

PISA 2009: WHERE DOES TURKEY STAND?

The dependency ratio (the ratio of the number of children and the elderly to the number of the working-age people) is decreasing significantly in Turkey, offering a very important opportunity for the country to accelerate its socio-economic development. Yet, the opportunity will not last forever: it is expected to close around 2020. The best instrument in the hands of Turkey to turn this opportunity to a real advantage is improving the quality of education of its education services. The results of international tests, however, do not present an optimistic picture: According to the PISA 2009 results released by the OECD in December 2010, Turkey stands as the 32nd among 34 OECD countries, and 40 percent of Turkish 15-year-old students cannot reach basic competence level in mathematical literacy. Moreover, socioeconomic background plays a huge role in determining the success of the Turkish student, and schools are more or less segregated in line with the socio-economic background characteristics of their students. This paper underscores possible reasons and results of this situation, and what alternative future directions Turkey may take if learning outcomes can be improved.

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In Turkey, access to primary and secondary education has dramatically increased over the last decade. Although raising enrollment and completion rates at both primary and secondary education levels are necessary, they are not sufficient for ensuring basic knowledge and skills (such as effective use of spoken and written language skills, computation and other mathematical skills, in multiple situations) for all children. Indeed, according to recent research, it is the knowledge and skills acquired during primary education rather than the number of years of schooling completed that have an important positive impact on personal socio-economic mobility¹ and national economic growth.² Hence, national and international education plans and programs must focus on learning acquisition and outcomes rather than enrollment and completion of certification requirements. In this context, better and more contextualized analytical work is needed on learning outcomes and their determinants at both the primary and secondary level.

The foremost aim of international students' assessments is not only to assess the attainment of objectives recorded in curricula and command of learning contents as such, but also to assess students' knowledge and competencies in contexts as close to real-life situations as possible. Among international students' assessments, one of the oldest and most widely conducted is PISA (Program for International Student Assessment), which is applied by the OECD. PISA, applied to 15-year-old students in all participating countries, aims to assess to what extent students have acquired knowledge and skills that are essential for full participation in society and the variation in these skills over time.

PISA takes place every three years and is performed on a representative sample. Moreover, variables related to the households' characteristics and school learning environments are collected through the survey. PISA's structure allows not only monitoring education systems' outcomes in terms of student achievement on a regular basis but also comparing how students in a given country are performing on a set of common tasks compared to students in other countries.

Turkey has been participating in PISA since 2003. PISA 2009 marks the third time that Turkey has participated in the tests, thus making trend analysis possible. PISA 2009 covers three areas: reading skills, mathematical literacy and science literacy. It measures not only the specific knowledge on a subject but also assesses whether students can extrapolate from what they have learned and apply their knowledge in new situations.

¹ Paul Glewwe "Schools and Skills in Developing Countries: Education Policies and Socioeconomic Outcomes", *Journal of Economic Literature*, 40 (2): 436–82.

² Eric Hanushek and Dennis Kimko.. "Schooling, Labor Force Quality and the Growth of Nations", *American Economic Review*, 95 (5): 1184–208.

In each area, test items are a mixture of multiple-choice items and questions requiring students to construct their own responses.³

This paper provides a review of the results of PISA 2009 announced in December 2010. Results for Turkey will both be compared to results of other countries and to Turkey's previous results. They will also be analyzed in the context of equity in education. In conclusion, views will be shared on the tasks that fall upon different stakeholders in order for Turkey to get the highest returns from these international tests that fill an important gap in the Turkish education system.

Turkey's Performance in PISA 2009

Turkey registered substantial gains in PISA scores over time. Mean score in science test increased from 424 points in 2006 to 456 in 2009. Turkey's mathematics score improved in a similar manner – from 424 in 2006 to 445 in 2009. In reading test, the improvement in PISA scores for 15-year-olds in Turkey was 17 points from 447 in 2006 to 464 in 2009.

Numerous factors can help explain Turkey's improved performance. On one hand, it could be argued that the Basic Education Reform that started in 1997 and the Teaching Programs Reform initiated in 2004 have started to bear fruits. The increase in PISA scores can also reflect the corresponding improvement of students' own skills. On the other hand, increased awareness of PISA implementations could have motivated both the schools and students, thus leading to an increase in scores. Further research using PISA datasets needs to be conducted in order to understand the reasons behind this improvement in performance in 2009.

It is worth mentioning that despite this progress, Turkey's average scores in overall are well below the OECD average. Moreover, over these years, Turkey's position vis-à-vis other countries has not seen considerable change. In PISA 2006, Turkey was 29th among 30 OECD countries with only Mexico having lower scores. In PISA 2009, Turkey ranked 32nd out of 34 OECD countries, followed only by Chile and Mexico. Out of the four countries that joined OECD in 2010 (Chile, Estonia, Israel and Slovenia) Turkey's performance was only better than Chile's.

Another issue as important as the average scores achieved on the tests is the distribution of students according to competency levels. PISA defines these levels by what the students are capable of achieving. In reading, mathematics and science tests, Level 2 is defined as the "basic competency level" and all students below this level are considered not (yet) having gained the necessary skills to actively

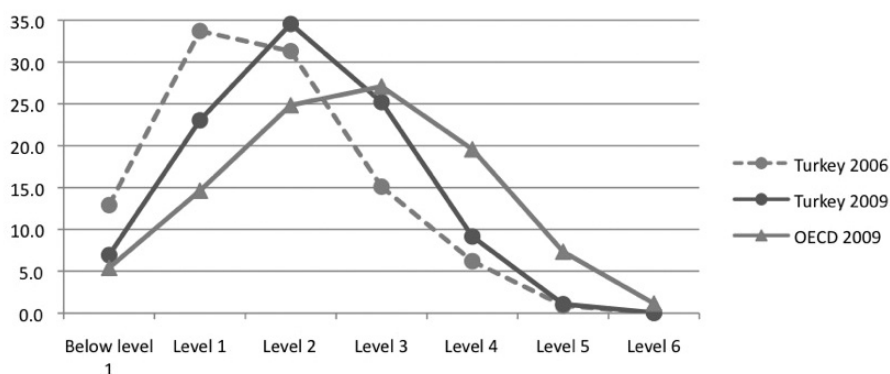
³ OECD 2009, PISA 2009 Assessment Framework – Key Competencies In Reading, Mathematics And Science, OECD, Paris.

take part in society. Students on Level 5 and Level 6 are described as “high level” and are considered to have internalized critical thinking skills. It is assumed that students who were able to reach these “outstanding performance” levels have acquired enough skills to play a role in creation of new knowledge and technology in the future.

The results Turkey attained in 2009 suggest that the percentage of children who were below the basic competency level decreased in all tests and there were substantial increases in Level 3 students. On the other hand, the number of students who were able to reach Levels 4, 5 and 6, which are considered to be the levels in which high-level learning skills have been attained, are very low compared to other OECD countries (See Table 1).

It should be kept in mind that PISA does not cover all 15-year-old children but students of this age. Furthermore, 15-year-olds are outside the scope of mandatory education in Turkey. According to the data from the 2009 Household Labor Survey, 54 percent of children between the ages of 15-19 in Turkey are enrolled in schools.⁴ Net secondary education enrollment rate for 14-17 year olds was 65 percent in the 2009-2010 academic year. But 11 percent of the students enrolled in secondary education have dropped out in the 2008-2009 academic year and four percent has had at least 20 days of absence in 2009-2010. After all these facts are considered, it could be said that only 55-60 percent of all 15-year-olds in Turkey attend school regularly. When children who are not enrolled in schools and who are most likely at a lower knowledge and skill level are also accounted for, Turkey’s average performance and level distribution will be worse than what is reflected by PISA scores.

Figure 1: Distribution of students in Turkey and the OECD to competency levels (%) in Science Literacy test



Source: OECD, Results of PISA 2006 and PISA 2009. Equity in Education: Attaining the Basic Skills

⁴ Gökçe Uysal-Kolaşın and Duygu Güner, “Araştırma Notu 10/91: Gençler Beşeri Sermaye Yoksunu [Youth Lacks Human Capital]”, Bahçeşehir University Economic and Societal Research Center, 2010, <http://betam.bahcesehir.edu.tr/tr/wp-content/uploads/2010/10/ArastirmaNotu091.pdf>

One of the most important education goals is to help overcome social and economic inequalities. To achieve this goal, the education system should provide the basic skills and competencies that all individuals will need in order to participate in social life. Moreover, it should include mechanisms that minimize the chance of achievement in education to be determined by factors such as socioeconomic background or place of residence that cannot be easily altered by the individual.⁵ Through the data it collects and evaluates, PISA makes it possible to conduct an analysis regarding the fulfillment of the equity principle in education.

“...in Turkey 40-45 percent of 15-year-old children are not in school.”

As previously mentioned, PISA tests define Level 2 as the “basic skill level”. It is assumed that student who score below this level have not yet acquired the knowledge and skills that would enable them to effectively participate in social life and higher education. Therefore an increase in the number of students who could not reach Level 2 harms equity in education.

The number of students who scored below the basic skill level has rapidly decreased in Turkey, especially between 2006 and 2009. On the reading skills test, 37 percent of students in 2003 and 32 percent of students in 2006 were unable to reach the basic skill level; this rate was 24.5 percent in 2009. On the mathematics literacy test, there was no significant change between 2003 and 2006. However, in 2009, the share of students below the basic skill level dropped from 52 percent to 42 percent. Despite this decrease, the percentage of students who remained under the basic skill level is well above the OECD average of 25 percent. The main progress has been on the science literacy test: whereas the percentage of students below the basic skill level was 46 percent in 2006, this figure decreased to 30 percent in 2009. From an equity perspective, a smaller number of students below the basic skill level is very promising. However, it is worth underscoring once again that in Turkey 40-45 percent of 15-year-old children are not in school. Therefore they were not considered in this evaluation. Assuming that the majority of children in this group have lower academic achievement levels than children attending school, it can be claimed that almost half of 15-year-old children do not have basic skills.

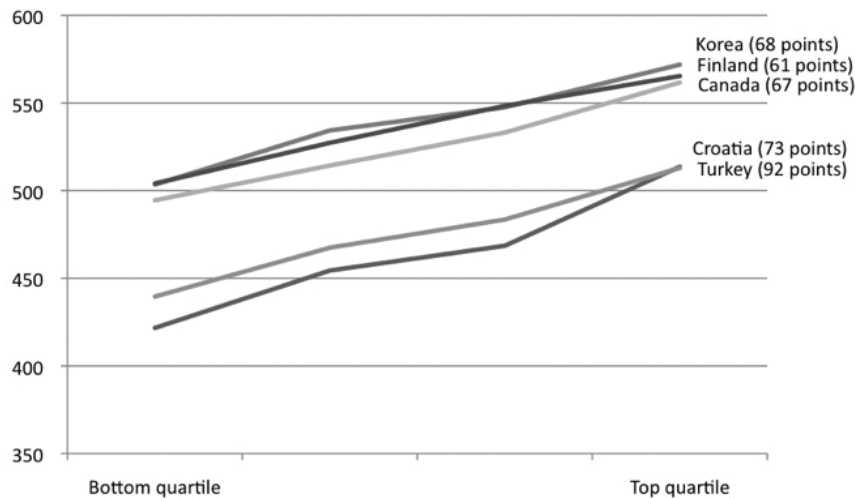
Equity in Education: Alleviating the Effect of Socio-economic Background on Academic Achievement

The Economic, Social and Cultural Status (ESCS) index, which takes the socio-

⁵ For a more detailed explanation of the approach: Education Reform Initiative, *Eğitimde Eşitlik: Politika Analizi ve Öneriler* [Equity in Education: Policy Analysis and Recommendations], 2009.

economic condition of each student into account allows us to answer the following questions: What is the difference between the test scores of students from higher socio-economic backgrounds and those from lower socio-economic backgrounds? How much of the difference in test scores is explained by students' socio-economic background? When the "achievement gap", i.e. the difference between the test scores of the students at the bottom quartile of ESCS index and those of the students at the top, is calculated, the gap in Turkey appears to be wider than the gap in OECD countries. The average achievement gap in the OECD is 88 points, whereas the gap in Turkey stands at 92 points. Graph 1 shows the distribution of the reading test scores of five countries according to the ESCS index. Korea, Canada and Finland all have better average performance levels and relatively smaller achievement gaps. The achievement gap in Finland is especially low at 61 points. Croatia, with its average performance similar to Turkey's, has an achievement gap of 73 points. Slopes of the lines in the following graph can also be interpreted as indicators of the extent to which socio-economic background plays a determinative role.

Figure 2: Average scores in selected countries according to socioeconomic status groups and the achievement gap (in parentheses)



Source: OECD, Results of PISA 2006 and PISA 2009.

Another way of measuring the impact of socio-economic background on student achievement using PISA data is to look at the percentage of achievement difference between students that is directly explained by ESCS. 19 percent of the difference between student achievements in Turkey is explained by ESCS, suggesting a high level of correlation between the student's socioeconomic background and her/his achievement in the test. This is the highest value amongst OECD countries after Hungary and Belgium. This percentage has also risen six points – from 13.1 percent in 2006 to 19 percent in 2009. Even though complete eradi-

cation of the impact of socio-economic background on student achievement does not seem feasible in the short run, Turkey's education system is not successful in alleviating this condition. Inequality in education is an issue that needs an imminent solution in Turkey especially considering that Turkey scored the third highest value among other OECD countries on the Gini index, which measures income inequality. In order to design and implement policies that will alleviate the impact of socio-economic background on student achievement, it is crucial to identify the existing factors in the education system underlying this phenomenon. Lack of mechanisms to support disadvantaged students and to overcome the negative impact of coming from a disadvantaged background appears to be the most important issues to deal within the education system.

"Turkey scored the third highest value among other OECD countries on the Gini index, which measures income inequality."

Equity in Education: Narrowing the Gap Between Schools

PISA dataset also indicates that in Turkey, schools are segregated by socio-economic background, which further deepens the gap between students' achievements. According to a study conducted using PISA dataset, schools in all countries are divided into three groups according to the average ESCS index of their respective student pools: advantaged schools, disadvantaged schools, and mixed schools.⁶ According to the ESCS index, while 64 percent of the children from the bottom quartile attend disadvantaged schools, only seven percent are able to attend advantaged schools. Moreover, 64 percent of the children from the top quartile attend advantaged schools and eight percent attend disadvantaged schools. Turkey is one of the four countries in the OECD where mixed schools have the lowest weight. Low number of mixed schools leads socioeconomically and achievement-wise similar students' studying together. This creates a vicious circle that perpetuates the widening of the achievement gap in the education system and of social inequalities.

The division of schools according to types, differences in quality, and centralized examination systems constitute the main reasons for socio-economic segregation in Turkey. Placing students in schools as a result of a series of competitive examinations

⁶ The schools are separated into these groups using the average ESCS index of their own students. Thus, if the average ESCS score of students in a school are high, the school is recognized as an "advantaged" school. Yet, the fact that the average ESCS score of students in one school is high does not directly mean that all students in this school have high ESCS scores; the school may have students from a wide range of socioeconomic status

intensifies student achievement and quality differences between schools and school types, which in turn enhances competition in examinations and increases the role socio-economic background plays in students' achievement. This process has become symptomatic throughout the years, solidifying socio-economic segregation at the school level. The Ministry of Education took some steps in 2010 to resolve this issue. The first among these steps was the removal of the Level Placement Exam –implemented at the end of sixth and seventh grades– with the aim of mitigating the effect that these exams might have on learning processes. Although this policy may reduce the inclination to resort to resources outside of school, it does not provide a permanent solution. The second applied policy was the abrogation of three-year general high schools and their conversion into Anatolian and vocational high schools. With respect to the quality of learning processes in general high schools, a period no less than three years will be needed for their successful transformation into Anatolian high schools. Even though it increases their quantity, this policy does not remove the hierarchy between Anatolian high schools, but rather spreads the hierarchy around the system. This may lead to the reinforcement of the role that socio-economic background plays in education facilities by increasing the effect of central examinations on the system.

“PISA dataset also indicates that in Turkey, schools are segregated by socio-economic background, which further deepens the gap between students' achievements.”

One of the most effective policies to reduce the effect of socio-economic background on student achievement is the provision of high quality preschool education. Preschool education during early childhood is crucial to achieve equality in education, as it enables intervention before the cognitive differences resulting from socio-economic backgrounds are established. Surveys carried out during PISA asked stu-

dents whether they received any preschool education. In Turkey, 72 percent of students stated that they never received preschool education, 20 percent stated they received it for a year or less, and only eight percent had more than a year of preschool education. The average scores of students who received a preschool education of one year or less are 42 points higher than the average scores of those who never attended preschool. However, this point difference is diminished to 13 points for students who are from equivalent socio-economic backgrounds. This shows that in Turkey, socio-economic background is a determining factor even for preschool education attainment (at least for students who were 15 years old in 2009) and that the potential of preschool education to help overcome inequalities is not fully realized. Policies applied by the Ministry of Education regarding rapid

spread of preschool education look hopeful from the perspective of equality in education. However, preschool education inequalities may lead to a deepening of later inequalities if disadvantaged children are not prioritized. Also, quality of education is important for preschool education to create the expected impact. Analyses conducted with PISA data show that positive effects of preschool education increase when the length of education increases, when the number of students per teacher decreases, and when public spending per student increases.⁷

Summary and the Way Forward

According to the PISA results, there has been significant progress among Turkish students below the basic skill level. However, there has not been significant change in Turkey's international rankings despite the improvement in its average scores. Moreover, there are very few students who display an outstanding performance and there has not been an increase in their number. Finally, when the relationship between socio-economic background and academic achievement in Turkey is compared to other countries, the correlation is much higher and is bolstered by the fact that schools are divided according to socio-economic background.

Results from PISA data are valuable because they allow for the deductions explored in this paper and further allow researchers to come up with international comparisons. We believe that international tests such as PISA and TIMSS (Trends in International Mathematics and Science Study) should be continued. In order for these tests to be properly executed and evaluated, there are tasks that need to be carried out by the central administration of the Ministry in Ankara and school administrators:

- The central administration of the Ministry should ensure that discussions on PISA results are thorough and participated by experts from different fields. The Minister, as the representative of political will, should take part in these discussions and evaluate the results in light of current policies.

- It should be kept in mind that PISA reflects the outcomes of education. Under the Ministry's 2010-2014 Strategic Plan, the goal of including PISA scores was mentioned under the section "Relations with International Organizations". However, improvement of PISA scores should be defined as a goal directly related to student achievement and these results should be used to monitor the Turkish education system.

- The Ministry should encourage further research using PISA data and use these results in determining policy orientations.

⁶ OECD, PISA 2009 Results: Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes, 2010.

- Opportunities should be taken to increase the amount of information that can be obtained from PISA. For example, in 2009, Turkey refused to take part in the voluntary survey that targeted parents. Yet the parent survey is an important resource to collect data about the socio-economic backgrounds of students. In the future, Turkey should be willing to participate in such voluntary surveys.
- The Ministry should both continue to participate in surveys such as PISA and TIMSS, and begin to work towards the creation of a similar achievement evaluation system on the national level. Experiences from PISA should be made use of in order for the evaluations to be carried out in needed areas and time intervals.
- It should not be forgotten that PISA is carried out only for diagnostic purposes. International tests are not intended for competitive purposes between students, schools, regions or countries. Ministry officials should never use the word “competition” in an effort to increase the motivation of students and schools. Such a situation would hurt the reliability of results and destroy the purpose of a very important tool evaluating the outcomes of education.