

## **PISA Assessment in 2009 and 2012: A Comparison between Albanian Students' Performance and the Croatian One. A Case Study**

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### **Abstract**

PISA (Program for International Student Assessment) is an international assessment for students at age of 15 years old of 65 different countries. This assessment compares not only students' performance of all participant countries in mathematics domain, scientific domain and literacy domain but also their conscience about school, their thinking and feeling. There are also data from their parents background and administers of their schools. PISA does not tell which curriculum is the best and which one is the worst but it gives a general overview of the students' performance for each participant country.

In this article it is chosen to compare students of Albania and Croatia based on their performances published by OECD. The data are taken from PISA 2009 and PISA 2012 because in these assessments both of the countries have taken part simultaneously. It is a general overview of their performances based on gender ratio.

The method of this article is based on the data published by OECD. This article is a comparison one, comparing Albanian students with the Croatian one. Which of them perform better than the other? Do girls perform better or worse than boys in Albania? And how is the gender ratio for the Croatian students?

In conclusion of this research is that both of the countries have an increase of the students' performance from PISA 2009 and PISA 2012. Albanian students' performance has a greater increase through years in comparison to Croatian students. This increase is more notable in mathematics domain and not so notable in science and literacy domain for both countries. It is also seen that students from Croatia perform better than the Albanian one and the difference of the students' performance for both of the countries is notable. Albanian girls perform better than boys in each domain. In mathematical domain Croatian boys perform better than girls, but in the other domains girls' performance lead.

**KEYWORDS-** PISA assessment, comparison study, gender ratio, students' performance

### **INTRODUCTION**

PISA (Program for International Student Assessment) has started an assessment developed by OECD to compare the curricula of participant countries. (OECD/UNESCO-UIS, 2003) The number of countries that took part in this assessment through years has changed. There were 65 countries that took part in PISA 2012. PISA started in 2000, and it is repeated every three years. It assesses the students in three domains: reading literacy, mathematical literacy and scientific literacy. (OECD/UNESCO-UIS, 2003) PISA 2000 had in focus reading literacy, and the other two domains secondly in focus. In PISA 2003 it was mathematics in focus and the other two domains secondly in focus and so on.

Since the number of member countries that take part in this assessment differ, also Albania and Croatia the ones that are taken in focus in this research did not took part in

each PISA. Albania has taken part in PISA 2000, PISA 2009 and in PISA 2012. Croatia has taken part in PISA 2006, PISA 2009 and PISA 2012. I have taken in consideration for this article the assessments PISA 2009 and PISA 2012, since both of the countries has taken part simultaneously.

Below we will give the results taken by OECD publications through years in relation to students' performances for Albania and Croatia.

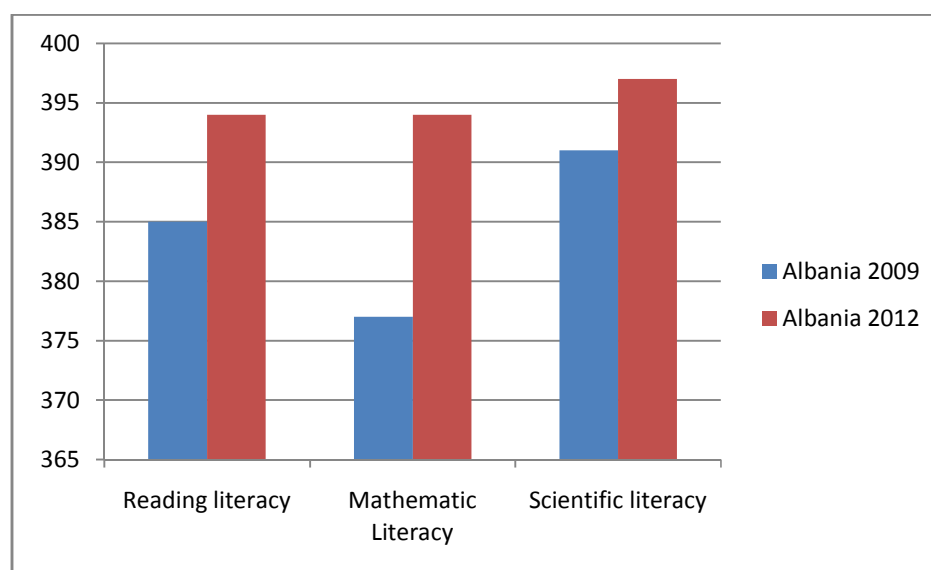
Table 1. The results (mean score) taken by Albanian and Croatian students and their differences in three domains in PISA 2009 and PISA 2012.

Nr.	Domain	PISA 2009			PISA 2012		
		Albania	Croatia	Diff.	Albania	Croatia	Diff.
1.	Reading literacy	385	476	91	394	485	91
2.	Mathematic literacy	377	460	83	394	471	77
3.	Science literacy	391	486	95	397	491	94

Source: OECD (2010), OECD (2014)

This table contains the results in mean score of the students' performance through years for Albania and Croatia.

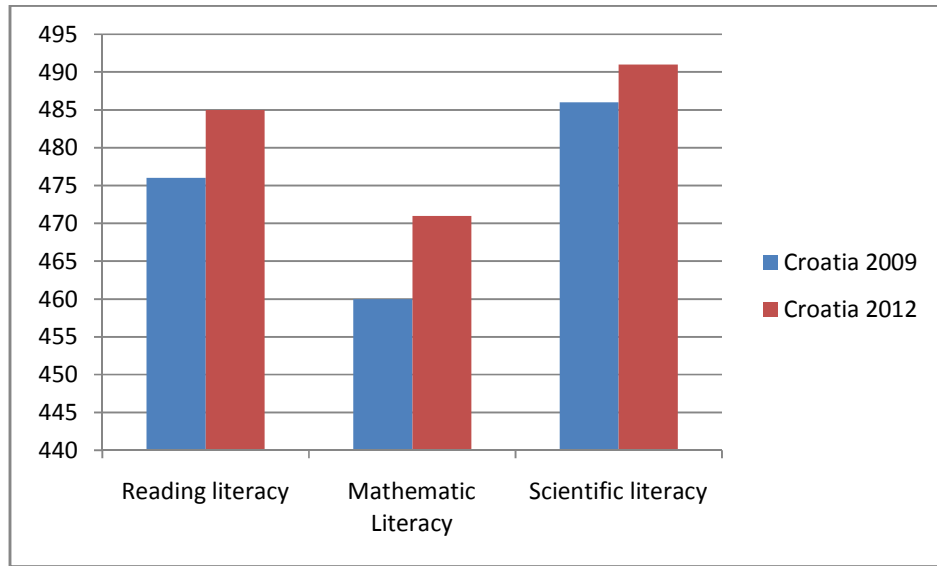
There are three graphs that correspond to Table 1.



Graph 1. Mean score of Albanian students' performance in three domains in PISA 2009 and PISA 2012.

Source: OECD (2010), OECD (2014)

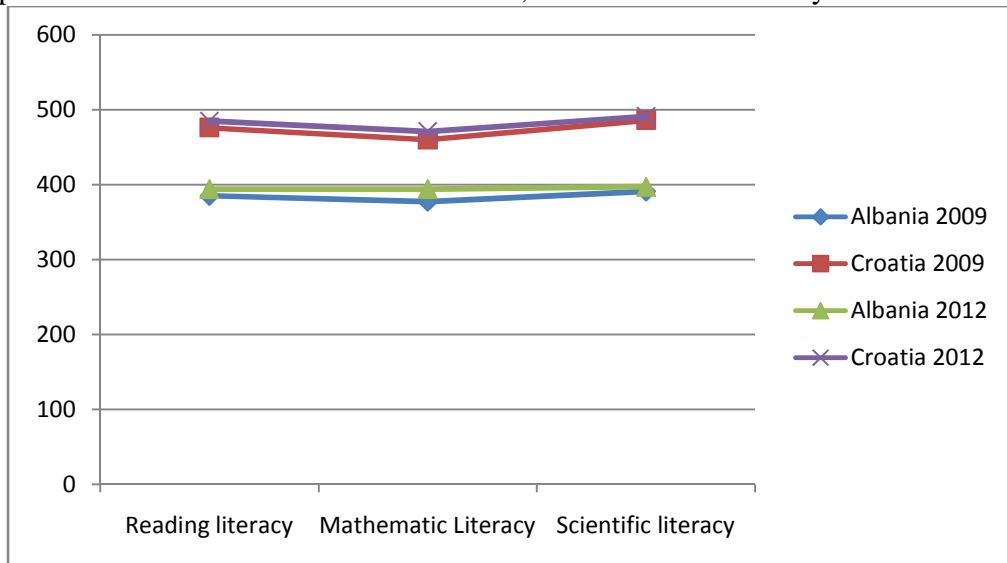
Albanian students' performance has grown in the last two assessments. The growth is notable especially in mathematics domain where the difference is greater than in other domains. The greatest achievement of these students is in scientific literacy with 397 points. The lowest achievement of these students is in mathematics literacy in PISA 2009 with 377 points.



Graph 2. Mean score of Croatian students' performance in three domains in PISA 2009 and PISA 2012.

Source: OECD (2010), OECD (2014)

Croatian students' performance has increased, where the greatest growth is in mathematics literacy and the lowest growth of the students is for scientific literacy. The best achievement of the Croatian students is in scientific literacy in PISA 2012 with 491 points and the lowest one is in PISA 2009, in mathematics literacy.



Graph 3. Albanian and Croatian students' performances in PISA 2009 and PISA 2012.

Source: OECD (2010), OECD (2014)

It is seen from the graph above that the points of Croatian students is higher than the Albanian ones, and this difference is notable. The highest difference between these countries is in PISA 2009 in science by 95 points in mean score, and the lowest one is in PISA 2012 in mathematical domain by 77 points in mean score.

## MATERIAL AND METHODS USED FROM PISA ASSESSMENT

The data used in this article are taken from the OECD publishing. The number of countries that take part in this assessment has changed in years. There were 65 countries enrolled in this assessment in PISA 2009 and PISA 2012, between them there were also Albania and Croatia (OECD, 2010 and OECD, 2014). All the students of participating countries are between 15 years and 3 months to 16 years 2 months (OECD, 2014) and they are posed to a paper-based test that lasts 2 hours. In the test is a mixture of questions based in the three domains. The greater number of the questions is taken from the main domain taken in focus. All the questions of the test are taken from real-life situation, which is also the aim of this assessment: are our students able to put their knowledge in their real-life situations?

The questions are an open question or with multiple choice. These students are also posed to a questioner, which takes 30 min to complete. Questioner has topic in relation to students feeling and beliefs to school environment and their parents' background. It is also the questioner of the principal of the school to fill in, which also takes 30 min to complete.

## RESULTS AND DISCUSSION

This section is divided into three based on the domains taken in study. There are described all the results taken from Albanian and Croatian students' performance in years. All the taken data are based in the OECD publishing about PISA assessment. Below are given the tables that give the percentages of Albanian and Croatian students in levels of difficulty, in the three domains for both the assessments taken in consideration. There are taken in consideration also the gender ratio for each domain.

### *-Reading Literacy*

The evaluation of reading literacy is divided in eight levels of difficulty in both assessments. First level of difficulty is for the students that have not taken more than 262.04 points and the higher level of difficulty is for the students that have taken more than 698.32 points score. These tables give the percentages of Albanian and Croatian students for each of these levels of difficulty for both assessment PISA 2009 and PISA 2012.

Table 2. Percentages of Albanian and Croatian students at each level of proficiency on reading literacy in PISA 2009 based in gender ratio.

	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)
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Percentage in total	Al <sup>1</sup>	11.3%	18.7%	26.6%	25.6%	14.4%	3.1%	0.2%	0.0%
	Cr <sup>2</sup>	1.0%	5.0%	16.5%	27.4%	30.6%	16.4%	3.1%	0.1%
Percentage of boys	Al	17.5%	24.4%	27.2%	19.7%	9.7%	1.5%	0.0%	0.0%
	Cr	1.7%	7.9%	21.7%	29.9%	26.0%	11.5%	1.4%	0.0%
Percentage of girls	Al	4.9%	12.8%	26.0%	31.9%	19.4%	4.8%	0.3%	0.0%
	Cr	0.2%	1.8%	10.6%	24.6%	35.7%	22.0%	4.9%	0.2%

Source: OECD (2010)

From the data of Table 2, it is seen that Albanian students perform worse than Croatian students. The percentage of Albanian students in the lowest levels of difficulty is higher than the Croatian ones. This difference is more notable for the lowest level of difficulty and the Level 1b. A great difference is noticed also in the higher levels of difficulty, especially in Level 4 and Level 5 of difficulty. In Level 6 of difficulty this difference is the lowest. The same situation it is seen also in the percentage of boys and girls in both countries; a large performance of Albanian students in lowest levels and a low percentage of them in high levels of difficulty. From the results it is seen that Albanian and Croatian girls have perform better than boys in reading literacy in PISA 2009, since their percentage is lower in the lowest levels of difficulty and higher in the highest levels of difficulty compared with the percentage of the boys.

Table 3. Percentages of Albanian and Croatian students at each level of proficiency on reading literacy in PISA 2012 based in gender ratio.

		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)
Percentage in total	Al	12.0%	15.9%	24.4%	24.7%	15.9%	5.9%	1.1%	0.1%
	Cr	0.7%	4.0%	13.9%	27.8%	31.2%	17.8%	4.2%	0.2%
Percentage of boys	Al	13.1%	17.1%	25.0%	24.0%	14.7%	5.0%	1.1%	0.1%
	Cr	1.4%	6.3%	19.9%	30.1%	26.9%	12.7%	2.6%	0.1%
Percentage of girls	Al	10.9%	14.7%	23.6%	25.4%	17.1%	7.0%	1.1%	0.1%
	Cr	0.1%	1.6%	7.8%	25.5%	35.7%	23.2%	5.8%	0.4%

Source: OECD (2014)

Also in this case the data are similar with the table above; a great percentage of the Albanian students in low levels (below level 1b-level 1a) in comparison with the percentages of Croatian students. In this assessment girls perform better than boys for both the countries because the percentage of girls is lower in the low levels and higher in high levels of difficulty that the percentage of boys for both countries.

The panorama in the reading literacy in both the assessment for Albania and Croatia is almost the same; the percentages in the respective levels do not differ with a notable difference.

<sup>1</sup> Albania

<sup>2</sup> Croatia

***-Mathematical Literacy***

The evaluation of mathematical literacy is divided in seven levels of difficulty in both assessments. First level of difficulty is for the students that have taken less than 357.77 points score and the higher level of difficulty is for the students that have taken more than 669.30 points score. These tables give the percentages of Albanian and Croatian students for each of these levels of difficulty for both assessment PISA 2009 and PISA 2012.

Table 4. Percentages of Albanian and Croatian students at each level of proficiency on mathematical literacy in PISA 2009 based in gender ratio.

		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)
Percentage in total	Al	40.5%	27.2%	20.2%	9.1%	2.6%	0.4%	0.0%
	Cr	12.4%	20.8%	26.7%	22.7%	12.5%	4.3%	0.6%
Percentage of boys	Al	43.5%	25.5%	18.8%	9.0%	2.6%	0.5%	0.0%
	Cr	11.6%	20.2%	25.7%	22.7%	13.6%	5.3%	0.8%
Percentage of girls	Al	37.3%	29.0%	21.6%	9.1%	2.7%	0.3%	0.0%
	Cr	13.2%	21.4%	27.9%	22.6%	11.2%	3.2%	0.4%

Source: OECD (2010)

The same picture is also for the mathematical literacy, a higher percentage of Albanian students in low levels of difficulty and a lower percentage of them in comparison with Croatian students. Something that is different from the previous panorama in reading domain is the large percentage of Albanian students in the two lowest levels (below Level 1 and Level 1) of difficulty, where this percentage is 67.2% of the students, quite different from the Croatian students that are less than 33.2%. A large percentage in the lowest levels is from the Albanian boys, which are 69% in two lowest levels. Albanian girls perform better than the boys. It is seen that Croatian boys perform better than girls since boys have lower percentage in low levels and higher percentage in high levels of difficulty in comparison with Croatian girls.

Table 5. Percentages of Albanian and Croatian students at each level of proficiency on mathematical literacy in PISA 2012 based in gender ratio.

		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)
Percentage in total	Al	32.5%	28.1%	22.9%	12.0%	3.6%	0.8%	0.0%
	Cr	9.5%	20.4%	26.7%	22.9%	13.5%	5.4%	1.6%
Percentage of boys	Al	33.0%	28.0%	22.3%	11.9%	4.0%	0.7%	0.0%
	Cr	9.3%	19.5%	25.2%	22.7%	14.5%	6.5%	2.2%

Percentage of girls	Al	32.0%	28.3%	23.6%	12.1%	3.2%	0.8%	0.0%
	Cr	9.7%	21.3%	28.2%	23.2%	12.4	4.2%	1.0%

Source: OECD (2014)

The same panorama is also for Table 5 as Table 4. Also in this case Albanian girls perform better than boys and it is the opposite for the Croatian students where the boys lead in this domain. It is seen that the difference of the percentages between Albanian girls and boys in this table are approximately the same and these differences are not very notable, in comparison with Table 4. It is the same for the Croatian students, with the only difference, a higher percentage of boys in high levels of difficulty and a low percentage of them in low levels of difficulty in comparison with girls.

**-Scientific Literacy**

The evaluation of scientific literacy is divided in eight levels of difficulty in both assessments. First level of difficulty is for the students that have taken less than 357.77 points and the higher level of difficulty is for the students that have taken more than 669.30 points score. These tables give the percentages of Albanian and Croatian students for each of these levels of difficulty for both assessment PISA 2009 and PISA 2012.

Table 6. Percentages of Albanian and Croatian students at each level of proficiency on scientific literacy in PISA 2009 based in gender ratio.

		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)
Percentage in total	Al	26.3%	31.0%	27.7%	12.9%	2.0%	0.1%	0.0%
	Cr	3.6%	14.9%	30.0%	31.1%	16.7%	3.5%	0.2%
Percentage of boys	Al	32.0%	32.0%	24.0%	10.3%	1.6%	0.1%	0.0%
	Cr	4.4%	16.1%	30.3%	29.2%	16.4%	3.4%	0.2%
Percentage of girls	Al	20.3%	30.0%	31.5%	15.7%	2.5%	0.1%	0.0%
	Cr	2.7%	13.6%	29.7%	33.2%	17.1%	3.6%	0.2%

Source: OECD (2010)

Table 6 shows the same situation as in Table 2 and Table 3; girls perform better than boys because girls have lower percentages in lower levels of difficulty and higher percentages in top levels of difficulty than boys for both countries. But still it is a great difference between the percentages of Albanian students with the Croatian ones; especially this difference is mostly seen in the lowest level of difficulty and in Level 4 and Level 5 of difficulty.

Table 7. Percentages of Albanian and Croatian students at each level of proficiency on scientific literacy in PISA 2012 based in gender ratio.

		Below level 1 (Less 334.94 points)	Level 1 (334.94-409.54 points)	Level 2 (409.54-484.14 points)	Level 3 (484.14-558.73 points)	Level 4 (558.73-633.33 points)	Level 5 (633.33-707.93 points)	Level 6 (above 707.93 points)
Percentage in total	Al	26.3%	31.0%	27.7%	12.9%	2.0%	0.1%	0.0%
	Cr	3.6%	14.9%	30.0%	31.1%	16.7%	3.5%	0.2%
Percentage of boys	Al	32.0%	32.0%	24.0%	10.3%	1.6%	0.1%	0.0%
	Cr	4.4%	16.1%	30.3%	29.2%	16.4%	3.4%	0.2%
Percentage of girls	Al	20.3%	30.0%	31.5%	15.7%	2.5%	0.1%	0.0%
	Cr	2.7%	13.6%	29.7%	33.2%	17.1%	3.6%	0.2%

		points score)	score)	score)	score)	score)	score)	score)
Percentage in total	Al	23.5%	29.6%	28.5%	14.4%	3.6%	0.4%	0.0%
	Cr	3.2%	14.0%	29.1%	31.4%	17.6%	4.3%	0.3%
Percentage of boys	Al	24.7%	30.7%	27.2%	13.7%	3.1%	0.4%	0.0%
	Cr	3.9%	15.6%	27.6%	29.3%	18.4%	4.8%	0.5%
Percentage of girls	Al	22.3%	28.3%	29.9%	15.1%	4.0%	0.3%	0.0%
	Cr	2.6%	12.5%	30.6%	33.7%	16.8%	3.7%	0.2%

Source: OECD (2014)

The same situation it is also in Table 7 as in Table 6. It is seen a higher percentage in low levels of Albanian students and a low percentage in high levels of them in comparison with Croatian students. The same difference between levels is founded also in the gender performances for both countries. Also in this domain girls perform better than boys in both countries.

Tabela 8. An overview of Albanian and Croatian students' performance in three domains in years given by mean score based in gender ratio.

PISA	Country	Gender	Reading literacy	Mathematical literacy	Science literacy
PISA 2009	Albania	Boys	355	372	377
		Girls	417	383	406
		Difference (B-G)	-62	-11	-29
	Croatia	Boys	452	465	482
		Girls	503	454	491
		Difference (B-G)	-51	11	-9
PISA 2012	Albania	Boys	387	394	394
		Girls	401	395	401
		Difference (B-G)	-15	-1	-7
	Croatia	Boys	461	477	490
		Girls	509	465	493
		Difference (B-G)	-48	12	-3

Source: OECD (2010), OECD (2014)

This table is a summary of the tables above. It gives an overview of the students' performance in both countries in the three domains based on gender ratio. It is seen an increase of the mean score for both the countries in years in each domain. It is also shown difference between boys and girls performances. Mostly in each case, Albanian girls perform better than boys but not with the same differences. The greatest difference is for Albanian students in reading literacy (PISA 2009) with 62 points mean score. The lowest difference between boys and girls is in PISA 2012 in mathematic domain for Albanian students. It is seen from the fact that the difference between these performances has a



negative value. Croatian students perform better than Albanian students. This difference is notable. Based on the table above it is seen that two differences are positive in the mathematical domain for Croatian. This means that in mathematic domain Croatian boys perform better than Croatian girls in PISA 2009 and PISA 2012.

## CONCLUSION

In this overview of Albanian and Croatian students' performance it is concluded that Croatian students perform better than the Albanian students according to the results in PISA 2009 and PISA 2012. This difference between the students performance of two countries is notable. This is seen especially from Graph.1 where the lines of the graph for both evaluations of Croatian students differ from the lines of Albanian students. This means that they differ by one level of difficulty, and this difference is in all the three domains taken in consideration.

Based on gender ratio, it is seen that Albanian girls perform better than boys in each domain in PISA 2009 and PISA 2012. Also Croatian girls perform better than boys in reading literacy and scientific literacy in both the assessments, but in mathematical literacy Croatian boys lead with their performances.

This means that in general Albanian and Croatian girls perform better than boys. This difference is higher especially in reading literacy.

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