



DOES SOCIOECONOMIC STATUS INFLUENCE ACHIEVEMENT? AN ANALYSIS OF THE PERFORMANCE OF KOSOVAR STUDENTS ON THE 2015 AND 2018 PISA ASSESSMENT

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Abstract/Izveček Socioeconomic status has long been considered an influential factor in student achievement. Similar to existing literature, results of this analysis reveal that socioeconomic status influenced student achievement in the 2015 and 2018 PISA assessments. However, the achievement gap between categories widened between 2015 and 2018. Results reveal that home possessions, school location, parental education played a role in achievement. Furthermore, students who attended private schools outperformed students in public schools, a gap that widened considerably between assessments. Results of the current analysis reveal the importance of socioeconomic factors in achievement and, the need for policy builders to mitigate this impact.

Ali socioekonomski status vpliva na dosežke? Analiza uspešnosti kosovskih učencev pri ocenjevanju znanja PISA 2015 in 2018

Socialnoekonomski status je dolgo veljal za vpliven dejavnik pri uspehu študentov. Podobno kot v obstoječi literaturi tudi rezultati te analize kažejo, da je socialnoekonomski status vplival na uspehe učencev pri ocenjevanjih PISA v letih 2015 in 2018. Vendar pa se je razlika v dosežkih med kategorijami med letoma 2015 in 2018 povečala. Rezultati kažejo, da so imeli vlogo pri dosežkih lastnina doma, lokacija šole, izobrazba staršev. Poleg tega so učenci, ki so obiskovali zasebne šole, prekašali učence v javnih šolah, pri čemer se je razlika med ocenami znatno povečala. Rezultati trenutne analize razkrivajo pomen socialno-ekonomskih dejavnikov pri doseganju in potrebo, da oblikovalci politike ublažijo ta vpliv.

Ključne besede:

socioekonomski status,
dosežki učencev, PISA
Kosovo.

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Introduction

Understanding what influences learning is among the main topics of research in education science. In responding to this issue, familial socioeconomic status is a factor often researched to explain differences in learning and achievement (Sirin, 2005). Socioeconomic status has been widely researched on the premise that it shapes performance and achievement. Literature has continuously reported support for a link between educational attainment and the socioeconomic status of students (Noel and de Broucker, 2001; Organisation for Economic Co-operation and Development [OECD], 2004). Evidently, the correlation between the two variables is a positive one, indicating that the higher the socioeconomic status of a student, the higher the educational attainment (Perry, 2010). According to Haveman and Wolfe (1984), familial socioeconomic standing influences learning and achievement; more specifically, as socioeconomic standing increases, so does the performance and learning of the student. In the literature, socioeconomic status is thus considered an important factor shaping achievement (Caponera and Losito, 2016). To elaborate, students who had better educated parents and more home possessions performed the highest in mathematics (Clements and Sarama, 2009; Topcu, Erbilgin, and Arikan, 2011).

Considering the undeniable link between socioeconomic status and achievement, international assessment tests such as PISA have assessed both variables in an attempt to explore the link between the two. The Programme for International Student Assessment (PISA) is a cooperative project between the Organization for Economic Co-operation and Development (OECD) and member countries, the aim of which is to test the achievement of students in reading literacy, mathematics and science (Entorf and Minoi, 2004). Over the years, the number of countries participating in PISA has increased. A minimum of 4500 students from 150 schools participates in the assessment (Krawchuk and Rust, 2002). This assessment is particularly important for developing economies such as Kosovo, for which PISA remains the one and only assessment project to provide information on student learning and achievement. So far, Kosovo has participated in only two assessments: 2015 and 2018. The achievement of Kosovar students has been low, but PISA data provide valuable information on the link between achievement and socioeconomic status.

The current analysis explores the impact of SES indicators, parental education and home possessions, on student achievement in mathematics, science and reading literacy. The results reveal that higher socioeconomic status is linked to higher achievement among Kosovar students. Additionally, school location and school type also influenced performance. More specifically, students in private schools performed better compared to students in public schools, while students attending schools in villages and small towns performed more poorly in comparison to students attending city schools. The trends remained the same in 2015 and 2018; however, the achievement gap widened considerably between assessments.

Literature review

Socio-economic status (SES) determines educational achievement as much as it influences the development and health of children (Schulz, 2005), with socioeconomic standing correlating to social and emotional wellbeing as well as cognitive outcomes (Bradley and Corwyn, 2002). Educational achievement and performance have always been shown to reflect the family background of a given student. To elaborate, parents with high socioeconomic status have more financial resources to support the learning of their children. These parents also offer a home environment that promotes learning and cognitive development (Schulz, 2005).

Socioeconomic status is composed of three main variables: occupation, education level and income of parents (Hauser, 1994); in the literature, these variables are used together and not separately to analyze socioeconomic status (Entwisle and Astone, 1994; Hauser, 1994). Similarly, in international assessment, socioeconomic standing is assessed through these variables: parental education, parental occupation and household items (Schulz, 2005). The PISA data have continuously provided evidence that measuring socioeconomic status is important, first, to account for gaps in the equity of education systems and, secondly, to explore how SES links to other characteristics in an education system when influencing achievement and performance (Schulz, 2005). Household possession scales have proven to be important family variables, and in the PISA assessment they have been valuable in explaining differences in achievement when parental education and occupation have failed to do so (Schulz, 2005).

The 2015 PISA assessment revealed that students from lower SES backgrounds were three times more likely to fail in achieving basic competences in reading literacy, mathematics and science, compared to students who came from higher SES backgrounds (OECD, 2016). The OECD report (2016) notes that the background of students impacted the benefits students could receive from education. Other studies have also reported that as the familial SES increases, so does achievement and learning (Boocock, 1972), and familial SES is a greater influencer of education, earnings and professional career than IQ (Bowles and Nelson, 1974).

Analysis across countries shows that students with high SES families performed better on the PISA assessments compared to students from low SES families. Although the effect changes from country to country, the trend remains the same. In the German education system, for example, students with low socioeconomic standing who also happened to have a minority background performed the worst (Entorf & Minoi, 2004).

Parental education is a variable that influences performance on PISA assessments; more specifically, the education of fathers was a powerful predicting variable for the performance of Turkish students (Anil, 2009). The results conducted on the PISA assessment data reveal that learning and achievement are shaped by indicators of familial socioeconomic status such as parents' education level and household possessions, including but not limited to rooms, study desks, internet, books and computers (Mullis, Martin, Ruddock, O'Sullivan, and Preuschoff, 2009). Consequently, the argument that improving familial socioeconomic status will lead to an increase in achievement is often embraced (Güven, 2019). According to existing studies, familial socioeconomic status explains 20% of student achievement, while homework explains only 1% (Güven, 2017). Furthermore, according to the OECD analysis of 2016, the student's socio-economic status explained 12.9% of student performance.

While there are many research studies supporting the argument that familial socioeconomic status influences student learning, the reality is that the link between the variables is still questioned by many researchers. Accordingly, Sirin (2005) notes that the link between familial socioeconomic status and achievement is of medium strength. Similarly, Letourneau, Duffett-Leger, Levac, Watson, and Young (2013) maintain that the variables are only weakly linked.

The underlying argument is that just because socioeconomic status and educational achievement are linked, this should not encourage policy builders to think that the relationship is detrimental—that it is proof of socioeconomic status determining learning and achievement. Arguing that students do better when they have educated parents who are wealthy, is not the same as the imperative that these students do better exclusively because they have such parents. This argument neglects the impact of cognitive abilities, which strongly influence learning and achievement (Deary, Strand, Smith, and Fernandes, 2007; Roth et al., 2015). Evidently, the link between socioeconomic status and student achievement is still debated among researchers. Considering the existing literature, the current paper aims to explore the link between socioeconomic status and the achievement of Kosovar students on PISA. The results focus on the impact of variables such as school location, school type and parental education, on one hand, and household possessions, on the other, as measures of familial socioeconomic status, on student performance in reading literacy, mathematics and science.

Methodology

Current research makes use of the PISA Data Explorer available on the website of the Organization for Economic Co-operation and Development (OECD PISA Explorer, 2015; OECD PISA Explorer, 2018). The online dataset provides information on all variables for all countries participating in the PISA assessment. For this publication, only the data for Kosovo were analyzed. In 2018, 5058 students from 224 schools participated in the assessment, representing 25,739 students at the age of 15 in Kosovo. The 2015 PISA assessment had a smaller number of participants: 4,826 students participated, representing 31,546 students across the country. The data explorer allows researchers to conduct several statistical procedures, such as T-tests and Anova and obtain p-values. The analyses were done in the PISA data explorer, which enables researchers to select variables and conduct tests on their relation to the PISA results. The study used four variables: school location, school type, parental education and household possessions. The hypotheses of this study are built on the existing literature.

Therefore, we expect to find a significant positive correlation between student performance in reading literacy, mathematics and science, on one hand, and socioeconomic variables, on the other. Furthermore, the study aims to explore whether trends are consistent across PISA assessments in 2015 and 2018.

H1. There is a significant positive correlation between maternal education and student performance on PISA.

H2. There is a significant positive correlation between paternal education and student performance on PISA.

H3. There is a significant positive correlation between household possessions and student performance on PISA.

H4. Students attending city schools will outperform students attending schools in small towns and villages.

H5. Students attending private schools will outperform students attending public schools.

H6. The impact of parental education and household possessions on student performance on the PISA assessment is consistent across assessment years (2015, 2018).

Results

The current analysis relied on data made available by the OECD. The figure below provides information on the performance of Kosovar students on the PISA assessment for 2015 and 2018. In 2015 there was an increase of 6 points which was not a significant difference in reading literacy. Similarly, in mathematics, an increase of 6 points was observed, but this increase was not significant. Finally, in 2018, students performed worse in science compared to 2015, a difference of 13 points, which was significant at $p < 0.05$.

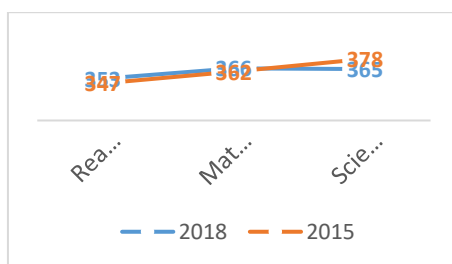


Figure 1: Student performance on PISA 2015 and 2018.

One variable that was linked to achievement in both 2015 and 2018 was school type. Across all domains and both years, students in private schools outperformed students in public schools.

The differences were significant, and the achievement gap increased from 2015 to 2018, by 49 points in reading literacy, 38 points in mathematics, and 35 points in science. In the 2018 assessments, students in private schools outperformed students in public schools by 94 points in reading literacy, 96 points in mathematics and 96 points in science; all the differences were significant at $p < 0.01$ (see Table 1 below). Similar to school type, there was also a relationship between school location and student achievement. More specifically, students in cities outperformed students in other areas in both assessment years and all domains (see Table 1 below). The least performing students were those whose school was located in a village, followed by students who attended school in small towns, and those who attended school in towns. In terms of the impact of parental education, the data shows that in both years, students performed better in all domains when the parents had secondary or tertiary education. Students who had the lowest levels of achievement had parents who had completed primary education or whose parents had not even completed primary education

Table 1: PISA results according to year, school type, school location, and parental education.

	Reading literacy			Mathematics			Science						
	2018	SE	2015	SE	2018	SE	2015	SE	2015	SE			
Type	Private	447	1.2	398	1.4	464	10.6	426	14.3	460	9.3	425	13.5
	Public	353	6.6	346	11.7	365	1.6	360	1.5	364	1.3	377	1.6
Location	Village	329	4.4	320	5.1	343	5.2	339	4.1	348	4.1	356	4.3
	Small town	338	3.8	333	3.7	353	4.9	350	3.9	350	3.6	367	3.2
	Town	352	1.5	348	2.2	363	2.0	363	2.1	362	1.7	380	2.2
	City	378	2.7	370	3.3	392	2.9	378	3.5	389	2.5	395	3.2
Education level Mother	No primary education	319	8.8	315	11.7	343	10.0	329	11.3	343	9.1	352	9.5
	Primary Edu.	338	3.5	328	4.8	352	4.1	335	5.3	346	3.5	363	3.8
	Lower second.	355	2.1	345	2.6	367	2.5	359	2.9	370	2.0	376	2.9
	Second. education	349	2.5	353	4.0	362	3.2	370	3.5	363	2.6	384	3.5
	Tertiary education	362	1.8	359	2.4	375	2.4	374	2.7	371	2.0	389	2.4
	No primary education	279	10.7	283	16.5	313	14.2	311	19.6	311	12.3	342	15.7
Education level Father	Primary Edu.	318	4.2	304	5.9	333	5.6	318	7.0	323	3.3	350	5.3
	Lower second.	334	2.7	315	4.3	344	3.3	332	4.3	353	3.0	350	3.8
	Second. education	360	2.0	346	2.8	373	2.4	379	2.8	371	1.9	393	2.7
	Tertiary education	362	1.6	353	2.3	375	2.2	366	2.5	373	1.9	382	2.2

Table 2 presents the link between household possessions and achievement on PISA. The data shows that having a room of their own is not positively linked to the performance of students on PISA; the trend was similar in both years. Having internet access, on the other hand, was linked to achievement on the PISA scales, since students who had internet access outperformed those who did not. The achievement gap in both years was larger for mathematics and science, with 44 and 36 points in 2018 and 43 and 33 points in 2015. A quiet place to study was also linked to student achievement in both years, since students who had such a place to study performed better in all domains than students who did not have such a place (see Table 2 below). The possession of a desk was also linked to student achievement, since students who had a desk for study outperformed those who did not in 2018 by 1 point in reading literacy, 20 points in mathematics and 30 points in science (see Table 2 below). On the other hand, in the 2015 PISA assessment, students who had a desk for study performed better than students who did not, by 11 points in reading literacy, 42 points in mathematics and 38 points in science. Apart from the difference in reading literacy in the 2018 assessment ($p > 0.05$), all other differences were significant $p < 0.01$. Additionally, students who had a computer to use for school work also performed better than those who did not have such a computer, in both years and across all domains.

Table 2: PISA performance across years according to household possessions.

	Reading literacy		Mathematics		Science								
	2018	SE	2015	SE	2018	SE	2015	SE					
A room of your own	Yes	355	1.1	362	1.6	367	1.6	363	1.7	366	1.3	379	1.7
	No	349	4.9	365	5.5	382	5.9	374	6.4	380	5.1	393	6.0
A link to the Internet	Yes	358	1.2	324	1.5	371	1.6	368	1.7	370	1.2	384	1.8
	No	353	3.5	317	5.5	327	4.8	325	5.8	334	3.5	351	4.8
A quiet place to study	Yes	356	1.1	337	1.4	369	1.5	365	1.7	368	1.2	382	1.7
	No	351	5.9	332	8.2	358	6.4	350	7.6	353	5.9	365	8.5
A desk for study	Yes	365	1.3	328	1.6	367	1.6	377	2.0	375	1.2	392	1.8
	No	364	2.7	317	3.3	347	3.2	335	2.9	345	2.8	354	3.3
A computer	Yes	358	1.3	345	1.5	371	1.4	367	1.7	370	1.3	383	1.8
	No	353	2.6	328	5.6	355	3.7	344	4.4	356	2.7	363	4.1
Cell phones at home	None	310	4.6	305	5.1	318	5.7	323	5.0	327	4.3	341	4.0
	one	329	2.1	322	3.4	337	2.8	335	3.8	340	2.5	360	3.3
	two	337	3.6	352	3.6	349	5.0	361	3.4	355	3.7	380	3.0
	three or more	371	1.3	368	1.9	386	1.9	384	1.9	382	1.6	395	2.1
Computers at home	None	333	3.0	316	5.1	343	3.9	332	4.6	347	2.7	353	4.2
	one	351	1.5	348	2.3	361	1.9	362	2.2	361	1.7	378	2.4
	two	372	2.3	366	2.9	390	3.3	375	3.3	385	2.5	393	3.0
three or more	365	3.3	357	4.3	379	4.7	384	4.4	378	3.3	392	3.4	

Available data also indicates that the possession of a cell phone is linked to student achievement on PISA, with student performance improving with an increase in the number of cell phones at home. This trend is evident across assessment years and domains. Students who performed the lowest were the ones who reported having no cell phone at home or just one, while students who had three or more cell phones at home were the highest performing group. In terms of available computers at home and student performance on PISA assessment, the data reveals that students with the highest performance report having two computers at home. Students who performed the lowest had no computers at home. Students who had two computers at home outperformed students who had no computers at home in the 2018 assessment by 39 points in reading literacy, 47 points in mathematics and 36 points in science. The same trend was also evident in the 2015 PISA assessment, when the difference was 50 points in reading literacy, 47 points in mathematics and 40 points in science (see Table 2). Interestingly, the data shows that students who had three or more computers at home performed worse than students who had two computers at home; this trend was visible across both assessments and all domains.

Conclusion

The reason behind the pressure to achieve a high quality education system generally comes from the understanding that such an education system leads to long-term economic growth (Hanushek and Woessmann, 2008), along with enhanced human capital (Glewwe et al., 2011). Research suggests that a quality education system has not only learning and teaching quality but also equity in educational attainment (OECD, 2013). Generally, an education system is considered to possess quality when it fosters literacy skills in its students (Ho, 2013). On the other hand, equity in education has been receiving more and more attention as a prerequisite for high attainment education systems (OECD 2013). The definition of equity in education refers to a fair education system in which all students, regardless of their gender, ethnicity or family background, acquire at least the minimum skills, and such differences are never an obstacle to achievement and performance (OECD 2013). The Programme for International Student Assessment (PISA) is a triennial international assessment aiming to assess the capacity of students to apply existing knowledge and skills to solve problems and challenges (OECD 2013).

PISA provides information to policy makers on the quality of the education system at a national level, while also providing valuable information on the performance of individual schools. PISA began in 2000 and to date, seven assessments have been done of the attainment of 15-year-old students in mathematics, reading literacy, and science (Thien, 2016).

According to the OECD (2016), socioeconomic status is linked to differences in achievement across countries and economies. Students who have an advantaged socioeconomic standing outperform by a large margin students who are disadvantaged. While this relationship may be stronger for some countries and weaker for others, this positive relationship between the two variables exists in every single country that participates in PISA (OECD, 2016). According to PISA data, in Australia, students who have the highest socioeconomic status are three years ahead of students with low socioeconomic standing (Thomson, 2018). Researchers postulate that students bring to school the inequality that is imposed on them by their family and neighborhood. They carry these inequalities through their education and leave school with them, without much having been done to mitigate the situation (Thomson, 2018).

The gap between students with an advantage and those with a disadvantage persists, mainly because it is still unclear how socioeconomic status predicts student learning and achievement. Many researchers continue to argue that socioeconomic status impacts student learning to a lesser degree compared to the impact that cognitive abilities exert over learning and achievement. Cognitive abilities are generally considered to be based on genetics, and as such, not much can be done to exert influence. However, many large-scale international studies do not support this hypothesis. Researchers maintain that students who come from a low socioeconomic position face an undeniable disadvantage because their home environment does not exactly foster academic learning. These studies maintain that the number of books at home influences achievement and learning; keeping this in mind, parents who have a higher socioeconomic position can provide more resources at home to foster learning. These parents are also more likely to promote cognitive development in their children by offering them a stimulating environment. Furthermore, these parents are also more likely to provide psychological support for their children, while also fostering the development of skills and approaches that are linked to better learning in school (Thomson, 2018).

Considering the available literature, the current analysis focuses on the impact of SES on the achievement of Kosovar students on the 2015 and 2018 PISA assessments, in an attempt to understand whether the trend of impact is the same in Kosovo as in other countries. Data on the performance of Kosovar students on PISA 2015 and 2018 reveal that school type and school location do influence achievement. More specifically, students in private schools outperformed students attending public schools in both years, with the achievement gap rising dramatically from 2015 to 2018, a gap that now exceeds 90 difference points across all domains. Additionally, differences were observed by school location, with students attending village schools performing the worst in both years, followed by those attending schools in small towns and cities. Students who performed the best were those who attended large urban schools.

Experts and policy makers understand how socioeconomic differences impact the quality and equity of education systems and therefore attempt to direct greater support towards students with lower familial socioeconomic standing. To that end, many education systems have decreased the student-teacher ratio for schools in impoverished neighborhoods. According to the OECD (2014), many countries have adopted a similar approach in mitigating the impact of SES on achievement, that is, by employing more teachers in schools that have many students from disadvantaged backgrounds. The Netherlands, Chile and France direct more funding to disadvantaged schools, which also have more teachers compared to other schools (Brandt, 2010; Ladd and Fiske, 2009; Benabou, Kramarz and Prost, 2009). In France, schools with a high intake of low SES students obtain an increase of 16% in funds per student (Moisan, 2011). Other systems have also used the quota approach to make schools admit students from disadvantaged backgrounds. This approach is adopted by countries such as Belgium, the Netherlands and Spain (Calero, 2005; Ladd, Fiske, and Ruijs, 2009).

As with the findings from the literature, the present analysis reveals that household possessions as a measure of socioeconomic status do play an important role in student achievement. Students who had study desk, internet at home, and computers at home performed better than students who lacked such resources in both assessment years.

This trend provides support for the impact of familial settings on student learning and achievement. Mullis, Martin, Ruddock, O’Sullivan, and Preuschoff, (2009) maintain that student achievement on PISA is determined by the availability of a room, a desk, a computer and the internet. In conclusion, PISA data on the performance of Kosovar students reveal that familial socioeconomic factors do influence student achievement; the trend was evident across assessment years, suggesting a stable correlation between the variables. These results thus indicate the need for policy builders to tackle the impact of familial SES on student achievement with the aim of making the Kosovar education system more equitable.

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