

**THE IMPACT OF STANDARTIZED TESTING ON EDUCATION QUALITY:
THE CASE OF THE PROGRAMFOR INTERNATIONAL STUDENT ASSESSMENT
(PISA) 2006 AND 2009**

Duishon Shamatov
American University of Central Asia, Kyrgyzstan

Introduction

This paper examines the impact of the Program for International Student Assessment

(PISA) 2006 and 2009 on the quality of secondary education in Kyrgyzstan. In 2006, Kyrgyzstan, along with 56 other countries and economies, took part in PISA. Kyrgyzstan was the first country in post-Soviet Central Asia to enter the PISA competition. PISA 2006 focused on students' competency in science. The results demonstrated that Kyrgyzstan's 15-year old students performed extremely poorly, with Kyrgyzstan placing last among all participating countries. However, to date, there are no in-depth studies examining the results and the impact of the PISA test on the quality of secondary education in Kyrgyzstan. Employing a series of semi-structured interviews and document analysis, this chapter describes what lessons were learned from the PISA experience, and whether the process had any significant impact on the quality of education in Kyrgyzstan. The paper also examines the phenomenon of how transnational forces such as PISA, an international comparative test, can affect education policy in Kyrgyzstan, and what the implications are of this impact.

Methodology

To study the impact of PISA on education quality of Kyrgyzstan, a qualitative research design was adopted (Hitchcock & Hughes, 1995; Merriam, 1988). The data were collected between June, 2009 and April, 2010 using semi-structured interviews and document analysis (Hitchcock & Hughes, 1995). Purposeful sampling was used to gain the maximum possible data (Merriam, 1988; Miles & Huberman, 1984) from expert respondents about the impact of PISA 2006 on education in Kyrgyzstan. Respondents to semi-structured interviews included two representatives of the Ministry of Education and Science of Kyrgyzstan and Kyrgyz Academy of Education, a specialist from the independent testing center (CEATM) which conducted the PISA 2006, two representatives of the Rural Education Project (REP) of World Bank (WB) which initiated Kyrgyzstan's participation in PISA competition. Professors from public and private universities, school administrators and teachers, community members and students were interviewed. In total, 30 people were interviewed. With the participants' consent, the interviews were taped to aid in recall and analysis (Frankel & Wallen, 1993). Prior to being interviewed, the respondents were selected on a volunteer basis, informed of the purpose and nature of the study and gave their written consent to be interviewed and have those interviews recorded. (Cohen & Manion, 1997; Clandinin & Connelly, 2000; Glesne, 1999).

Document analysis was used as another tool for investigation (Bell, 1993). To examine the questions related to the focus of this paper, namely, the reasons for Kyrgyzstan's participation in PISA 2006, current state of education, PISA's impact on education quality, a number of materials, reports and other documents were analyzed. Documents and reports of the Ministry

of Education and Science, reports of PISA 2006 by OECD and CEATM, mass media materials, and others materials were reviewed and analyzed.

Programme for International Student Assessment (PISA)

The Programme for International Student Assessment (PISA) is an international standardized test for comparative assessment of 15-year-old students' skills. It is the product of collaboration between participating countries and economies through the Organisation for Economic Cooperation and Development (OECD), and draws on leading international expertise to develop valid comparisons across different countries. The members and partners of OECD participate in the PISA process to assess the comparative quality and condition of their education systems.

The PISA process also highlights components of participant countries' individual education systems and offers recommendations to improve education quality. Thus, educational reforms and policies can be developed by participating countries, based on PISA results.

Educational authorities pay serious attention to PISA results because they provide objective and reliable data about education quality, and highlight both strengths and weakness of education systems (Figazzolo, 2009). Consequently, following PISA, many countries have launched educational reforms to improve their education quality and system in general. For example,

French President Sarkozy launched school reform under the 2007 Revision Generale des Politiques Publiques (general revision of public policies) using PISA 2006 results as a reference point, to support the educational reform in France. Similarly, German Education Ministers launched major educational reforms under the "Seven Action Areas" program to improve education and learning, based on the PISA 2000 and 2003 results. These examples demonstrate the impact of PISA beyond simply testing whether students have acquired predefined knowledge and skills from school curricula or not.

In PISA 2006, all 30 OECD member countries participated, as well as 27 partner countries and economies. In total, around 400,000 students were randomly selected to participate in PISA survey, representing about 20 million 15-year-old students from 57 participating countries.

Representative samples of between 3,500 and 50,000 15-year-old students were drawn in each country.

PISA 2006 focused on student competency in science. In today's fast-progressing globalized, technological world, understanding main scientific concepts and theories and the ability to solve science problems are more important than ever. PISA 2006 assessed not only science knowledge and skills, but also the attitudes which students have towards science, the extent to which they are aware of the opportunities that possessing science competencies may open, and the science learning opportunities and environments which their schools offer. PISA defines scientific literacy in terms of an individual's scientific knowledge and use of that knowledge to identify scientific issues, explain scientific phenomena, draw evidence-based conclusions about science related issues, and demonstrate understanding of the characteristic features of science as a form of human knowledge and enquiry, awareness of how science and technology shape our material, intellectual and cultural environments, as

well as willingness to engage with science-related issues. PISA measures scientific literacy across a continuum from basic literacy skills through high levels of knowledge of scientific concepts and examines students' capacity to use their understanding of these concepts and to think scientifically about real-life problems. Student performance scores and the difficulty of questions were divided into six proficiency levels.

Kyrgyzstan's Participation in PISA 2006

Since the break-up of the USSR, the Kyrgyz public and education community raised the issue of the dramatic decline of education quality in the country. Overall funding of education declined, and teachers' salaries lagged far behind any economic developments. There was a common feeling that education quality was deteriorating. Kyrgyzstan participated in PISA for the first time in 2006. The decision for Kyrgyzstan to participate in PISA was taken in 2005 by the Minister of Education and Science (MoES) of Kyrgyzstan with encouragement and financial support of the Rural Education Project of World Bank. A local consultant of REP of the WB commented,

We hesitated for a long time to go with PISA or not. We thought as it was an international test, there would be test questions which were comfortable for French children, for example, and not for our kids. We then reviewed all PISA documents, and had discussions with other consultants about how test items of PISA are developed. We learned that PISA test items undergo very thorough examination and review and are adapted to each country specifically. There should be no shocking questions to any student from any part of the world. Only when all participating countries say: "Yes, this suits our country", be it Ethiopia, the United States or Kyrgyzstan, are PISA test items approved. (Interview, April 3, 2010).

According to a specialist in the MoES, "Everyone was excited to participate and see the results of PISA. It could be a tool to demonstrate the state of education in our country, which area of the education system is not performing well, and how bad or good the system is in comparison with other countries." The REP consultant added, "It was important to know not only where Kyrgyzstan stood, but why we stood where we stood, and what should be done so that we could move forward." The following objectives for Kyrgyzstan's participation in PISA 2006 were identified by the MoES:

- a. To assess the educational achievement of Kyrgyzstan's students with a modern and international assessment tool;
- b. To define what place Kyrgyzstan occupies in the world among the other countries on level of preparedness of 15 year old schoolchildren for adult life; and
- c. To analyze the results of research and propose recommendations and ways of school development and improvement.

The PISA 2006 in Kyrgyzstan was conducted by the Center for Educational Assessment and Teaching Methods (CEATM), with financial support from the World Bank REP. Around 6000 students from 201 schools were randomly selected throughout the country. The test was conducted in Kyrgyz, Russian and Uzbek languages. In addition to the test, a survey was conducted with school children and school administrations.

PISA 2006 Results in Kyrgyzstan

The PISA 2006 results were first presented on February 7, 2008 at an event attended by all educational officials from the MoES, representatives from the President's Administration, members of the Kyrgyz parliament (Jogorku Kenesh), representatives of international organizations and other stakeholders (Kiyizbaeva,2008).The results of PISA2006 showed that 15-years old students of Kyrgyzstan performed extremely poorly. Among the 57 participating countries and economies, Kyrgyzstan took the last place.

Among the participating countries and economies, Finland performed highest in science (563 points); while Chinese Taipei (549 points), Finland (548 points), Hong Kong-China (547 points), and Korea (547 points) performed highest in mathematics; and Korea performed highest in reading (556 points). Students of Kyrgyzstan achieved a mean score of 322 points in science,

311 points in mathematics, and 285 points in reading. These are the lowest scores among the participating countries and economies. Even among the participating post-Soviet countries (which included Estonia, Russia and Armenia), Kyrgyzstan's results were poor. Only 13.6 % of

Kyrgyzstan 15-year-old students were able to carry out a basic level of tasks in science, 11.7 % - in reading and 11.8 % in math. Over 85% could not score even the basic level of the PISA scale, meaning that a great majority of students could not demonstrate the science competencies that would enable them to participate actively in life situations related to science and technology

(Report on PISA assessment results, 2007).

The PISA 2006 results provided solid evidence on the terrible state of secondary education in Kyrgyzstan. A specialist from the Kyrgyz Academy of Education stated, "On one hand, the PISA result was shameful for us, but on the other, it was very useful because we were able to identify education quality in Kyrgyzstan according to the international requirements. The poor result made all of us seriously think about our education system." (Interview, June 26,2009).

The REP specialist commented,

We knew the education quality was declining, but we did not have exact picture of what was bad and how bad it was. Therefore, the PISA results gave us documentary evidence as to where our position was. This is very significant evidence which no one can deny or ignore. Education ministers come and go, but these documents remain. (Interview, April 3,2010)

Impact of the PISA 2006 Results in Kyrgyzstan

The PISA 2006 results increased awareness of the actual state of the education quality in Kyrgyzstan.They also became a springboard for advocacy efforts. Government and education authorities started using the PISA results as a reference point in forums and meetings. The poor results of Kyrgyzstan in PISA 2006 were more than once used as a justification for the implementation of the reform by the government. REP Country Coordinator observed: "In all strategic and programme documents they [government] now include questions about PISA related to content of education, methodology and resources" (Interview, April 3,2010).

Also, the poor results of PISA 2006 gave the education officials an opportunity to strategically gain support from international development agencies. Silova and Steiner-Khamsi (2009) report that "They [government education officials] had to convey a graphic sense of educational crisis to attract external funding" (p.14). These new tactics were contrary to what government education authorities had been accustomed to do for many years, that is, to glorify that their goals had been accomplished, and often ahead of time. Now, they have become keen to state how far the education away from "international standards" was (Silova & Steiner-Khamsi, 2009, p.15).

Many education specialists and international development agencies also started using PISA to support their attempts to improve the state of education.

The PISA 2006 results impacted efforts to improve education quality and in some cases, the results catalyzed new action, in others they strengthened already existing efforts. Below are some examples of how the PISA results had a direct impact. Some of them were clearly illuminated by PISA and are being changed in response to PISA, while others are examples of government responses using PISA to lobby for more funds from international donors.

Curriculum Reform

The REP assessment specialist of the World Bank stated: "Our educational programmes do not meet the requirements or educational goals identified in the Education Development Strategy for 2011-2020. Our teachers mostly teach to develop rote memorization and retelling. But the PISA asks questions like 'Why? How do you use this formula? How does this formula work in real life?'" A specialist from CEATM added, "Our children cannot apply their knowledge in real life situations. For example, there was a question in the PISA test asking where you should put a torch in order to get maximum lighting in the room, which requires knowledge of physics. Most students from Kyrgyzstan could not answer the question correctly."

The PISA 2006 report recommended reforms to align curriculum with international standards and focus on modern skills and competencies at higher proficiency levels (Briller, 2009). "Curriculum is at the heart of everything, and all other reform initiatives are linked to curriculum reform. So, we are trying to change our curriculum according to international standards" (REP Country Coordinator, Interview, April 3, 2010). Curricular reforms actually pre-dated PISA 2006. A new national curriculum framework had been spear-headed by the Soros Foundation, Kyrgyzstan prior to the PISA 2006. Education Specialist, at the Soros Foundation commented:

The curriculum framework is a main document in education, and all documents should follow it. It describes goals and objectives of education at different levels, means to achieve those goals, including methodology of teaching and structure of organization of education system. For example, how many hours should be taught at primary or secondary level, how it should be assessed. It will also have graduate profiles which describe what a secondary school graduate should be able to do, his or her competencies. (Interview, July 28, 2009)

At the same time, the Asian Development Bank's the Second Education Project (SEP) had been developing subject-based curricula. This curricular reform also pre-dates PISA 2006. Subject based curricula for primary grades 1-4 have already been developed and approved, and subject curricula for grades 5-9 are yet to be approved. These curricula aim to develop students' competencies and include innovative teaching methods to achieve their objectives (SEP

Specialist, interview, April 3, 2010).

While the PISA did not initiate these curriculum reforms, the results provided clarity on where Kyrgyzstan stood internationally, and curriculum developers use the lessons and recommendations of PISA reports in their work. After the PISA 2006 results were announced, the Ministry of Education and Science of Kyrgyzstan strongly supported the curricular reforms, and pushed to expedite the process of curriculum development, which is just one step in a long process towards improving standards and quality in education.

If we complete the development of curriculum framework tomorrow, then the day after tomorrow, we will write textbooks according to new curriculum, and then train teachers accordingly. We will develop resources and then after we teach for five years, it will be necessary to participate in PISA and see the real outcome, pluses and minuses of this new curriculum. Thus, it will take about 10 years before we see some significant changes (Education Specialist, Soros Foundation of Kyrgyzstan, July 28, 2009).

Reduction of Education Load

According to PISA 2006 analysis offered by CEATM, overloaded learning time negatively affected the Kyrgyz students' performance in PISA 2006. The education programme in Kyrgyz schools, in terms of time spent in lessons, was the heaviest amongst all participating countries of PISA 2006. After the break-up of the USSR, new subjects were added to an already long list of subjects (Shamatov, 2010). The annual educational load for 15-years old students in Kyrgyzstan in 2006 was 1190 hours, while students in Finland clocked only 855 hours. As Steiner-Khamsi et al (2007, p.23) wrote "The breadth of knowledge required is overwhelming as is the limited amount of time in which teachers have to cover it. This also assumes that children attend school every day and that teachers also attend regularly". Currently, the Kyrgyz Academy of Education (KAE) is working to consolidate and reduce the existing subjects (Steiner-Khamsi et al, 2007).

However, longer contact hours for regular classes do not necessarily guarantee quality education. Therefore, reducing the amount of education load is a positive step forward. The next step is to ensure that the reduced amount of time is used efficiently, effectively and qualitatively. Extracurricular activities, such as science clubs, fairs, competitions and excursions also positively affect students' performance and also have to be scheduled.

Shortage and poor quality of textbooks

Shortage and poor quality of textbooks was another reason most respondents agreed on for the poor PISA 2006 results. Insufficient quantities of textbooks and teaching materials, especially in Kyrgyz language, and the poor quality of available textbooks and teaching materials were commonly reported to lead to poor quality education. According to the National Statistics Committee (2008), only 17% of Kyrgyz-medium schools are supplied with about 50% of their textbooks, and only 18% with more than 80% of their textbooks. Over 30% of Russian-medium schools are supplied with less than 50% of their textbooks, and only 24% of Russian-medium schools are supplied with more than 80% of their textbooks.

Poor quality of textbooks is attributed to the textbook development and publication procedure. Currently, one institution, the Kyrgyz Academy of Education (KAE), is responsible for

developing requirements for writing and approving textbooks. As a result, there is a conflict of interest, which has led to low quality of textbooks as a result of the monopolization of the textbook development. Textbooks are developed by authors who are hired and approved of by the KAE, but are usually removed from school life. Thus, according to the education official from Jalal-Abad, the textbooks these authors develop are usually overly theoretical and difficult for both teachers and students to use.

Teacher shortages

Teacher shortage was identified in Education Development Strategy for 2001-2020 as "the greatest barriers for quality improvement" calling it "the crisis of the pedagogical cadre". Shortages and inadequate quality of teaching personnel was a significant factor contributing to the poor PISA performance of students from Kyrgyzstan. "About 25% of students from schools participating in PISA did not take one or more science classes in academic year of 2004-2005.

Only 3% of students studied at schools where there were no vacancies for science teachers, and 72% of vacancies were filled by teachers of other subject areas" (CEATM report, 2009). This result provides alarming insight into the availability of qualified and quality teachers in Kyrgyz schools.

According to the specialist of the Ministry of Education and Science, teacher shortages remained between 3,000 and 4,000 each year from 2002 to 2007. Additionally, the percentage of young new teachers who enter the teaching profession is decreasing with rates of approximately 60% in 2005 falling to 35% in 2007. Even those that begin teaching, do not remain in schools very long due to professional and socio-economic difficulties (Shamatov, 2005). According to data collected by the district education office staff in 2007, schools lost 32% of foreign language teachers, 27-28% of Russian language teachers, 27-28% of computer science teachers, 15% of history teachers, 15% of biology teachers, 12% of primary grade teachers and 12% of mathematics teachers (USAID, 2009).

Ineffective teaching methods

Ineffective teaching approaches were also commonly believed as one of the main causes for the poor PISA results. This was linked to poor systems of pre- and in-service training for teachers and the lack of consistent and motivational teacher evaluation systems. Most teaching was reported to be poor and not aligned with modern theories and practices of teaching and learning.

A specialist from KAE observed:

More than 70 percent of teachers in Kyrgyzstan are doing their job inertially or routinely. They just come to work, pretend to be teaching and then leave. Teachers only cover the daily plans which are developed by the Ministry of Education. Only about 5 percent of teachers run update their knowledge. Students also do not like teachers' teaching these days, because what teachers teach often has no relevance to students' daily lives. (Interview, June 25, 2009)

It is essential to improve the quality by teaching subjects in greater depth as well as with more effective teaching methods and materials. Even though the competency-based

approach to teaching and student assessment is inscribed in the current curriculum framework it remains to be implemented in practice. Many international development agencies are assisting local education authorities to provide effective in-service teacher education by introducing elements of student-centered and interactive teaching methods. However, pre-service teacher education has been left neglected as "large donors considered teachers to be "lost generation," not worth investing in (Silova & Steiner-Khamsi, 2009. p.32); higher education reform has not been a priority of international aid; and finally, given that fewer than half of teacher education graduates ever enter the teaching profession, it is not seen as a good investment.

Shortage of resources and materials

Inadequate educational resources can explain the dismal results of students from Kyrgyzstan. The PISA 2006 survey that examined the level of school resources demonstrated that compared to other OECD countries, schools in Kyrgyzstan have a very low level of school resources (OECD, 2007). There are significant relationships between the level of material resources and overall performance. Over 90% of school directors surveyed for PISA 2006 referred to lack of, or low quality of, physical and material resources as laboratories, textbooks, computers, Internet access, libraries, audio-visual means, and other tools as a cause of poor quality of education.

The supply of resources and materials remains problematic. Government education officials have managed to use the PISA 2006 recommendations to gain support and more resources from donor agencies.

Lack of school autonomy and financial reform

The lack of school autonomy was also stated as a reason for the poor PISA result. From 2005, as part of decentralization reform, state funds were allocated to village governments who were responsible for distributing money to schools. School administrators' ability to develop and manage their budget, formulate school curriculum, and adjust school management in order to compete with other schools is severely limited by a centralized system that continues to mirror the system put in place during Soviet times. School curriculum is formulated and administered centrally by the Ministry of Education and Science, and schools have little flexibility in adjusting curriculum and school management. The budget allocation process, which involves bargaining and centralized discretion, is nontransparent, unpredictable, cumbersome and does not address long-term strategic issues, resulting in an inflexible and inefficient use of scarce resources.

In response to this issue, per capita school financing was implemented (Briller, 2009). This was done to increase "cost effectiveness and efficiency by decentralizing education finance, including financial autonomy at school level by introducing per capita financing, and by enhancing social accountability and participation" (Silova & Steiner-Khamsi, 2009, p. 19).

Since 2006, the Ministry of Education, with support from the World Bank and USAID, is piloting per capita finance at schools. The per capita funding system is a process of decentralizing budget management to the school level, opening access to school budgets and introducing accountability mechanisms to budget management. It prioritizes school

autonomy, allowing schools to make allocative choices in their budgets, according to their individual needs.

Equity Issues

The PISA2006 results also highlighted existing issues related to equity and access to quality education. Students at private and elite urban schools of Kyrgyzstan showed significantly better performances in PISA 2006 than their rural counterparts¹. The higher social and economic level of students in these schools, one of the main factors affecting literacy level, clearly impacted the test results. Post-Soviet officially endorsed diversification of schools which created "new type" schools further stratified Kyrgyz society. A small number of parents can now afford to choose quality education for their children (EFA, 2000). However, almost 70 percent of Kyrgyzstan's population lives in rural areas and 83 percent of schools are in rural settings (UNDP report, 2003). Rural schools in post-Soviet Kyrgyzstan are experiencing devastating challenges. They lack funds and material support from the government, and serve impoverished communities. Rural community members normally have a low opinion of education and teachers and students have additional responsibilities including agricultural work, which compete with their school work.

PISA 2006 confirmed the huge gap between quality of education offered at urban and rural schools. Unfortunately, this gap is increasing; some urban schools are becoming stronger, while the majority of rural and mountain schools are deteriorating. The large majority of rural, semi-rural and mountain schools still teach facts and memorization, but the PISA test assesses higher-order thinking and application of knowledge in real practical life.

Analysis and Discussion

The results of the PISA2006 were shocking for Kyrgyzstan. However, the dismal performance in PISA 2006 also inspired self-reflection and self-realization by the Kyrgyz school system. Administrators and educators are now increasingly involved in advocacy and policymaking. The PISA 2006 results have shaped public opinion through references via the mass media, and education policy debates have been impacted. While policymakers initiated reforms in education before the PISA 2006 findings, they are now legitimizing their recommendations and actions with the PISA results.

Reforms and set-backs following the PISA 2006 are impacted by the broader context. There is also a lack of strong local capacity of education experts and policy makers. Reforms are implemented sporadically and ad hoc with different planning agencies and implementing bodies that do not communicate. Most reform initiatives and documents are conceptualized and designed primarily by international agencies. "Education system reforms have been driven primarily by the agendas and procedures of the funding and technical assistance

1 Since the break-up of the USSR, which (at least in theory) aspired egalitarian principles, the issues of equity have become less pronounced. Though Soviet education espoused equality and uniformity, many scholars argue that Soviet schooling was never really monolithic or egalitarian, contrary to official doctrine. Besides clear disparities between Russian- and non-Russian-medium schools, obvious status differences existed between urban and rural schools as well as between schools with an emphasis on English or Mathematics (Niyozov, 2001; also see Sutherland, 1999). Korth and Schulter (2003) observe that the Russian-medium schools continue offering better education than schools in Kyrgyz and other local languages. The Russian schools continue to enjoy high prestige and are attended by children of different linguistic backgrounds, while the Kyrgyz schools are attended exclusively by Kyrgyz children (Korth & Schulter, 2003).

agencies" with the result that reforms are imposed externally rather than initiated internally (Silova & Steiner-Khamsi, 2009, p. 10). Since independence, Kyrgyzstan has been subject to a myriad of international education assistance projects including international agencies, private foundations and philanthropists and international non-governmental organizations. These international organizations are now assisting the Ministry of Education to conduct major education reform, using the results and lessons learned from the PISA 2006. Reform has been initiated in a range of areas including curricular reforms, introduction of standards and or outcome-based education, student-centred learning, decentralization of education finance and governance, and standardization of student assessment.

While the contributions of the donor agencies are praiseworthy and much needed, often there is dissonance between the discourse of donors and the local needs. It is still unclear whether the initiatives of donor agencies truly reflect local needs and bring about sustainable improvements.

Besides, different components of education, such as curriculum framework, subject curriculum, assessment, teacher development, textbook development are being worked on by different agencies who work often with little or no communication. There is no effective coordination between all the international and national institutions working on educational sector. KAE specialist argued:

It is true that there are many international organizations working on education sectors, but the problem is that in most cases they choose education issues and problems for their project themselves without asking the MoES suggestions. Sometimes, they repeat already implemented projects. Unfortunately, the MoES also does not actively suggest educational issues. (Interview with KAE specialist, June 25, 2009).

There is often lack of systematic, well-coordinated effort (REP Assessment Specialist, April 3, 2010). On the contrary, there is often overlap and duplication. Most reform initiatives are not institutionalized, indicating a lack of sustainability (Steiner-Khamsi et al, 2007). Systemic change on education system is only possible when all stakeholders and international organizations coordinate their activities with each other and when the initiatives focus on strengthening institutionalization and sustainability.

Conclusions

Developing new standards and curriculum, reducing education loads, modernizing school infrastructure and equipment, improving teaching standards and performance, introducing per capita financing were some of the reforms that got new impetus due to the results and Lessons of the PISA 2006. The PISA 2006 results provided further proof that the national standard of education has to improve and there is a need for significant changes in curriculum and teaching methodologies. These changes are now being implemented by the Ministry of Education, with the support of international donor agencies. PISA has been a driving force for reforms, though within current economic constraints, it is difficult to expect drastic changes. The Ministry of Education has been using the PISA results actively in gaining support from international donor agencies. The PISA data have been largely used by different actors in the educational debate in different ways to support their positions.

The PISA test demonstrated that there is a huge gap between quality of education offered at urban and rural schools. Unfortunately, this gap is not decreasing but on the contrary increasing. Few urban schools are becoming stronger while large majority of rural and mountain schools are changing for the worse. The large majority of rural, semi-rural and

mountain schools still teach their students for 'facts' and 'memorization', but PISA test assesses higher-order thinking and application of knowledge in real practical life. In PISA 2006, one of the main reasons that Finland scored top position is due to fact that it has a strong secondary school system across the country, and there is no huge divide between quality of education in urban and rural settings. Almost all students in Finland have access to quality education. As this is a matter of public policy, the Kyrgyz government needs to recognize this increasing gap between quality of education is strengthening existing inequalities and it needs to invest to improve education quality, particularly in rural schools so that gap is reduced.

PISA 2006 provided a reliable and objective assessment of education quality and can effectively strengthen messages for reform to government authorities and other stakeholders of education.

The test results showed that the majority of students cannot apply their knowledge and skills in real life situations. They have little understanding of concepts and they mostly memorized concepts and facts. This is dangerous for the country's future, because if school students do not develop critical and analytical thinking skills, problem solving and cannot use their knowledge in real life, they will become citizens who are very poorly prepared to address issues and challenges of our dramatically changing societies. The PISA results are a wake-up call that have already, and can further, strengthen education reform efforts in Kyrgyzstan, as long as that reform is carried out in a systematic and well-coordinated way.

Michael Fullan (1992), analyzing the history of successful and unsuccessful reforms, asserted that most reforms fail because those who push for change do not involve all stakeholders, do not recognize complexity of their problems, and adopt superficial and quick solutions. Moreover, failure to institutionalize an innovation underlies the disappearance of many reforms. To truly build on the results of PISA 2006 and initiate the necessary changes, reforms in the education system of Kyrgyzstan must be systematic and sustainable, and based on the inputs of all stakeholders.

Finally, I propose to conduct a comparative research study on the impact of international assessment (e.g., PISA) to development of education policies and improvement of education quality in Russia, Kazakhstan and Kyrgyzstan. The comparative research can provide useful insights into what mechanisms are being adopted by a particular country and whether it has been successful or not, and whether any effective strategies can be disseminated across the neighboring countries.

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