevelopment.un.org/post2015/transformingourworld> (accessed 10 November 2017).
- World Education Forum (2015) *Inchkhonskaya deklaratsiya (Respublika Koreya, may 2015 g.)* [The Incheon Declaration (the Republic of Korea, May 2015)]. Available at: <http://unesdoc.unesco.org/images/0023/002331/233137r.pdf> (accessed 10 November 2017).