

PISA: A Comparison between Students' Performance of Albania and

Serbia Based on Gender Ratio

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Abstract: PISA (Program of International Students Assessment) is one of the international tests that values 15 years old students' performance. It is presented in 2000, with reading literacy as mainly in focus. It assesses students in three domains: reading literacy, mathematics literacy and scientific literacy, where each of them is in focus every three year and the two others secondly in focus.

This research keeps in focus the results of PISA 2009 and PISA 2012, because in these two years Serbia and Albania took part in this assessment simultaneously. It is done a comparison between their students' performance based on the gender ration on the three domains; to see in which country boys or girls perform better in reading literacy, mathematic literacy and scientific literacy. There is also a short overview on the engagement, drive and self-beliefs of the students in school for both of the countries. Why Serbian students perform better than the Albanian one? Is this fact related to their self-beliefs about school or their engagement?

Key words: students' performance, PISA assessment, comparison study, gender ratio

1. Introduction

PISA (Program for International Student Assessment) is a program that tests students aged 15 to 65 different countries of the world. This age was selected because it is the age at which students most countries close their school compulsory cycle. This test assesses students in some areas are in reading literacy, mathematics and science. Program evaluation also takes students who have skills in computers and solving problems that will not be evaluated in its infancy. This assessment takes into study and other factors relating to the likes and dislikes of students, learning how they assess and evaluate leisure or teachers, so class spirit in general. PISA assesses and many other factors as investments made in connection with education, education and training of students, the education of parents and others.

The purpose of PISA is not to determine who is the best student or weakest, but compare which educational system of the participating countries is the best. This assessment takes place every three years and began in 2000 (PISA 2000) having a field study in focus (reading literacy) and two other (mathematics and science) secondary in focus. In 2003 the focus was on math, the science in 2006, starting again with the ability to read in 2009 and so on. In PISA 2015 we have the closing of a second cycle. Albania has not taken part in PISA 2003 and PISA 2006, and Serbia did not take part in PISA 2000.

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Firstly it is given a short presentation on the economic and demographic overview of these two countries in years.

Table 1 gives the GDP Growth in percentage per year, starting from 2000 until 2012. There are also data from the GDP per capita (\$) for year 2000 and year 2014. It is seen that GDP growth per year differ; in 2000, 2005, 2006 and 2007 the growth per year is approximately the same, in years 2002 and 2004 Serbia had the greater growth in GDP per year, and in the other years Albania had the greater growth. The other data also given in this table are the GDP per capita in 2000 and in 2014. From the data we have that the GDP per capita in 2000 is greater for Albania, but the increase of Serbian economy in 2004, made that GDP per capita in 2014 is greater for Serbia.

Table 2 (World Bank Data) gives the number of population in 2000 and 2012. It is seen that for both countries the population have decreased. The greatest decrease of the population is for Albania, it is approximately 6.1% and for Serbian 4.2% of decrease of its population.

These two factors are related closely with the teaching process, the first is related with the investments that the government do in the education sector, and the second is in increase or decrease of students' number in a classroom.

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	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	GDP per capita 2000 (\$)	GDP per	capita
															2014(\$)	
Albania	7.3	7.0	2.9	5.7	5.9	5.5	5.0	5.9	7.5	3.4	3.7	2.5	1.6	1,175.8	4,588.6	
Serbia	7.8	5.0	7.1	4.4	9.0	5.5	4.9	5.9	5.4	-3.1	0.6	1.4	-1.0	870.1	6,200.2	

 Table 1
 GDP Growth in Percentage per Year and GDP per Capita (World Bank Data)
 GDP Growth in Percentage per Year and GDP per Capita (World Bank Data)

	1		
Country	2000	2012	Difference
Albania	3,089,027	2,900,489	188,538
Serbia	7,516,346	7,199,077	317,269

 Table 2
 Albanian and Serbian Population in 2000 and 2012 in Total and the Decrease

2. Review of the Literature

PISA is an international assessment that evaluates the performance of 15 years old students. It is chosen this age since in many of the participating countries it is closed the compulsory education (OECD, 2003). But do all the countries finish the compulsory education in this age?

In most industrialized countries, the majority of students continue their formal public education for other two or three years; and they are exposed to more content in mathematics, science, and reading during those remaining years. (Tienken, 2014)

This raises question marks for the knowledge that these tests requires to the students. It is true that PISA assess students in their basic knowledge (OECD, 2003), but is this basic knowledge taken from these students?

PISA is not the only international assessment test; there are others that assess the students' knowledge. But PISA is the only one that assesses students in three domains simultaneously evaluating also some of their background and feelings as: child poverty, parents' background, their self-beliefs, drive and engagements (OECD, 2013). It makes PISA as the most completed international assessment. PISA emphasise more the usefulness of education in practical situations rather than focusing mainly on curriculum and academic achievement (Lingens, 2005). Does this assessment have any dark side? There are many problems raised in relation to this assessment

because many pundits of education are leaded from the results of this assessment. They over evaluate PISA, and go over what PISA actually says regarding its ability to judge quality (Tienken, 2014).

One of the most problems that influence students' results in PISA is their poverty. It is a strong relationship between poverty and test results (Tienken, 2014) that does not help the countries that are not economically favoured as it is Albania and Serbia (World Bank data).

3. Methodology

3.1 Materials and Method

Method used in this study is based on the PISA one, because the data are taken from OECD publishing. Below we will do a short presentation what PISA uses to assess the students of the participant countries.

3.1.1 Assessment Instruments

The main instruments in PISA assessment are tests and questionnaires. The selected students will undergo a written test of two and a half hours. The test consists of questions about subjects of Mathematics, Science and Reading. In the end, these students will complete a questionnaire that is Student Questionnaire. In addition, the participating heads of schools will be required to complete a questionnaire which is the School Questionnaire.

3.2 Tests Used and Type Questions

Tests have questions where the answer given by circled the correct alternative and open-ended questions that require students to structure themselves provide the answer.

3.3 Questionnaires

The Student Questionnaire will be filled by students participating in student testing. So every student responds selected for testing meets the test and the student questionnaire. Students respond to the questionnaire give information about themselves, their families and their self-beliefs and engagement towards their learning process. The questionnaire takes them 20-30 minutes to complete.

The school Questionnaire, it is for each school selected and it is completed by the school principals. It takes 20 minutes to complete. The information collected from these surveys helps countries to study various effects that affect student performance.

4. Results

This section gives an overview of the students' achievement in both countries based in gender ratio. There are divided based on the domain, for both of the assessment taken in consideration; PISA 2009 and PISA 2012.

4.1 Reading Literacy

Firstly, it is made a presentation of students' performance in reading literacy for both PISA 2009 and PISA 2012.

As it is seen from Table 3, the percentage of Albanian students in low levels of difficulty (below Level 1b, Level 1b and Level 1a) it is greater than the Serbian one. This percentage is the same also for the boys and girls performance for both countries. But is seen that for the students that perform lower than Level 1b, the percentage of boys is greater than the girls' one. This means that in reading literacy girls perform better than boys, for both countries. A large percentage of Albanian students are below Level 1b of difficulty, this means that these students

do not have the basic knowledge, especially the boys with 17.5%.

	Below level 1b (Less 262.04 points score)		Level 1b (262.04-334.75 points score)		Level 1a (334.75-407.47 points score)		Level 2 (407.47-480.18 points score)		Level 3 (480.18-552.89 points score)		Level 4 (552.89-625.61 points score)		Level 5 (625.61-698.32 points score)		Level 6 (above 698.32 points score)	
	А	S	А	S	А	S	А	S	А	S	А	S	А	S	А	S
Percentage in total	11.3	2.0	18.7	8.8	26.6	22.1	25.6	33.2	14.4	25.3	3.1	7.9	0.2	0.8	0.0	0.0
Percentage of boys	17.5	3.2	24.4	12.4	27.2	27.0	19.7	31.5	9.7	19.8	1.5	5.6	0.0	0.5	0.0	0.0
Percentage of girls	4.9	0.7	12.8	5.1	26.0	17.1	31.9	35.0	19.4	30.8	4.8	10.1	0.3	1.1	0.0	0.0

Table 3 Percentages of Students at Each Level of Proficiency on reading Literacy in PISA 2009 Based on Gender

Source: OECD (2010)

Level 2 of difficulty shows that the percentage of students for both countries is approximately the same, but girls have a greater percentage especially the Albanian one. It is shown that increasing the level of difficulty, the percentage of Albanian students' decreases, especially the percentage of the boys. Also Serbian girls perform better than boys because in the lowest levels of difficulty they have lower percentage and in the highest levels of difficulty they have the higher percentage than boys. It is seen than in Level 6 of difficulty the percentage for girls and boys in both countries is 0%, this means that none of the students perform in that level.

Below level 1b (Less 262.04 points score)		Level 1b (262.04-334.75 points score)		Level 1a (334.75-407.4 7 points score)		Level 2 (407.47-480.18 points score)		Level 3 (480.18-552.89 points score)		Level 4 (552.89-625.61 points score)		Level 5 (625.61-698.32 points score)		Level 6 (above 698.32 points score)		
	А	S	А	S	А	S	Α	S	А	S	А	S	Α	S	А	S
Percentage in total	12.0	2.6	15.9	9.3	24.4	21.3	24.7	30.8	15.9	23.3	5.9	10.5	1.1	2.0	0.1	0.2
Percentage of boys	13.1	4.2	17.1	13.6	25.0	25.1	24.0	30.2	14.7	18.4	5.0	7.1	1.1	1.3	0.1	0.1
Percentage of	10.9	1.0	14.7	5.1	23.6	17.5	25.4	31.3	17.1	28.2	7.0	13.9	1.1	2.7	0.1	0.7

Table 4 Percentages of Students at Each Level of Proficiency on Reading Literacy in PISA 2012 Based on Gender

Source: OECD (2013)

The same picture is also for PISA 2012, where a great percentage of Albanian students are in low levels of difficulty. It is 52.3% of Albanian students towards 42.9% of Serbian students that perform below Level 1b-Level 1a. Especially in the lowest level the percentage of Albanian students is very high, 12.0% towards 2.6%. This percentage is greater for boys than girls for both countries. So girls perform better than boys, this is seen also in the high levels of difficulty where the percentage of girls is higher than the percentage of boys. Also in this case boys and girls of Serbia perform better than Albanian one. In PISA 2012 it is a small percentage of Albanian and Serbian students that perform in the highest level, and in this case per percentage of girls for Serbia is higher than the boys. For Albanian students this percentage is equal.

4.2 Mathematical Literacy

In this assessment it is seen a very high percentage of Albanian students in lowest level, 43.5% of boys and 37.3% of girls towards 16.8% of boys and 18.5% of girls in Serbia. Level 1, has approximately the same percentage for both of the countries, and girls has a larger percentage than boys for Albanian and Serbia too. In the other levels of difficulty we have a decrease of the percentage of Albanian students and an increase of Serbian student for both genders. For level 2 and level 3 of difficulty we have that the percentage of boys is lower than the girls' one for both countries, but for level 4 Albanian girls have a greater percentage than boys, but Serbian girls do not. Level 5 has a low percentage of students for both countries, but for both of them the percentage of boys is greater than the girls, more notable is for Serbian students. There is no percentage of Albanian students in level 6, but Serbian students have a low percentage. Also in this level of difficulty boys have a greater percentage, three times greater than the girls one.

Table 5 Percentages of Students at Each Level of Proficiency on Mathematical Literacy in PISA 2009 Based on Gender

	0					•				•				
	Below	level 1	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6	
	(Less	357.77	(357.77-	420.07	(420.07-	482.38	(482.38	8-544.68	(544.68	8-606.99	(606.99	9-669.30	(above	669.30
	points score)		points score)		points so	core)	points score)		points score)		points score)		points score)	
	А	S	А	S	А	S	А	S	А	S	A	S	A	S
Percentage in total	40.5	17.6	27.2	22.9	20.2	26.5	9.1	19.9	2.6	9.5	0.4	2.9	0.0	0.6
Percentage of boys	43.5	16.8	25.5	22.4	18.8	25.4	9.0	19.6	2.6	11.0	0.5	3.9	0.0	0.9
Percentage of girls	37.3	18.5	29.0	23.5	21.6	27.6	9.1	20.3	2.7	8.0	0.3	1.9	0.0	0.3

Source: OECD (2010)

The same picture is also in PISA 2012 like PISA 2009. We see a decrease in the percentage of students in low levels of difficulty and a increase in high levels. Also in this case there are no Albanian students in Level 6, in which Serbian students have a small percentage 1.1%. In this level boys have a larger percentage than girls, 1.5% towards 0.6%. Albanian students are leaded by girls in this domain, where only in level 4, the percentage of boys is greater than girl's percentage. It is not the same situation for Serbia, because in this domain boys lead. This is seen in the highest levels of difficulty, especially in Level 4 and Level 5 of difficulty.

	Below level 1 (Less 357.77 points score)		Level 1 (357.77-420.07 points score)		Level 2 (420.07-482.38 points score)		Level 3 (482.38-544.68 points score)		Level 4 (544.68-606.99 points score)		Level 5 (606.99-669.30 points score)		Level 6 (above 669.30 points score)	
	А	S	А	S	А	S	А	S	А	S	А	S	А	S
Percentage in total	32.5	15.5	28.1	23.4	22.9	26.5	12.0	19.5	3.6	10.5	0.8	3.5	0.0	1.1
Percentage of boys	33.0	14.5	28.0	22.9	22.3	26.7	11.9	19.6	4.0	10.6	0.7	4.3	0.0	1.5
Percentage of girls	32.0	16.5	28.3	24.0	23.6	26.4	12.1	19.4	3.2	10.4	0.8	2.8	0.0	0.6

Table 6 Percentages of Students at Each Level of Proficiency on Mathematical Literacy in PISA 2012 Based on Gender

Source: OECD (2013)

4.3 Scientific Literacy

Also in this domain we have the same phenomena as in reading literacy. If we analyze both of the tables below simultaneously, PISA 2009 and PISA 2012 have almost the same percentage of students in each level of difficulty for both countries. It a small decrease in the percentage of low levels of difficulty and an increase in

high levels of difficulty.

In Table 7, it is seen that in below level 1, level 1, we see a larger performance of boys for both countries. The same situation, but in this case for girls we have in level 2 and level 3. Level 4 have a greater percentage of girls for Albanian students and a greater percentage of boys for Serbian students. Level 5 has a greater percentage of Serbian boys and an equal percentage for Albanian girls and boys. There are no students in level 6 for both countries.

	Below level 1 (Less 357.77 points score)		Level 1 (357.77-420.07 points score)		Level 2 (420.07-482.38 points score)		Level 3 (482.38-544.68 points score)		Level 4 (544.68-606.99 points score)		Level 5 (606.99-669.30 points score)		Level 6 (above 669.30 points score)	
	А	S	А	S	А	S	А	S	А	S	А	S	А	S
Percentage in total	26.3	10.1	31.0	24.3	27.7	33.9	12.9	23.6	2.0	7.1	0.1	1.0	0.0	0.0
Percentage of boys	32.0	10.8	32.0	24.8	24.0	32.7	10.3	22.4	1.6	8.0	0.1	1.2	0.0	0.0
Percentage of girls	20.3	9.4	30.0	23.7	31.5	35.1	15.7	24.8	2.5	6.2	0.1	0.8	0.0	0.0

Table 7 Percentages of Students at Each Level of Proficiency on Scientific Literacy in PISA 2009 Based on Gender

Source: OECD (2010)

In Table 8, there are 0.1% of Serbian students in level 6 in PISA 2012, with an equal percentage between boys and girls. There are no Albanian students in Level 6. Below Level 1, Level 1 and Level 5, the percentage of boys is greater than girls for both countries. In Level 2 and Level 3, girls lead in both countries with small percentage in comparison to boys. Albanian girls lead in Level 4, and Serbian boys lead in this level.

		Below level 1 (Less 334.94 points score)		Level (334.9 points	1 4-409.54 score)	Level 2 (409.54-484.14 points score)		Level 3 (484.14-558.73 points score)		Level 4 (558.73-633. 33 points score)		Level 5 (633.33-707.9 3 points score)		Level 6 (above 707.93 points score)	
		А	S	А	S	А	S	А	S	A	S	А	S	A	S
Percentage total	in	23.5	10.3	29.6	24.7	28.5	32.4	14.4	22.8	3.6	8.1	0.4	1.6	0.0	0.1
Percentage boys	of	24.7	11.1	30.7	25.7	27.2	31.1	13.7	21.9	3.1	8.3	0.4	1.7	0.0	0.1
Percentage girls	of	22.3	9.6	28.3	23.7	29.9	33.6	15.1	23.7	4.0	7.9	0.3	1.5	0.0	0.1

Table 8 Percentages of Students at Each Level of Proficiency on Scientific Literacy in PISA 2012 Based on Gender

Source: OECD (2013)

Table 9 gives which summarizes the situations discussed above. It is shown better this difference between boys and girls performance for both of the countries. In the case that the difference is positive, boys lead it but when the difference is negative girls lead it. Let study these differences in both assessments in relation to Serbian and Albanian students.

Reading Literacy: from the table it is seen that in this domain the difference is negative for both countries and in both assessments, which means that girls perform better than boys in this domain. It is seen that this difference is the biggest for Albanian students in PISA 2009 and the lowest one PISA 2012 for Albanian students. in these two assessments it is seen a great decrease in the absolute value, but for Serbian students it is seen a increase in the absolute value, that means that the performance of girls have increased.

		PISA	2009	PISA 2	012
		Albania	Serbia	Albania	Serbia
	Boys	355	422	387	423
Reading Literacy	Girls	417	462	401	469
	Difference	-62	-39	-15	-46
	Boys	372	448	394	453
Mathematics Literacy	Girls	383	437	395	444
Enteracy	Difference	-11	12	-1	9
	Boys	377	442	394	443
Scientific Literacy	Girls	406	443	401	447
	Difference	-29	-1	-7	-4

 Table 9
 An Overview of Boys and Girls in Three Domains in PISA 2009 and PISA 2012

Source: OECD (2010) and OECD (2014)

Mathematics Literacy: in this domain we do not have the same situation for both countries, because as it is seen from the table Albanian students' performance has a negative difference, which means that girls lead in both of the assessments. Since this difference has decreased in absolute value, it means that the girls' performance has decreased in years. This is not the same for the Serbian students because the difference for both of the assessment is positive, which means that Serbian boys perform better than Serbian girls in this domain. The value of this difference has decrease, which means that boys' performance in PISA 2012 is worse than in PISA 2009.

Scientific Literacy: the picture in this domain is similar with the reading domain but the differences are smaller than in reading literacy. The greatest difference in absolute value is for Albanian students in PISA 2009, and the smallest one is for Serbian students in the same assessment. From this table we can see that Albanian boys' performance has improved, but not the Serbian boys' performance which has decreased.

5. Discussion and Conclusion

This research has made a comparison between two countries for their performance based in gender ratio. It is seen that Albanian girls perform better than boys in all the three domains in both assessments. The biggest difference in absolute value is in PISA 2009 in reading literacy, and the smallest one is mathematics literacy in PISA 2012. Serbian girls perform better in reading literacy and scientific literacy in both assessments. Serbian boys perform better than girls in mathematics literacy.

From Table 9, it is seen that girls of both the countries lead with their performance in both assessments.

But still both of the countries are not performing well in comparison with other participating countries, especially Albania. This is related with economic situation in which each of the countries. It is needed to look more to the environment in which students live.

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