

PISA 2009: EI analysis

EI Research Unit

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The OECD new PISA 2009 Report has been published on December 7, 2010, 11am Paris time, with simultaneous launch events in Washington DC, Brussels, Berlin, Tokyo and London. Full reports and database are available online on the OECD website:

http://www.oecd.org/pages/0,3417,en_32252351_32236225_1_1_1_1_1,00.html

PISA 2009 is a massive publication, with 5 different reports covering 65 participating countries (including all 32 OECD member countries) – together, they comprise almost 90% of the world's economy. PISA 2009 presents contextual indicators relating results to student and school characteristics, together with trend indicators showing how results change over time. This is the first 'after-crisis' PISA, hence particularly relevant for a (partial) assessment of the impact of the global financial crisis on education systems across participating countries.

1. What students know and can do: Student Performance in Reading, Mathematics and Science?

In its fourth full cycle, PISA focuses again on **reading literacy** as its key domain. It was the main sphere in 2000, replaced by mathematics in 2003 and science in 2006, respectively. PISA 2009 also updates the assessment of performance in Mathematics and science, on a less analytical level. The main results are presented in Volume I.

Concept of reading literacy

PISA uses its own concept of reading literacy. It assesses the range of situations in which students read, the various ways in which people receive written texts from electronic to print media, and the different uses of reading: from the simple utilitarian purpose of finding information to the deep, thorough analytical reading and even understanding of "other ways of doing, thinking and being"¹. The OECD says that such level of reading attainment really equips students for success in future life. Even if this can be true, a question arises: can such level of reading ability really be assessed by PISA or any other standardized tests performed by 15-years old students? PISA does not take into account national curriculum, so they even may not have been taught such tasks as measured by PISA. Moreover, as the OECD acknowledges, the mastery of reading is a life-time effort, which cannot be measured in normative manner at any given time, as there are continuous gradations of performance above and below any set performance thresholds. Doubts in academic circles have been raised about the scientific validity of PISA conclusions. While it will always be difficult to make the ultimate judgment on education research, the results must be seen in this perspective.

¹ PISA 2009, Vol. 1, p13

The argument about PISA, however, goes beyond testing techniques and scope of curriculum. It is basically about its methodology and concept of education. While the dichotomy between knowledge and skills can be justly seen as false (because they both are part of pedagogical aims), nevertheless, the emphasis on one inevitably undermines the other.

Part of a broader paradigm shift in education in last decades, changing the main goal of education from knowledge acquisition to skills' development on how to apply acquired knowledge in various contexts of life situations, PISA has given priority, from its very inception, to skills over knowledge.

Consequent to its fundamental approach, **PISA understands goals and purpose of reading literacy in a somehow utilitarian way.** The 2009 Report defines reading literacy as *"understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society."*² This declared objective can be seen as limited, looking from the perspective of education as a holistic development of personality, and even in contrary to the elsewhere stated correlation in PISA between success in reading and enjoyment of it, the latter being critically important for life-long-learning.

Changes in reading assessment between 2000 and 2009

The reading assessment framework in PISA 2009 has been developed further adjusting it to the developments of the past decade. In difference with PISA 2000 reading test, **in 2009 PISA assesses not only how well students retrieve and interpret information, but also how they access and integrate it.** This was made partially possible through the use of computer-based tests in twenty participating countries. PISA 2009 also expands and details the assessment frameworks in order to divide students in six different proficiency levels. Optional tests are provided to assess lower-performing students, with test items for basic reading skills as well as more complex tests for higher-performing students. In addition there were improvements made in students' background questionnaires. Compared to previous cycles, students are asked in addition about their reading strategies, approaches, motivation and use of new technologies. The latter part has been filled by students in 44 participating countries.

While all these developments and adjustments make undoubtedly PISA more complex and detailed, they also limit its comparative value both between countries in 2009, and between the cycles. This is particularly relevant to note, as progress measurement between 2000 and 2009 cycles is one of the main targets of this report.

Country rankings

As in previous cycles, PISA summarizes country performance in ranking tables, separately in each domain, and with remarkable variety by different aspects.

The main "surprise" of PISA 2009, in terms of competition for place in league table, is the first place taken by Shanghai-China, with a mean score of 556 points. Top-performing countries or economies in reading literacy include Hong Kong-China (with a mean score of 533), Singapore (526), Canada (524), New Zealand (521), Japan (520) and Australia (515). The Netherlands (508), Belgium (506), Norway (503), Estonia (501), Switzerland (501), Poland

² PISA 2009, Vol.1, p37

(500), Iceland (500) and Liechtenstein (499) also perform above the **OECD mean score of 494**, while the United States, Sweden, Germany, Ireland, France, Denmark, the United Kingdom, Hungary, Portugal, and partner economy Chinese Taipei have scores close to the OECD mean. The lowest performing OECD country, Mexico, has an average score of 425. This means that the gap between the highest and lowest performing OECD country is 114 points – more than the equivalent of two school years, according to OECD estimates. And the gap between the highest and the lowest performing partner country is even larger, with 242 score points – or more than six years of formal schooling – separating the mean performance of Shanghai-China and Kyrgyzstan (314).

In PISA 2009, mathematics' assessment Korea, with a country mean score of 546 points, performs highest among OECD countries. The partner countries and economies Shanghai-China, Singapore and Hong Kong-China rank first, second and third, respectively. The OECD countries Finland, Switzerland, Japan, Canada, the Netherlands, New Zealand, Belgium, Australia, Germany, Estonia, Iceland, Denmark, Slovenia as well as the partner countries and economies Chinese Taipei, Liechtenstein and Macao-China also perform significantly above the OECD average in mathematics.

Shanghai-China, Finland, Hong Kong-China and Singapore are the four highest performers in PISA 2009 science assessment.

Differences **between** countries represent, however, only a fraction of the overall variation in student performance. Addressing the educational needs of diverse populations and narrowing the gaps in student performance that have been observed, rather than increasing their rank position, remain a key challenge for all countries.

However, while the OECD emphasizes the gap in achievement between countries, it can be seen the opposite way – as remarkable similarity. On reading scale 32 countries, including all OECD countries, except Chile and Mexico, differ from OECD mean score only by 20 points above or below it. This corridor of 40 points can indeed be seen as representative of the whole OECD region and allow to interpret the results **as very close and similar** indeed. Such possible interpretation should be taken into account when addressing one of the key repetitive points of PISA over the cycles, i.e. that countries with similar levels of income produce very different results. The OECD argues that while there is a correlation between GDP per capita and educational performance, this only predicts 6% of the differences in average student performance across countries. The remaining 94% reflect the fact that two countries of similar prosperity can produce very different educational results. The OECD uses the example that the best performing entity in PISA 2009 (Shanghai-China) and the best OECD country (Korea) are both below the OECD average GDP level. This assumption is questionable.

Certainly, there are significant differences of students' distribution among the six proficiency levels between countries. However, this can be quite clearly explained if we look at the different levels of economic development. The proportion of students in each proficiency level in most of the richer countries appears very different from that of the poorer countries. In reading, for example, the ten countries in which the majority of students are at level 1, or below, are all from the poorest parts of the world, while in the 32 OECD countries the majority of students attain, on average, at least level 3.

It is important to note that three of the top performing “entities”, i.e. Shanghai-China, Macao-China and Hong Kong are not countries, but provinces of China. This brings us to the question: what if other countries would be allowed to select certain provinces or cities to participate alongside and on the same terms as the entire country? What will be selection criteria? This question will become an even more persistent in the future, as it is expected that the participation of selected areas or provinces not only from China but also from other non-OECD countries will increase, as part of the drive to expand the PISA coverage worldwide. Consequently, the OECD will use more evidence from such select territories for policy recommendations.

2. Overcoming Social Background, Equity in Learning Opportunities

PISA 2009 Volume II *Overcoming Social Background, Equity in Learning Opportunities and Outcomes* looks at how factors such as socio-economic background and immigrant status affect student and school performance, and the role that education policy can play in moderating the impact of these factors. The Volume explores *equity in education* from three perspectives: (a) the distribution of student performance on the PISA assessment; (b) the distribution of learning resources, i.e. the extent to which students and schools have access to similar educational resources, both in quantity and quality; (c) the distribution of learning opportunities, in other words the impact of the family and the socio-economic background of students and schools on learning outcomes.

Importance of socio-economic background on students' performance

One of the most important messages of PISA is that the best performing school systems manage to provide high-quality education to all students. Canada, Finland, Japan, Korea and the partner economies Hong Kong-China and Shanghai-China all perform above the OECD mean performance and students tend to perform well regardless of their own background or the school they attend; these countries have large proportions of students performing at the highest levels of reading proficiency, and relatively few students at the lower proficiency levels. The PISA 2009 tries to emphasize that schooling does matter and can reverse the negative effects of background, even if the evidence often points to the contrary.

The Report assesses **the extent to which the performance differences relate to the socio-economic background of students**. Across the OECD, 11% of all variation in student reading performance can be attributed to differences across countries, while 34% arises from differences among schools and the remaining 55% can be attributed to differences among individual students. The performance variation within countries is often very large. In general, though, the Report argues, countries characterised by wide socio-economic disparities are not necessarily those in which the relationship between socio-economic background and performance is more marked: *equity in educational opportunities can be achieved even when the socio-economic background of students varies widely*. Furthermore, country differences of students' socio-economic background explain only a small part of the PISA 2009 differences of the quality and equity of school systems. The examples of Poland, Hungary, Korea and France are given as countries characterised by more socio-economically disadvantaged backgrounds than countries at the OECD average, yet mean performance in reading is at or above the OECD average.

The PISA 2009 admits that home background nevertheless influences educational success, and schooling often appears to reinforce its effects. Although poor performance in school does not automatically follow from a disadvantaged socio-economic background, the socio-economic background of students and schools does appear to have a powerful influence on performance. However, some countries succeed in reducing the impact of socio-economic background on learning outcomes. While most of the students who perform poorly in PISA are from socio-economically disadvantaged backgrounds, some peers (*resilient students*) from similar backgrounds excel, demonstrating that overcoming socio-economic barriers to achievement is possible. In Korea and in partner economy Macao-China, 50% and 56% of disadvantaged students can be considered resilient, and this percentage is 72% and 76% in partner economies Hong Kong-China and Shanghai-China, respectively.

One given explanation is that regardless of their own socio-economic background, students attending schools with a socio-economically advantaged intake tend to perform better than those attending schools with more disadvantaged peers. The Report insists that in the majority of OECD countries, the effect of the school's economic, social and cultural status on students' performance far outweighs the effects of the individual student's socio-economic background, and the magnitude of the differences is striking (for instance in Japan, the Czech Republic, Germany, Belgium and Israel, and in the partner countries Trinidad and Tobago and Liechtenstein). This can be supported by evidence that **students in urban schools perform better than students in other schools, even after accounting for differences in socio-economic background**. In Turkey, the Slovak Republic, Chile, Mexico and Italy, as well as the partner countries Peru, Tunisia, Albania, Argentina and Romania, this performance gap is quite remarkable. However, the opposite is true when looking at family status. On average across the OECD, 17% of students come from single-parent families' score lower than students from other types of families. Among OECD countries, the gap is particularly large in the United States, after accounting for socio-economic background.

Immigrant students

The issue is even more confused about the role of family background among immigrant students. Across OECD countries, first-generation students³ perform below students without an immigrant background. However, there is no positive association between the size of the immigrant student population and average performance at the country level, and there is also no relationship between the proportion of students with an immigrant background and the performance gaps between native and immigrant students. **These findings contradict the assumption that high levels of immigration will inevitably lower the mean performance of school systems.**

On average, more than 10% of 15-year-old students across OECD countries are foreign-born or have foreign-born parents. That is why PISA also compares the reading performance of students with and without an immigrant background, in the same country, and between countries. Students with an immigrant background constitute a heterogeneous group. However, they generally tend to be outperformed by students without an immigrant background (exceptions are Australia for both first- and second-generation students, and Israel and Hungary where second-generation students outperform students without an immigrant background), even if

³ Those who were born outside the country of assessment and who also have foreign-born parents

the size of the performance gap among these groups of students varies markedly across countries. Second-generation students tend to outperform first-generation students, as they were born in the country and therefore benefited from the education system of the host country from the beginning of their schooling trajectories (despite this, second-generation students also lag behind those without an immigrant). In general, students with an immigrant background are socio-economically disadvantaged, and this explains part of the performance disadvantage among these students. Moreover, students with an immigrant background whose language at home is different from the language of assessment face considerable obstacles to succeeding in school. In any case, the performance of students with an immigrant background cannot be attributed solely to their country of origin; often, in fact, students with an immigrant background tend to face, additionally, the double challenge of coming from a disadvantaged background themselves and going to a school with a more disadvantaged profile.

Teachers matter

One of the most striking findings in PISA 2009 is that **disadvantaged students may have access to more teachers, but not necessarily to the best teachers**. With the exception of Turkey, Slovenia, Israel and the United States, where socio-economically disadvantaged schools also tend to be deprived in terms of basic resources, OECD countries place an equal, or even a larger, number of teachers into socio-economically disadvantaged schools. In spite of this, disadvantaged schools still report great difficulties in attracting qualified teachers – quantity of resources does not necessarily translate into quality of resources.

Strategies for moderating the impact of social background

At the end of Volume II, the OECD presents policy recommendations that could be helpful in mitigating the effect of social economic background on performance. First the report suggests targeting low performance, regardless of students' background, either by targeting low-performing schools or low-performing students within schools. Where academic inclusion is low, interventions may be targeted at low-performing schools; where academic inclusion is high interventions can be directed at low-performing students in each school. Then, addressing disadvantaged children through a specialised curriculum, additional instructional resources or economic assistance for these students, with policies designed at school or individual level. Third, while policies targeted at disadvantaged children can aim at their performance in school, they can also be used to provide additional economic resources to these students, with an emphasis on improving the economic circumstances of students from poor families (providing free transportation and free lunch programmes for students from poor families), rather than offering specialised curricula or additional educational resources. More universal policies should rely mainly on raising standards for all students: altering the content and pace of the curriculum, improving instructional techniques, introducing full-day schooling, changing the age of entry into school, or increasing the time spent in language classes are likely to be most relevant in countries with less variation in student performance. Finally, as inclusive policies strive to include marginalised students into mainstream schools and classrooms, systems should concentrate on involving students with disabilities in regular classrooms, rather than segregating them in special classes or schools; or try to reduce between-school socio-economic segregation by redrawing school catchments boundaries, amalgamating schools, or by creating magnet schools in low-income areas.

3. Learning to Learn

Volume III measures several indicators on student engagement, strategies and practices. *Learning to learn* has some important policy implications. First, effective learners need to set learning goals, select strategy and control and evaluate the learning process but it should not come at an expense of the enjoyment of reading. Second, the more the students enjoy reading and the more engaged they become, both off and on line, the higher their reading proficiency. Furthermore, across OECD countries, more than a third of students report that they do not read any type of material for enjoyment regularly. Fourth, engagement and effective learning strategies can mitigate socioeconomic background. Finally, PISA 2009 also shows that enjoyment of reading is not enough. Teachers, parents and schools need to provide students with successful strategies to become effective learners.

Learning strategies are important

A student who knows what strategies can make him/her a better learner has higher scores. This goes for both the awareness of strategies (new 2009 indicator) to understanding and remembering information as well as for strategies for summarising information. The reported use of strategies to control one's learning is also related to a higher performance in every country, though not as strong as the awareness of effective learning strategies. This does not mean that giving all students more autonomy will lead to better results. Weaker students need to be taught how to learn effectively.

Overall, **the strategies that are mostly connected to performance are those for understanding and remembering information, strategies to summarize information and control strategies.** Reported uses of elaboration and memorization strategies are associated with performance in some countries but not in all. In PISA 2009, 13 countries do not respond to memorization strategies. In 25 countries, the strategy is associated with poor performance, while it is associated with positive in 24. Elaboration strategies, such as exploring how reading material relates to the outside world, are usually positively connected with reading performance. However, in PISA 2009, there are marked differences within countries. For example, in Japan, Portugal, Norway, Korea, Chinese Taipei, Jordan and Macao-China, the top quarters of students are at least 35 points better than the bottom quarter of students.

Gender differences are wide

Girls have higher mean performance, enjoy reading more and are more aware of effective strategies to summarise information than boys, but differences within genders are greater than between genders, especially for the weaker boys. Boys read more comic books and newspapers. Girls read more magazines and fiction while girls also read slightly more non-fiction books. Girls use more memorization and especially control strategies than boys. On the other hand, boys tend to report making greater use of elaboration strategies, but gender differences are small. In eight OECD countries and 12 partner countries, girls are just as likely as boys to use elaboration strategies. The size of the gender gap varies a lot across countries, which proposes that boys and girls do not have inherently different interests and academic strengths, but that these are socially induced and acquired.

Levelling the playing field is not insurmountable

Socio-economic disparities in levels of engagement in reading and use and approaches to effective learning strategies are smaller than gender differences (1/3 to 2/3), but if students approached learning as positively as the quarter of students with the greatest socio-economic advantage, there would be large gains in their reading proficiency. Socio-economic differences in reported use of learning strategies are relatively large. For example, on average across OECD countries, the untapped potential of socio economically disadvantaged boys represented by their low levels of internal motivation to read is 35 points. If they had the same awareness of effective summarizing strategies as socio economically advantaged girls do, the gap between them and average student performance would be predicted to be a third narrower.

However, according to the OECD discourse on changing students' attitudes and values, **a much more effective way for change is to provide equal access to high quality teachers and schools, two of the factors that explain low performance of disadvantaged students.** In the short term, this might entail catering to boys' preferences, especially the disadvantaged boys but, on the longer term, it would mean a strategy to shrink the gap in reading by efforts of parents, teachers and society at large.

Where is the Learning Environment?

According to PISA, socio-economic background is still a large predictor of any students' success. PISA 2009 "Learning to Learn" seems to suggest that the learning strategies and gender differences in reading are not insurmountable if the equity, access and quality of the school system and general inequalities are addressed. PISA for example suggests that socio-economic disadvantaged students' reading gap can be mediated by successful targeting these students and their needs. Especially, summarizing information has been show to have a large correlation to socio-economic background. Systems with lesser equity, e.g. tracking of students, generally show worse performance and the associated cost would be higher.

However, PISA own theoretical viewpoint of gender difference as an inherently socially induced phenomenon also suggests that different strategies must be sought to cater for boys, and especially younger boys, when it comes to learning environment. In that respect, PISA could have made reference to the findings regarding equity in school systems, and not only to socio-economic background and gender differences, which are the main indicators adopted for predicting differences in reading. In this aspect, **PISA adopts a highly individualized approach to competence and neglects the learning environment where learning is constructed.** The view of the competence to learn in Volume III is therefore fundamentally a **functional** one, that is, young people who do not have the basic skills will not be able to "*meet the needs of a fast-changing and increasingly globalised labour market*". The incessantly focusing on competition between international labour markets may push back the relevant national focus on what works in a national context and in the local learning environment.

In addition, PISA cannot establish causation⁴ between awareness of learning preferences and performance. Instead, PISA 2009 implies that these strategies themselves are correlated. The

⁴ With regards to cultural bias the same can be said to enjoyment of reading, and especially whether or not students are proficient enough to ascertain what constitutes a good learning strategy. The 2010 review of learning strategies in PISA 2003 math show us, that a large amount of the students who themselves believed they had a preference for an effective learning strategy also had lower

nature of learning defines self-regulated learners as one that “*manage their own time, set higher goals for their learning and follows their learning more and more accurately than others. They are also better at judging their own abilities (self-efficacy) and have greater persistence.*”

Learning environments, with the self-regulated learner at its core, are also characterized by a strong focus on formative feedback and on social and collaborative learning. Teachers should not only have professional and pedagogical knowledge but also knowledge about how the students build their own knowledge. Focus is on cognition, emotions, motivation and neuroscience, the reports claims. A good learning environment entails six fundamental basics:

- It makes learning central, encourages engagement, and in which learners come to understand themselves as learners;
- It is where learning is social and often collaborative;
- It is highly attuned to learners’ motivations and the importance of emotions;
- It is acutely sensitive to individual differences including in prior knowledge;
- It is demanding for each learner but without excessive overload;
- It uses assessments consistent with its aims, with strong emphasis on formative feedback;
- It promotes horizontal connectedness across activities and subjects, in- and out-of-school.

4. What makes a school successful? Resources, policies and practices

Volume VI of PISA 2009 “*What makes a school successful? Resources, policies and practices*” explores what resources, policies and practices are in place in countries with successful education systems (defined by high student performance irrespective of their socio-economic background) and how these features of schools relate to student performance both within and across school systems. This volume also addresses the relationship between resources for education, policies and practices and the socio-economic background of schools and students.

Broadly speaking, Volume IV presents the **three features related to student performance and equity in education that are shared by ‘successful’⁵ school systems**. These include: low levels of student differentiation in institutions, grade levels and classes; high levels of school autonomy in determining curricula and student assessment policies with low levels of school competition; and high spending in education that prioritises teachers’ salaries. Within schools and classrooms, students are found to perform better in disciplined classroom environments,

performance. At the same time, high performing countries had low “self efficacy” – thus the underperforming students did much worse than their preference would suggest and the students with low “self efficacy” did better than they should, theoretically.

⁵ In PISA, ‘successful’ education systems are defined by ‘relatively high-achieving students and greater equity in learning outcomes, because socio-economic background has only a moderate impact on performance’ (p. 25)

and where student-teacher relations are amiable. Students who have attended pre-school education also show better results.

Considering these 'successful' features more closely, PISA 2009 not only highlights what features are shared by high-performing education systems, but also which features do not bear any relation to student performance and may even exacerbate socially unequal performance: horizontal division of students into various tracks based on their ability does not improve performance; high levels of competition between schools for students has little relation to student performance (when accounting for socio-economic background), and may in fact contribute towards segregation and the exclusion of socio-economically disadvantaged students (especially when financial constraints – such as tuition fees- are in place); and attendance at private schools is not related to student performance (also after socio-economic backgrounds are accounted for). As stated: 'successful school systems provide all students, regardless of their socio-economic backgrounds, with similar opportunities to learn', and thus cannot be systems in which high levels of school choice, privatisation and vertical and horizontal division of students are the order of the day.

Many of the findings in PISA 2009 on system resources, policies and practices are similar to those found in the previous PISA 2006 cycle, indicating that certain characteristics of an education system are conducive to better student performance and equity over time, and that these features do not only reflect current policy and practices. This is important when bearing in mind, for example, the impact that the current social and economic crisis has had on education systems worldwide, and what implications this may have for the development of education policy in the future. While Volume IV does not provide recommendations as such, reiterating that causality is not measured by PISA, the message is evident: **for education systems to be 'successful' and equal, not only in PISA but in building future knowledge economies, they ideally should be inclusive (comprehensive), non-competitive, and autonomous, and in which teacher preparation and higher salaries contribute towards better teaching quality.** Maintaining, or achieving such systems, requires investment of resources (both financial and human), and equal distribution of those resources.

With regard to the selection and grouping of students, PISA 2009 shows that where grade repetition and student transfers are more common practices, both performance and equity tend to be lower. Students from lower socio-economic backgrounds are also more likely to be adversely affected by these practices. Horizontal division of students into tracks based on abilities does not improve overall performance. Overall, high levels of differentiation at the school, grade and class level do not lead to better performance and may in fact enhance social inequity.

A number of key findings are emphasised in PISA 2009 with relation to school governance and allocation of educational resources. PISA reveals that **successful schools systems are those in which greater autonomy granted to individual schools to decide what is taught and how students are assessed**, but do not necessarily allow schools to compete for enrolment, nor are private schools widely available. Within countries, schools that compete for students may have higher performance levels, but PISA notes that this is accounted for by the higher socio-economic status of students in such schools, suggesting that in such cases, socio-economically disadvantaged students end up in lower-performing schools, leading to an unequal education system. Specifically, concerning assessment, the use of standards-based external examinations

holds a positive relation to system performance, but there is no relation between performance and the use of assessment for accountability purposes.

One of the main findings of PISA 2009 is that **differences in performance are related to autonomy in combination with accountability**. In countries where schools are held accountable for their results by publicly posting these results, schools that have greater autonomy in resource allocation perform better. PISA thus suggests that some forms of autonomy and accountability in combination are related to better outcomes, rather than each policy own its own. Such accountability mechanisms may however increase competition between schools, hence directing school choice, and possibly causing inequities in education systems. Caution should be borne when considering what forms 'accountability' should take, and what purpose they should serve. Using achievement data to allocate resources to schools, or provide incentives to teachers may lead to inequities within systems.

Another major finding of PISA 2009 is related to the allocation of resources in comparison to overall spending on education. PISA refers to previous research when arguing that there exists a weak relationship between educational resources and student performance. **Student performance is affected by the quality of human resources (teachers and school principals) rather than financial resources**. PISA 2009 finds that education systems that prioritise higher teachers' salaries over smaller classes show a tendency to perform better. While Education International supports improving teacher quality through increased teacher salaries, arguably increased quality of education would also entail adequate professional training for teachers and smaller class sizes, which in turn would require increased resources. PISA 2009 leaves it somewhat in the middle, concluding that: 'if there are ways in which higher investments can be used to recruit more qualified teachers or provide professional training that increases their effectiveness, this could be money well spent. The bottom line is that the quality of school system cannot exceed the quality of its teachers'.

Furthermore, PISA 2009 reveals that some countries show a strong relationship between school resources and their socio-economic profiles, suggesting that resources are unequally distributed between schools. Logically, this would point to the necessity for increased resources targeting disadvantaged schools.

5. Learning Trends - Changes in student performance since 2000

Volume V tries to present in a consistent form the results from all the previous PISA assessments. PISA in general, and especially in its trend aspect, cannot be compared to the longitudinal social surveys as, for example, British Cohort Study or British Household Panel Survey [now UKHLS]. First of all, it is because the full PISA assessment in reading was performed only twice, and in mathematics and science once only. Secondly, because of the level of uncertainty of the results PISA reports: 57% of the estimated changes in countries performance in reading between 2000 and 2009 have no statistical significance for PISA, and authors warns us to treat them as 'real change'. Third, PISA just takes a snapshot from a specific period in educational life of random students – no one repeats the tests on the very same group of students each cycle to measure if they made any real progress.

Do good results achieved by student in PISA automatically evolve in successful life? OECD claim that performance in PISA can serve as proxy for future success, however without any systemic longitudinal data about further fate of assessed students. Of course, there is well-known exception represented by the Canadian Youth in Transitions Survey. But, in this case, what had been measured was the level of future problems of students who performed in PISA 2000 below level 2. It is quite obvious that anyone who has not gained basic literacy skills will have much more problems in transition to adulthood in contemporary knowledge societies. However, what about those students who performed well in PISA? Is there any proved influence on their future careers? There is no answer to be found in PISA 2009. The possible conclusion which can be drawn from this situation is that PISA is interested not in the development of students' well-being, or their future success *per se*, but mainly in the progress made by policymakers in transforming the educational systems to be more effective in delivering skilled workforce to global knowledge-based economy.

The biggest part of the group of countries who achieve big progress in students' performance in reading consists of those that in last decade have narrowed, transformed and adapted their national curricula and educational programmes to demands and criteria imposed by PISA. Success stories (for example Korea, Poland, Chile) of educational systems included in Volume V offer a picture of huge policy efforts engaged in adaptation processes. When we look at the trends in changes of percentages of students who read for enjoyment, we can observe elevated decreases (Portugal 18%, Latvia 12%, Chile 14%, Korea 9,5%, Poland 9%, Peru 6%). This comparison shows that **there is possibility to increase the performance without widening students' horizons** (by process of non obligatory reading). It is likely that narrowing the scope of educational programmes to teaching skills, which are necessary to achieve good effects in tests like PISA, can affect negatively students' interest in reading for enjoyment. Education process in such conditions just turns to be a mere training in increasing the performance in tests.

Conclusions

With all respect to its innovative approach and design, **PISA cannot claim objective judgement about quality of education systems**, neither about progress over time, as it is a thematically narrow snapshot of a sample of 15 years old students at one point of time. There is no longitudinal aspect in PISA. Despite these limits PISA remains one of the most informative comparative studies in today's world.

Teachers' voice is missing in PISA. PISA reports increase the relevance of contextual factors analysis for interpreting the students' performance data. However, despite having students, school leaders and parents' background questionnaires, PISA constantly ignores teachers, therefore ignoring the most important source for contextual information on learning and social conditions.

PISA results show that some countries simultaneously demonstrate both high average performance and a relatively moderate relationship between student background and performance, suggesting that **equity and performance are by no means opposing or impossible policy objectives**. Students with more socio-economically advantaged backgrounds generally perform better. Anyway, the relationship between student performance

and the PISA index of economic, social and cultural status is far from deterministic. Many disadvantaged students are “resilient”⁶, while a sizeable proportion of students from privileged home backgrounds perform below what those backgrounds would suggest. **Overcoming socio-economic barriers to achievement is possible.**

While PISA 2009 does not provide direct policy recommendations as such, reiterating that causality is not measured by PISA, the message is evident: **for education systems to be ‘successful’ and equal, not only in PISA but in building future knowledge economies, they ideally should be inclusive (comprehensive), non-competitive, and autonomous, and in which teacher preparation and higher salaries contribute towards better teaching quality.** Maintaining, or achieving such systems, requires investment of resources (both financial and human), and equal distribution of those resources.

⁶ A disadvantaged student is classified as resilient if his or her residual performance is found to be amongst the top quarter of students’ residual performance from all countries