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THE MODERNIZATION OF EDUCATION IN KAZAKHSTAN: TRENDS, PERSPECTIVE AND PROBLEMS

Abstract. The purpose of current reforms in an education system – ensuring its high-quality transformation in the conditions of the market economy within globalization. Reforming of education demands creation of new legal, scientific and methodical, financial and material terms and adequate staffing for development of this process from the preservation of the positive potential which is saved up in this sphere. According to Nazarbayev «100 concrete steps» education should be one of the crucial areas of development. In particular, the President of Kazakhstan spoke about the improvement of the quality of the human capital from the standards of the countries of OECD. According to the large-scale international studies TIMSS and PISA, Kazakhstan students demonstrate high results at subject mastery level, but they are much less able to cope with tasks embedded in non-mathematical settings. The pupils own subject contents at quite a high level but cope with the tasks loaded with contextual information much worse. The use of a real-life context in school education could be a source of a wide range of opportunities both for deeper mastering of subject and for the developing cognitive skills. In a number of studies it has been shown that the use of a real-life context in education contributes to problem-solving skills, helps students apply gained in class knowledge to real-life everyday life and increases their motivation for learning.

Keywords: primary education, modernization, the real-life context, functional literacy, PISA, TIMMS.

Research Problem. The current trends in the education of the Republic cause the necessity of reconsideration of their role, functions and a place in the general education system, elaboration of new approaches in their further development.

The highly effective education system is one of the significant factors in providing a steady rise of the national economy and the Kazakhstan society. The purpose of the new economic and social reforms in an education system of our state – ensuring its high-quality transformation in the conditions of the market economy within globalization. Reforming of education demands creation of new legal, scientific and methodical, financial and material requirements and adequate staffing for deepening and development of this process from the preservation of the positive potential which is saved up in this sphere.

It is possible to carry out a qualitative education reform in the conditions of dynamic social and economic changes in society only in the presence of detailed worked strategy considering as the real situation which developed in education, the accruing tendencies, and the operating relations, and possible ways of future development of society and state.

Development of the program is dictated by the need for changes in the organizational and economic, substantial and methodical, legal and social and psychological relations which developed in education. It along with the existing state and departmental programs in education and its new standard and legislative providing will make an organizational basis of realization of public policy in education.

In the President's book of Nursultan Nazarbayev to the people of Kazakhstan "Kazakhstan way-2050: The uniform purpose, uniform interests, the uniform future" it is paid particular attention to education improvement of quality. The modernization of education is one of the steps which Kazakhstan has to pass on his way to enter into number 30 of the most developed countries of the world.

In the conditions of modern dynamic development and the global competition from education, it is required that it was qualitative and continuous throughout all life. Therefore the task of mastering modern techniques and programs of training, an increase of the level of teaching, training in demanded knowledge and skills, such as three - language policy, (Kazakh, Russian, English), professional preparation, analytical thinking is set for the Kazakhstan education system. We should carry out high-quality reforming of all system of knowledge acquisition which result has to be an exit to the international standards of education. Introduction at all levels of training of the principle of duality that will promote fixing at young people not only theoretical knowledge but also practical skills and abilities of work on the production, including hi-tech and innovative character is necessary.

"Modernization of an education system in Kazakhstan is expedient on three main directions: optimization of educational institutions; modernization of teaching and educational process; increase of efficiency and availability of educational services", – social modernization of Kazakhstan is told in article of the President of the Republic of Kazakhstan Nursultan Abishevich Nazarbayev ": The twenty steps to society of general work", published in official mass media.

According to President Nazarbayev, within optimization, it is necessary to strengthen a continuous vertical of education. It is crucial to restoring logical interrelation of all types of "age" education as full elevator: preschool, initial, average, professional, the highest and post-high school.

Thus Nursultan Abishevich Nazarbayev emphasized that it is impossible to allow essential gaps as the educational services provided by private and public institutions of education. The education system has to remain nationwide.

He noted that, first, it is necessary to take measures for improvement of the quality of the management case in the system of secondary education. Secondly, it is essential to adjust control of observance of the state educational standards at private schools, colleges, and higher education institutions, including the international.

The state program of development of the Republic of Kazakhstan for 2011-2020 is a new round of increase of competitiveness of education, construction of the human capital by ensuring availability of quality education to a steady rise of the economy.

One of the strategically essential directions of modernization of the Kazakhstan education is a transition to the 12-year model of training. The Ministry of Education revises the state general education standard of 12 years' education and develops training programs, textbooks for the 9th experimental classes within the transition to 12 years' training.

Urgent question on the agenda, there is a development and examining textbooks. Expertize of 831 books and EMB is carried out, from them it is recommended to use in educational process 756. Now the experimental integrated training programs in 15 subjects are developed. The Ministry of Education and Science of Kazakhstan together with International Bank for Reconstruction and Development realizes the project on modernization of system of technical and professional education (further – TPE) according to inquiries of society and industrial and innovative development of the economy, integration into world educational space.

Nursultan Nazarbayev charged to enter stage-by-stage introduction of 12 years' education, updating of standards of school training for the development of functional literacy, and also the introduction of per capita financing in high school and creation of the system of stimulation of successful schools.

According to the State programme of education and science development in 2016-2019, the transition to 12 years' education is the main priority. The full process will take four stages: since 2016 of the first classes; since 2017 – the second, fifth and seventh classes; since 2018 – the third, sixth, eighth and 10th classes; since 2019 – the fourth, ninth, 11th and 12th classes. In 2015 the necessary state standard of education (SOSE) of elementary school was approved.

Since September 1 approbation of GOSO of primary education, textbooks and the educational and methodical complex (EMC) in the first classes of 30 pilot schools of the Republic of Kazakhstan began. Since September 1, 2016, the first classes overall country passed to training according to the program of the 12-year school.

Thus, the transition to the updated content of education began. From the first class entered the new subject "Natural sciences" (fundamentals of natural sciences) and from the third class – "Information and communication technologies." It should be noted that since the same year the first classes of schools

started studying five days in a week. Scientists already scientifically proved that at the reduction of the duration of educational week productivity of training increases. GOSO from secondary, general secondary education is provided by the introduction of 12 years' teaching and a three-language policy.

Trilingual training in Kazakhstan will be entered in 2018 and only within the senior classes. It is meant just in the 10-11th courses in studying subjects which pupils will choose.

The use of a real-life context in school education could be a source of a wide range of opportunities both for deeper mastering of subject and for the developing cognitive skills. In a number of studies it has been shown that the use of a real-life context in education contributes to problem solving skills, helps students apply gained in class knowledge to real-life everyday life and increases their motivation for learning [Cognition and Technology ..., 1990; Boaler, 1993; Brenner, 1998; Chapman, 2006; Freudenthal, 1973; Gravemeijer, 1994; Pilot, Bulte, 2006].

According to Nazarbayev "100 concrete steps" education should be one of the crucial areas of development. In particular, the President of Kazakhstan spoke about the improvement of the quality of the human capital from the standards of the countries of OECD.

According to the large-scale international studies TIMSS and PISA, Kazakhstan students demonstrate high results at subject mastery level, but they are much less able to cope with tasks embedded in non-mathematical settings. These results seem to be true both for mathematics and science. To solve PISA tasks formulated in the context of everyday life, it is necessary to have the modeling skills - that is, to be able to build a mathematical model of the proposed daily situation [PISA 2012 Assessment…, 2013]. Thus, relatively lower students' results in PISA compare to student's results in TIMSS may indicate, that students in Russia experience difficulties to apply gained in school knowledge in a real-life context.

Such the gap in the students' TIMSS and PISA results in Kazakhstan could be explained with the fact how education is organized in Kazakhstan [Bolotov et al., 2012; Kasprzhak and others, 2005]. That is, it was shown that teacher get insufficient methodological support for the use of real-life context in his subjects at school [Egurova, 2014; Tyumeneva et al., 2015].

It is important to note that the problem identified on the TIMSS and PISA data is relevant for several school disciplines such as chemistry, biology, physics and mathematics.

Government standard for education in primary and secondary school emphasizes the growth of "a value of mathematics and computer science in the daily life of a person". That is, a person should be able "to model real-life situations in the language of algebra, to study the constructed models by using the algebra conceptions, to interpret the obtained results" and "to apply the concepts, results, methods for solving practical problems and problems from related disciplines". The necessity to develop the abilities of students to use school knowledge in everyday life is emphasized in the "Fundamental core of the content of general education" as well.

Literature Review. The variety of teaching practices towards real-life context, word problems and related to them effects for the students' achievements are widely studied in the literature. The most widely these questions are considered within the framework of the theory of situational learning [Lave, 1988; Lave & Wenger, 1991; Greeno, Smith, & Moore, 1992], as well as in the context of the transfer of knowledge [Lehman, Nisbett, 1990; Gick and Holyoak, 1980; Bransford et al., 1999]. As Russian literature concerns, learning in context is mainly considered within the framework of vocational education and higher education [Verbitsky, 1991]. Recently, issues of the learning in a context is discussing within a competence-based approach to education [Verbitsky, 2016]. A large number of works have been devoted specifically to the use of real-life context in math education: V.V. Firsova, I.M. Shapiro, M.V. Egupova, J. Boaler, L. Verchaffel, E. De Corte, as well as dissertations, for example, L.E. Haimina, V.P. Kizilova, N.V. Reshetnikova.

Following aspects of using a real-life context in education are studied: teaching practices [Greeno et al., 1997; Lange, 1996; Boaler, 1993; Chapman, 2006] and teachers' beliefs [Meirink et al., 2009; Thompson, 1992; Stipek et al., 2001]. However, a little attention has been paid to a connection between the way of working with a problems' context and a content of problem. Next, teachers' beliefs about the possibility to use a real-life context in education in Kazakhstan have not been explored yet. Finally, the use of a real-life context in math education in Kazakhstan has not been considered from an international perspective. Thus, the small numbers of empirical studies devoted to these questions inspired the decision to explore this topic.

Primary education (Grades 1 to 4) – This level is provided in primary schools, lower secondary schools that include the primary level, and secondary schools that include all three levels of education. The goals of primary education are the following: form children's personalities; develop their individual abilities; instill a positive attitude toward education; develop strong literacy, numeracy, and language skills; encourage self-realization; and teach behaviors that will help children master subsequent education programs in basic secondary school.

In order to monitor student performance in general educational programs, education organizations conduct ongoing and interim assessments. Education organizations independently determine the method, order, and frequency of assessments. Ongoing assessment of student performance is conducted by teachers in all school subjects. Interim assessments are administered after the completion of the school year and before May 31. Education organizations set a list of subjects in accordance with their own education programs and curricula, which are based on the State Mandatory Standards for General Secondary Education.

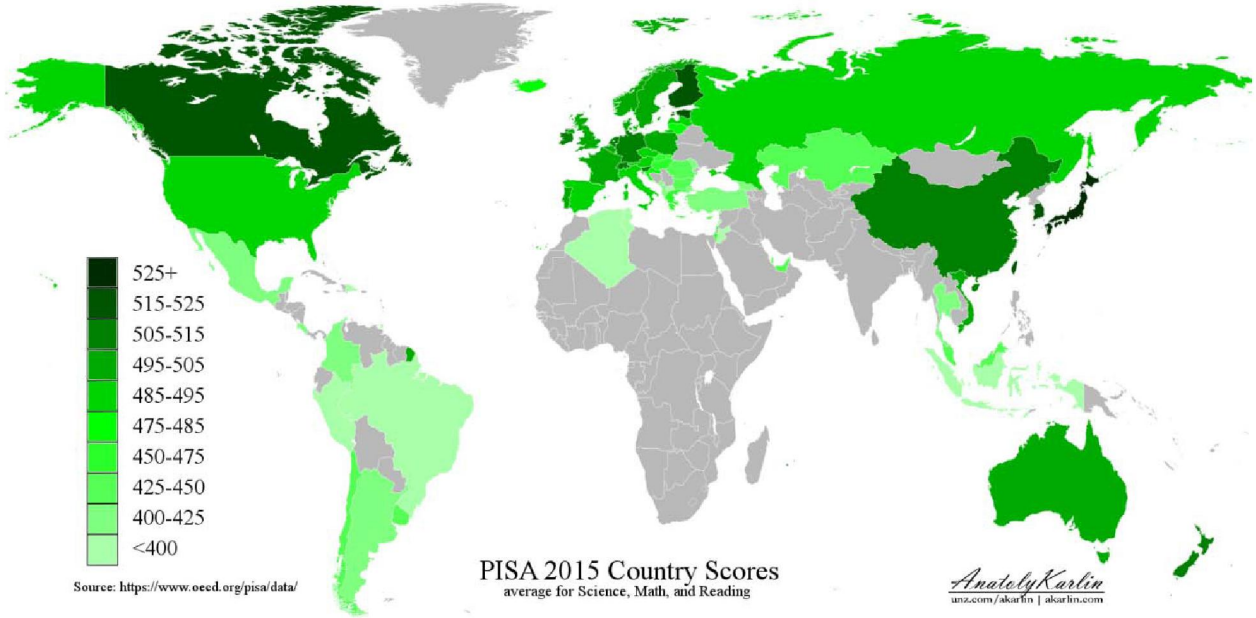
Objectives of the Research.

The aim of the dissertation was to analyze the use of real-life context in teaching at primary and secondary school level in Kazakhstan and to consider the results from an international perspective of using real-life context at school.

The mixed-method design was chosen to conduct that research.

In order to answer the *first group of research questions*, there were employed datasets of two large-scale assessment TIMSS and PISA, and one panel from a longitudinal survey TrEC.

Main results. In order to answer *the first group of research questions* the datasets of TIMSS 2016, PISA 2015 and TrEC were analyzed. First, according to TIMSS 2016 data, it was shown that mathematics teachers in Russia and in foreign countries devote a comparable amount of time to many math teaching practices, including working with real-life context. However, in Russia, students at the 8th grades are much less likely to meet a task that requires more independent problem-solving activity (solving complex and unfamiliar problems that do not have an obvious method of solution) compare to peers in other countries. And, at the same time, they are much more likely to perform tasks on reproductive activity (apply facts, concepts, and procedures to solve routine problems). As for math test, Russian students more often need to solve problems on memorizing rules, procedures, and facts than their peers in foreign countries. It is important to note, that the real-life word problems tasks were presented in math tests in Russia with the same frequency as in foreign countries. Thus, in many cases, teachers in Russia use real-life context in teaching mathematics to the same extent as teachers in other countries.



The result of PISA 2015

However, the results of the international study of PISA 2015 revealed quite opposite results: students in CIS are more familiar with the tasks and concepts that can be attributed to formal mathematics, rather than to applied mathematics. For example, the 9th students in CIS noted that they more often work in math lessons with concepts from algebra (quadratic and exponential functions) and geometry (vectors, polygons), solve equations, than with real-life word problems. Compare to other countries the frequency of formal math problems is one the highest among them.

The Organization for Economic Cooperation and Development has released the influential PISA rankings based on tests taken by 15-year-olds in more than 70 countries, including Kazakhstan. In total over 500,000 15-year-olds took part in the PISA 2015. Kazakhstan was represented by 5,780 15-year-old schoolchildren and students from 16 regions of the country (189 schools and 27 colleges). The OECD rankings doesn't rank countries by points, instead, it highlights the high-achieving education systems. Compared to the 2012 results, Kazakhstani students demonstrated progress in maths (28 points), reading (34 points) and science (31 points). It became possible after Kazakhstan launched the National Action Plan on the development of functional literacy of schoolchildren on instruction of Head of State Nursultan Nazarbayev and took steps to update the content of secondary education. The Program for International Student Assessment (PISA) provides education rankings on the basis of international tests taken by 15-year-olds in maths, reading and science. The tests are taken every three years. It should be noted that Asian countries have been dominating the rankings for the past couple of years with Singapore at the top.

Results of TIMMS survey 2016

#	Country	Math	Reading	Science	Mean	"IQ"
1	Singapore	564	535	556	551.7	107.8
2	Hong Kong (China)	548	527	523	532.7	104.9
3	Japan	532	516	538	528.7	104.3
4	Macao (China)	544	509	529	527.3	104.1
5	Estonia	520	519	534	524.3	103.7
6	Canada	516	527	528	523.7	103.6
7	Chinese Taipei	542	497	532	523.7	103.6
8	Finland	511	526	531	522.7	103.4
9	Korea	524	517	516	519.0	102.9
10	B-S-J-G (China)	531	494	518	514.3	102.2
13	Germany	506	509	509	508.0	101.2
21	Australia	494	503	510	502.3	100.4
22	Viet Nam	495	487	525	502.3	100.4
23	United Kingdom	492	498	509	499.7	100.0
28	Russia	494	495	487	492.0	98.8
31	United States	470	497	496	487.7	98.2
32	Latvia	482	488	490	486.7	98.0
44	Kazakhstan	460	427	456	447.7	92.2
52	Turkey	420	428	425	424.3	88.7
63	Georgia	404	401	411	405.3	85.8
73	Dominican Republic	328	358	332	339.3	75.9
	OECD Average	**490**	**493**	**493**	**492.0**	**98.8**

The latest Timss makes better reading for Russia which moved from 10th up to 7th in the primary maths table, stayed at 6th in secondary maths, climbed from 5th to 4th in primary science and stayed at 7th for secondary science. Kazakhstan also shot up the tables – from 27th to 12th place in primary maths, 17th to 7th in secondary maths, 32nd to 8th in primary science and 20th to 9th in secondary science.

Nowadays Kazakhstan faces a formation of the new education system which focused on world educational practice. This process is initiated by necessary changes in the pedagogical theory and practice of teaching and educational process. The teacher jobs require new skill as the ability to find a right pedagogical method in a wide range of modern, innovative approaches and create a valuable training material of the new generation. This aspiration of reaching all students spans disciplines, age levels, and all varieties of institutions. Most teachers do so out of a genuine love for their subject and a desire to share the wonder of their chosen field with others. Science teaching is no different than other disciplines in this respect. However, try as we may in science, the lack of diversity apparent in the statistics of who chooses to pursue scientific disciplines professionally suggests that we still have much to learn about how to reach all students.

In the last 20 years, international surveys assessing learning in reading, mathematics, and science have been headline news because they put countries in rank order according to performance. The three most popular reviews are TIMSS, PISA, and PIRLS. The main difference between TIMSS and PISA is the type of sample and focus of research. Pupils of the 4th and 8th classes take part in TIMSS. Only 15-year-old pupils of schools (7-12 grades) and colleges participate in PISA. TIMSS measures the academic knowledge (What? Where? When?), 80% of the TIMSS tasks are directed to the reproduction of culture. PISA measures functional competences - the ability to effectively apply knowledge in various life situations, to logically think and draw valid conclusions (Why? What for? As?) to interpret information schedules and charts, etc. Our teenagers know the school program in biology, but don't understand what GMO is. They are not wrong in calculations but have problems with statistics... Recently was published results of PISA-2015, the sample is more than 400 thousand teenagers from 57 countries. The rating of Kazakhstan is only in the fourth ten. Monitoring of quality of education at PISA school is carried out in four main directions: literacy of reading, mathematical literacy, natural-science literacy and computer literacy. The PISA monitoring allows revealing and comparing the changes in education systems in the different countries and estimating the efficiency of strategic education decisions. Analyzing our failures in the PISA tasks, scientists have selected the long list of "deficiencies" – those skills which aren't enough for school students for the successful solution of functions.

PISA (Programme for International Student Assessment) - an assessment of mathematical, natural-science and reader's literacy of 15-year-old students. The research is conducted by OECD 3-year cycles since 2000. Kazakhstan has experience of participation in two PISA-2009 and PISA-2012 projects.

In comparison with PISA-2009 Kazakhstan has improved results in the direction of mathematical and natural-science functional competence of school students. The growth of an indicator of effectiveness on mathematical literacy has made 27 points (2009 - 405, 2012 - 432 points) and 25 points on natural sciences (2009 - 400, 2012 - 425 points).

Will present 8 261 15-year-old students of 232 organizations of secondary education including from 16 NIS to PISA-2015 Kazakhstan.

TIMSS (Trends in International Mathematics and Science Study) - an assessment of the quality of mathematical and natural-science education of pupils of the 4th and 8th classes. It is carried out by 4-year cycles since 1995.

In TIMSS-2011 the GPA of the Kazakhstan fourth-graders in the direction mathematical literacy has made 501 and 495 - natural-science competence (on 1000 mark system). Eighth-graders on mathematics have gathered - 487, on natural sciences - 490 points.

The total number of students from Kazakhstan (179 schools) who took part in TIMSS-2015 (the 4th classes – 4 852 people, the 8th classes – 5 038 people).

For the first time, Kazakhstan took part in the TIMSS study in 2007. As a result, Kazakh fourth-graders took fifth place out of 36 countries in mathematical literacy and the 11th place in sciences.

The study is aimed at identifying students' capacities to apply knowledge and skills in different situations for an adequate socialisation. Nowadays, modern parents are trying to pay more attention to children and unveil their skills in various directions realising that rapidly developing world generates more challenges for younger people.

According to Assan Zholdassov, head of Pythagoras School, engaged in training competitive students in science, technology, mathematics and engineering, students tend to choose careers in technical areas. "At present, great number of children show interest in mathematics and exact sciences. Students like to

compete; they are fond of solving mathematical tasks. Parents also make a great contribution to children's study," said Zholdassov in an interview to the Astana Times.

The OECD doesn't range the country on the gained points. The main reason for this assessment is to show the progress of educational systems all around the world. In comparison with PISA-2012, the Kazakhstan participants of the international test have shown improvement in all directions of research. Growth in mathematics has made 28 points and to natural sciences - 31 points. The trend of the progress of mathematical and natural-science competences remains at the high level. In 2012 growth in comparison with 2009 made 27 and 25 points respectively. Our 15-year-old students showed the highest rate of a gain of points in PISA-2015 on reader's literacy (+34). It has become possible thanks to the "National plan of action for the development of functional literacy of school students" realized at the request of the Head of state and actions for the transition to the updated maintenance of school education. Thus, target indicators of the state program of development of knowledge and science, the strategic plan of the Ministry of Education and Science for 2014-2018 where expected values have been provided in 440 points on mathematics (fact 460), 430 on natural sciences (456), 400 on reader's literacy (427) are reached.

Besides, all 15-year-old school students of Nazarbayev Intellectual Schools (2 061 people) for the first time have taken part in the PISA-2015 project. Their influence on the general results of Kazakhstan has been corrected in proportion to a share of pupils of NIS from the total number of pupils of the republic [9].

Nazarbayev Intellectual Schools (NIS) are an initiative of the government of Kazakhstan intended to educate the future intellectual leaders of the country. This network of elementary and secondary schools teaches students in a trilingual environment of Kazakh, Russian, and English.

NIS accepts talented, motivated students, with the aim of developing them into critical thinkers and independent learners. NIS schools are located throughout Kazakhstan, with new campuses opening due to rapid expansion throughout 2014 and 2015. As a result, NIS is recruiting experienced teachers for the opportunity to become part of their educational initiative.

Their influence on the general results of Kazakhstan has been corrected in proportion to a share of pupils of NIS from the total number of pupils of the republic. The NIS students showed excellent results in mathematics, and natural sciences competitions (Singapore, Hong Kong, Macau, the Chinese Taipei, Japan, etc.). Participants from Nazarbayev of intellectual schools gained 523 scores on math, natural sciences - 517 and in reading 492 scores. The Results of Kazakhstan in PISA-2015 raised serious questions. The full and in-depth analysis with concrete conclusions and recommendations was published in the National report. 70% of the questions PISA estimate abilities to apply knowledge. Earlier it was reported that the Kazakhstan pupils of 4 classes took the seventh place on mathematics and the eighth place on natural sciences in TIMSS. Pupils of 57 countries have entered the international monitoring research of quality of school mathematical and natural-science education of TIMSS (Trends in Mathematics and Science Study).

We interviewed foreign teachers working in NIS. Most of them were really happy to work with kids, "brilliant", "gifted". More than 50% of teachers complaints about stress at work, bad management, and bad cooperation between administration and teachers.

International comparative studies have played a key role in the modernization of Kazakhstan's education system. Kazakhstan's participation in international studies is stipulated in the State Program for Educational Development and is funded by the national budget. The significance of the country's participation in these studies is invaluable. It not only allows the country to obtain objective data, but gives a realistic assessment of the achievements and problems of education in the country.

TIMSS results have informed the review of natural science and mathematics curricula, teaching methods in mathematics and natural science, and university- and college-based teacher education programs in Kazakhstan. For example, the TIMSS conceptual model was used in the development of educational programs and textbooks by the National Academy of Education Named After Y. Altynsarin. The JSC National Center for Professional Development "Orleu" developed special programs to support teaching staff in implementing international assessments that evaluate student achievement.

National experts have undertaken in-depth analyses of TIMSS nonconfidential test items. Two-stage assessments of student educational achievement were conducted in 2012–2014, taking into account

TIMSS technologies. The same sample of schoolchildren (Grades 5 to 6 and Grades 8 to 9) participated in the study both times. Parents also participated in the national study.

What are the benefits of international surveys? Governments need to know what is going on in the systems for which they are responsible. Leaders have to decide where to allocate resources according to greatest need. International surveys could help them to make better decisions based on more transparent data. The announcement of performances has had a significant impact on national discussions about education systems and policies. Schools and teachers can reflect on a survey's global analysis and consider recommendations for good practice. The studies obtain supplementary information through questionnaires and correlate this with the test results. For example, PISA 2012 states that lack of punctuality and truancy are negatively associated with test performance, and makes recommendations regarding learner engagement. National research and professional development programmers often use the data from the international surveys as a starting point.

There is, however, a significant distinction in what the two tests purport to measure: the TIMSS is focused on formal mathematical knowledge, whereas the PISA emphasizes the application of mathematics in the real world, what they term "mathematics literacy." As a consequence, it would not be surprising to find significant differences in how students perform, given that some countries' teachers might concentrate on formal mathematics and others' on applied mathematics.

But the real surprise is that these differences may not matter quite as much as we might suspect. For the first time, the most recent PISA test included questions asking students what sorts of mathematics they had been exposed to, whether formal mathematics, applied mathematics, or word problems. After analyzing the new PISA data, we discovered that the most significant predictor of how well a student did on the PISA test was exposure to formal mathematics. That fact is a notable finding, to be sure since the PISA is designed to assess skill in applied rather than formal math. Exposure to applied mathematics has a weaker relationship to mathematics literacy, one with diminishing marginal returns. After a certain point, more work in applying math is related to lower levels of mathematics literacy.

Why these unexpected results? One reason might be that students need to be very comfortable with a mathematical concept before they can apply it in any meaningful way. One cannot calculate what percentage of one's income is going to housing without a clear understanding of how proportions work. It appears that a thorough grounding in formal mathematical concepts is a prerequisite both to knowledge and to using mathematics.

The analysis of the teachers' approaches towards real-life context in lesson showed, that in most cases teachers avoided the elaborating the context of the problem (narrative approach) and paid more attention to the overall structure of the problem, its type and the use of the known method of solutions (paradigmatic approach). In general, teaching interventions towards word problems of Russian teachers are corresponded to teaching practices in other countries. In addition, math teachers both in CIS (Russia) and other countries are more focused on the modeling phase of problem solving than on the interpretation phase. However, unlike foreign colleagues, Russian teachers do not pay attention to distinguishing relevant and irrelevant information in word problem.

Finally, the interventions towards word problems varied significantly by the type of the word problem. If the word problem' context was significant to a student life and had non-routine formulation, then the teachers were more likely to elaborate the real-life context of that problems. Conversely, if the word problem had to be solved just with modeling the situation, then math teachers devoted more time to the structure of such a problem. Thus, the methods used by teachers towards word problems are related to the characteristics of the word problem.

Next results were obtained answering to the third group of research questions. First, based on the analysis of math teachers interviews, it was shown that a significant part of teachers does not consider the role of real-life context as meaningful and self-contained in teaching mathematics. Although teachers in CIS and in other countries devote almost an equal amount of time to real-life context in teaching math, mostly Russian teachers use word problems in order to support teaching of the theoretical material or even as an entertainment. Math teachers in other countries also consider word problems as an additional source of increasing students' motivation, but, in comparison with Russian teachers, they do not distinguish this type of activity as secondary to the mastery of the theoretical material.

Secondly, in math teachers' opinions, an additional difficulty of using real-life context math lessons is the lack of a sufficient number of appropriate word problems. In result, teachers have to spend large resources for searching for these tasks or to develop them. Moreover, together with additional time costs for searching word problems, teaching interventions of real-life context is quite time-consuming, in teachers' opinions. Similar difficulties are experienced by math teachers in other countries, which also indicate a great time cost of using the real-life context in math lessons. Finally, math teachers both in Russia and other countries noted the lack of professional training for the work with the real-life context in teaching mathematics.

In general, this study allowed us to consider the use of real-life context in teaching mathematics from several points of view, as well as from an international perspective. The conducted analysis and comparison of teaching methods on datasets of TIMSS 2011, PISA 2012 and TrEC have shown us significant differences in the frequency of using tasks with low and high cognitive loads. Further, the analysis of the teachers' approaches towards word problems has demonstrated that math teachers both in Kazakhstan and other countries similarly work with the real-life context of word problems. And an analysis of teachers' beliefs has revealed similar attitudes of math teachers both in CIS and abroad to the use of real-life context in teaching mathematics. Thus, the use of real-life context in math lesson is rather similarly organized in Kazakhstan and in other countries.

It is important to note, that the real-life context plays a secondary and supportive role in teaching subject in school, according to the results of the study. First, due to the teachers' approaches towards word problems, the teacher implicitly signals to students what is relevant to learning math in school. By skipping elaborating the problemcontext, a teacher indirectly shows these interventions should not be paid attention to and that learning in school has nothing to do with real-life context. Secondly, the secondary role of real-life context was shown by the using of those word problems which often were not a correct model of the real-life. Finally, in teachers' beliefs, the real-life context also plays only a supporting role in the math learning process.

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ҚАЗАҚСТАНДАҒЫ БІЛІМ БЕРУ ЖҮЙЕСІНІҢ ЖАҢАРУЫ: ДАМУ БОЛАШАҒЫ МЕН МӘСЕЛЕЛЕР

Аннотация. Республиканың білім беру саласындағы қазіргі заманғы үрдістері және оның әртүрлі деңгейдегі міндеттері жалпы білім беру жүйесіндегі өздерінің рөлін, функцияларын және орнын түсінуді, оларды одан әрі дамытудың жаңа тәсілдерін әзірлеуді қажет етеді. Тиімділігі жоғары білім беру жүйесі – ел экономикасының және қазақстандық қоғамның тұрақты өсуін қамтамасыз ететін негізгі факторлардың бірі. Біздің мемлекетіміздің білім беру жүйесінде жүргізіліп жатқан реформалардың мақсаты жаһанануды ескере

отырып, оның нарықтық экономика шарттарында сапалы өзгеруін қамтамасыз ету болып табылады. Білім беруді реформалау осы салада жинақталған оң әлеуетті сақтау негізінде осы процесті тереңдету және дамыту үшін жаңа құқықтық, ғылыми, әдістемелік, қаржылық және материалдық жағдайларды жасауды және тиісті штаттық қамтамасыз етуді талап етеді. Мемлекет басшысы Н.Ә.Назарбаевтың «100 нақты қадамдар» жоспарында білім беруге көп көңіл бөлінген. Атап айтқанда, Қазақстан Президенті ЭЫДҰ елдерінің стандарттарына (PISA, TIMMS) негізделген адами капиталдың сапасын арттыру туралы айтты. 2016 жылдың 1 қыркүйегінен бастап бүкіл ел бойынша алғашқы сыныптар 12 жылдық оқу бағдарламасына ауыстырылды. Осылайша, білім берудің жаңартылған мазмұнына көшу басталды. Бірінші сыныптан бастап «Табиғаттану» (жаратылыстану ғылымдары негізі) және үшінші сыныптан «Ақпараттық-коммуникациялық технологиялар» жаңа пәні енгізілді. Мектептегі білім берудің күнделікті өмірі контекстінің болуы тақырып мазмұнын терең меңгеру және жалпы танымдық дағдыларды дамыту үшін кең мүмкіндіктердің көзі болып табылады. Осылайша, бірқатар зерттеулерден анықталғандай, мұғалімдердің күнделікті өмірдегі контекстін пайдалану проблемаларды шешу үшін жалпы дағдыларды дамытады, күнделікті өмірдегі проблемаларды шешу үшін үйренген материалдарды пайдалануға көмектеседі, сондай-ақ оларды оқытуға ынталандырады. TIMSS және PISA халықаралық зерттеулеріне сәйкес, қазақстандық білім алушылар пәндік мазмұнды өте жоғары деңгейде ұстайды, бірақ контекстік ақпаратпен жүктелген міндеттерді шешуге әлдеқайда аз қабілетті.

Түйін сөздер: бастауыш білім беру, жаңарту, күнделікті өмір жағдайы, функционалдық сауаттылық, PISA, TIMMS.

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МОДЕРНИЗАЦИЯ СИСТЕМЫ ОБРАЗОВАНИЯ В КАЗАХСТАНЕ: ПЕРСПЕКТИВЫ И ПРОБЛЕМЫ

Аннотация. Современные тенденции в сфере образования республики и задачи, стоящие перед его различными уровнями, вызывают необходимость переосмысления их роли, функций и места в общей системе образования, выработки новых подходов в их дальнейшем развитии. Высокоэффективная система образования является одним из основных факторов обеспечения устойчивого роста экономики страны и казахстанского общества. Цель проводимых реформ в системе образования нашего государства – обеспечение качественного ее преобразования в условиях рыночной экономики с учетом глобализации. Реформирование образования требует создания новых правовых, научно-методических, финансово-материальных условий и адекватного кадрового обеспечения для углубления и развития этого процесса на основе сохранения накопленного в этой сфере позитивного потенциала. В Плане нации «100 конкретных шагов» Главы государства Нурсултана Назарбаева большое внимание уделено образованию. В частности, Президент Казахстана говорил о повышении качества человеческого капитала на основе стандартов стран ОЭСР (PISA, TIMMS). С 1 сентября 2016 года первые классы по всей стране перешли к обучению по программе 12-летней школы. Таким образом, начался переход к обновленному содержанию образования. С первого класса ввели новый предмет «Естествознание» (основы естественных наук) и с третьего класса – «Информационно-коммуникационные технологии». Присутствие контекста повседневной жизни в школьном обучении является источником широких возможностей как для более глубокого усвоения предметного содержания, так и для развития общих когнитивных навыков. Так, в ряде исследований было показано, что использование учителями контекста повседневной жизни в обучении развивает у учащихся общие навыки решения проблем, помогает им в применении изученного материала для решения задач в повседневной жизни, а также повышает их мотивацию к обучению. Согласно данным международных исследований TIMSS и PISA, казахстанские учащиеся владеют предметным содержанием на довольно высоком уровне, но значительно хуже справляются с заданиями, нагруженными контекстной информацией.

Ключевые слова: начальное образование, модернизация, контекст повседневной жизни, функциональная грамотность, PISA, TIMMS.

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