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THE IMPACT OF TEACHER QUALITY AND IN-SCHOOL RESOURCES ON KOSOVAR STUDENTS' PERFORMANCE

**Findings from
PISA 2015 results**





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The Impact of Teacher Quality and In-school Resources on Kosovar Students' Performance:
Findings from PISA 2015 Results

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Contents

I. What is this study about?	4
II. Why should we invest in teachers and school resources?	8
III. What should you know about data and methodology?	11
I. Data description	11
II. Methodology	13
IV. What influences Kosovar student performance?	15
I. Empirical Results	15
i. Analysis of Teacher Quality	15
ii. Analysis of In-school Resources	21
V. How to use the results to improve students learning outcomes.....	23
VI. Vërejtje përfundimtare	28
Final remarks	30
Appendix 1 – Description of variables.....	30
Appendix II – Distribution of dependent variable.....	37
Appendix III – Data description.....	38
Appendix IV – Teacher Quality Independent Variables	39
Appendix V – In-school Resources Independent Variables	40
Figure 1: Mean Scores of Science for Kosovo and comparing countries.....	5
Figure 2: Mean Scores of Math for Kosovo and comparing countries.....	6
Figure 3: Mean Scores of Reading for Kosovo and comparing countries.	6
Workshops for specific group of teachers: International OECD Average for PISA reading scale.....	16
Figure 5: Training: International OECD Average for PISA reading scale.....	17
Figure 6: Teacher Absenteeism: International OECD Average for PISA reading scale	18
Figure 7: Inadequate or poorly qualified staff: International OECD Average for PISA reading scale.....	19
Table 1: Correlation between teacher quality and student reading score.....	20
Table 2: Correlation between in-school resources and student reading score.....	22

1. I. What is this study about?

This study analyzes the results of PISA 2015 to investigate the potential impact of teachers and in-school resources on the performance of Kosovar students in reading. In-depth analyses that focus on the factors that influence the quality of education could provide invaluable insights for more effective policy decisions aiming to improve the Kosovo education system through a more efficient allocation of resources within schools. Myriad institutional efforts thus far have demonstrated to be fruitless or produced limited results in improving the Kosovo education system. Therefore, this research is timely and potentially valuable in the incessant attempt to provide a more quality education to Kosovar students.

PISA is an international assessment that takes place every three years with the purpose of measuring the skills of 15-year old students in applying their acquired knowledge of reading, math, and science to solve real life problems.¹ The main goal of PISA is not to ascertain whether students can reproduce knowledge but rather examine how well they can use what they have learned to unfamiliar situations. Such approach mirrors the fact that the economy of the 21st century rewards individuals not merely for what they know but rather for what they can do with the information they have. Therefore, the results produced in PISA test offer significant insights for education policy on how the education system is aiding students' acquisition of knowledge that is deemed imperative for success in their future life. PISA results could be used as a benchmark to enact educational reforms for improving an education system.²

In 2015 Kosovo participated in PISA assessment for the first time. The results of PISA 2015 placed Kosovo pupils in the bottom of the developing countries and in the last place in the region. The 15-year old Kosovar students performed amongst the lowest in all of the testing disciplines. In science, 15-year-olds Kosovars scored 378 points compared to an average of 493 points in OECD countries (see Fig 1); in math students scored on average 362 points compared to an average of 490 points in OECD countries (see Fig 2); and in reading they performed on average 347 points, compared to an average of 493 points in OECD countries (see Fig 3). When compared to the OECD countries, scoring 30 points above the average of OECD countries is roughly similar to completing an extra year of schooling. Considering this, PISA 2015 results for Kosovo show that 15-year-old Kosovar students on average fall behind 4 years of schooling in three subjects compared to their counterparts in OECD countries³. In short, we are failing to prepare our youngsters for the competitive world of the XXI st century.

1 OECD, 2016. "What is PISA?", in PISA 2015 Results (Volume II): Policies and Practices for Successful Schools, OECD Publishing, Paris.

2 See footnote 1.

3 Kelmendi, F. 2017. "Testing, testing: How Kosovo fared in its first international assessment of students." Education for Global Development. World Bank.

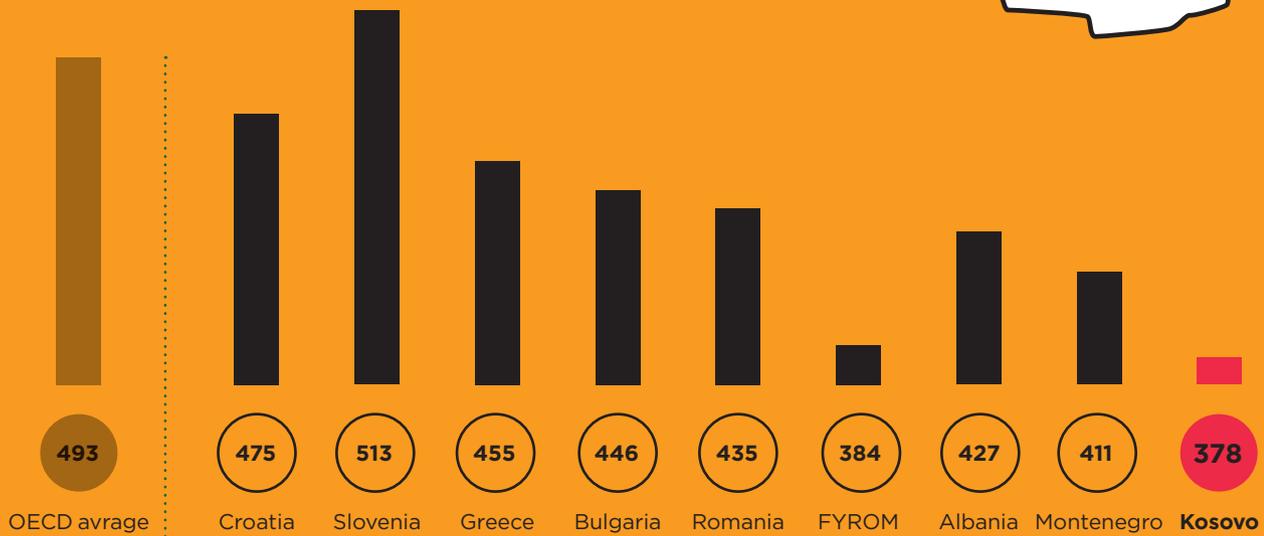
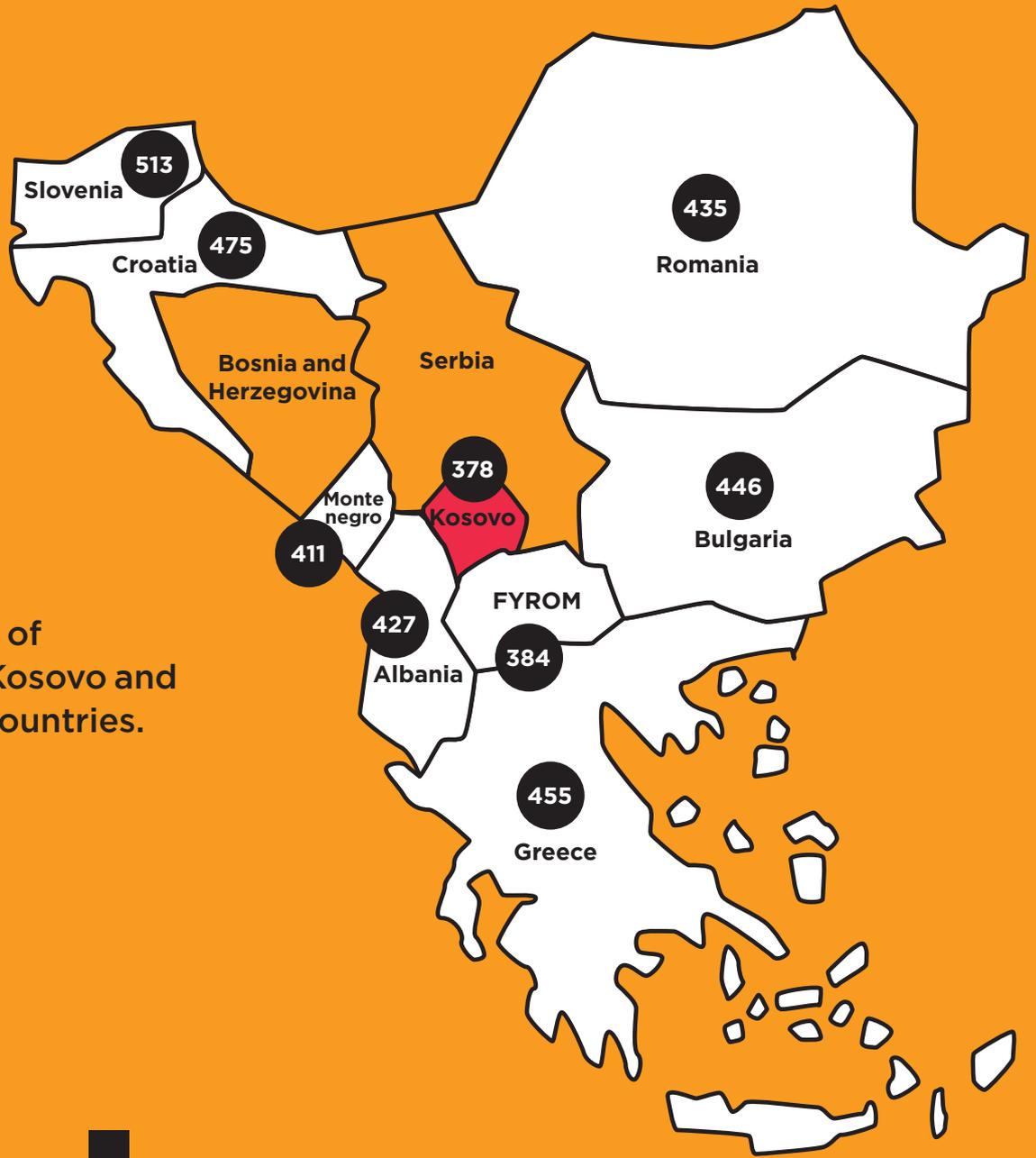
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Figure 1:

SCIENCE

Mean Scores of Science for Kosovo and comparing countries.

Source: OECD 2016



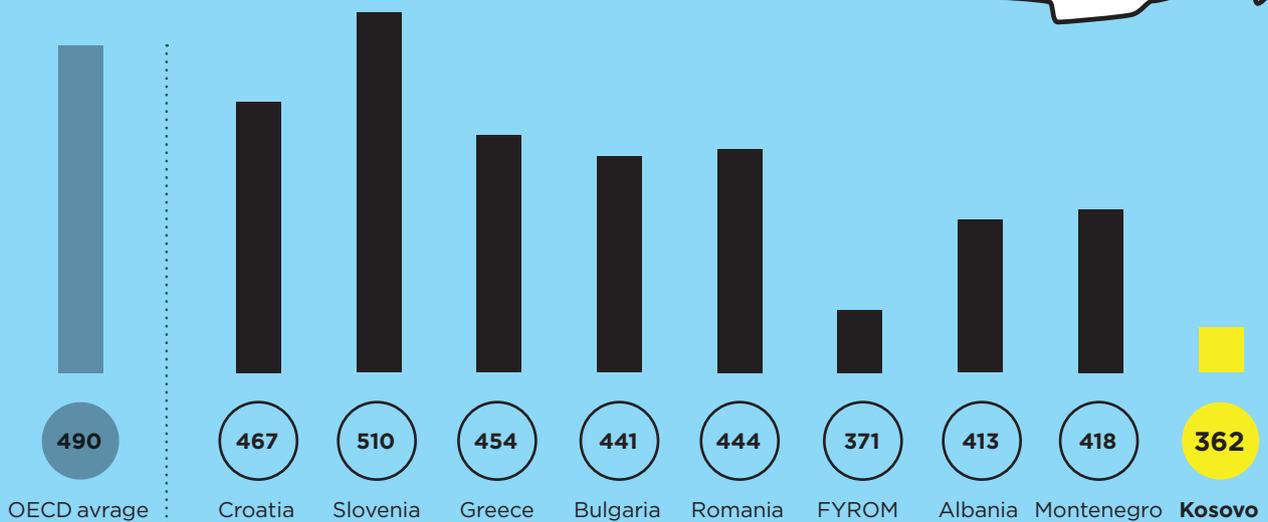
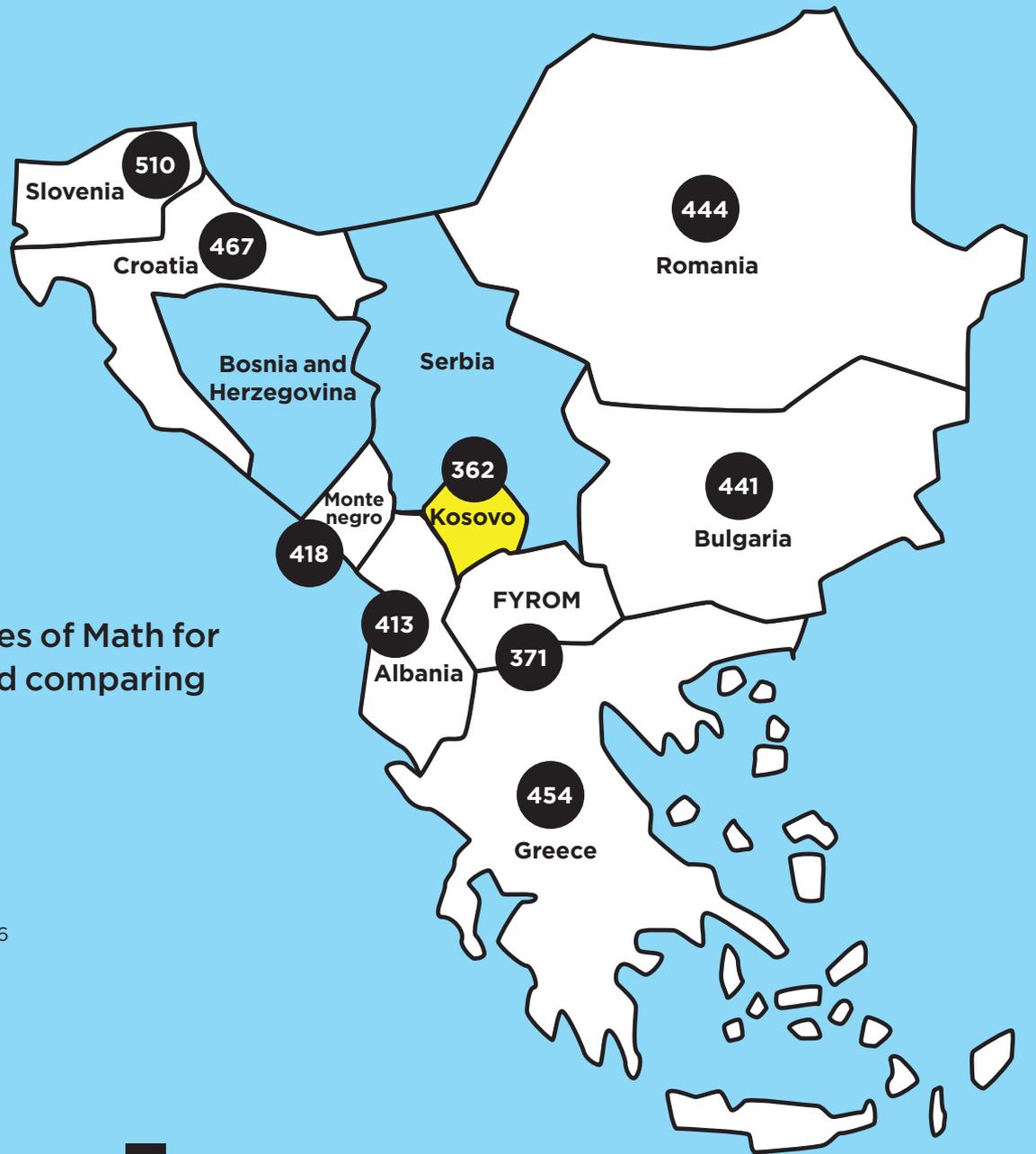
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Figure 2:

MATH

Mean Scores of Math for Kosovo and comparing countries.

Source: OECD 2016



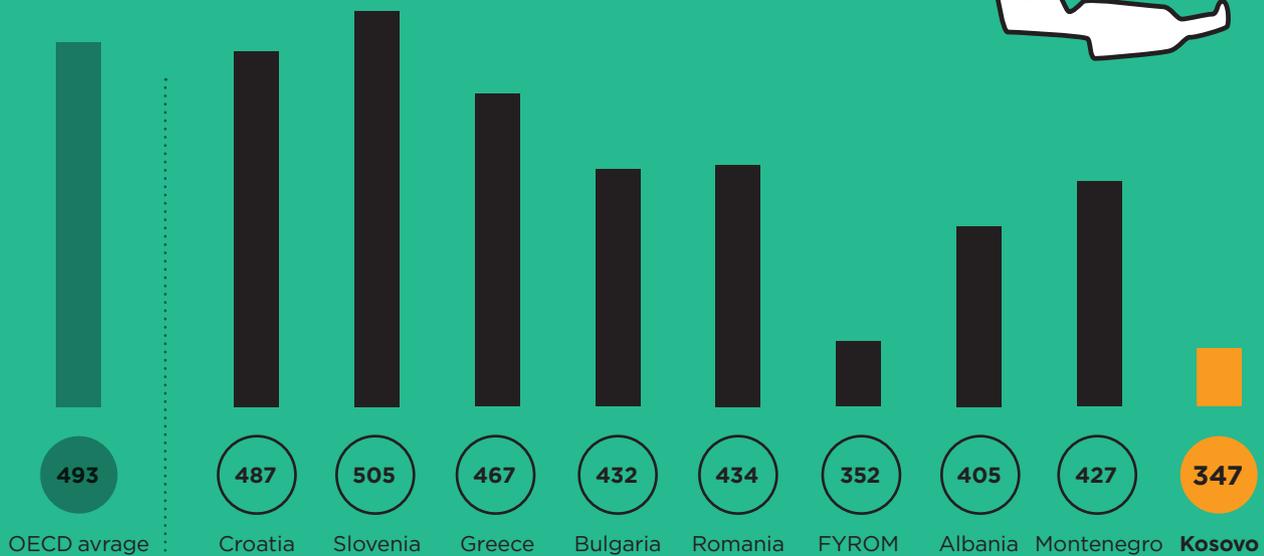
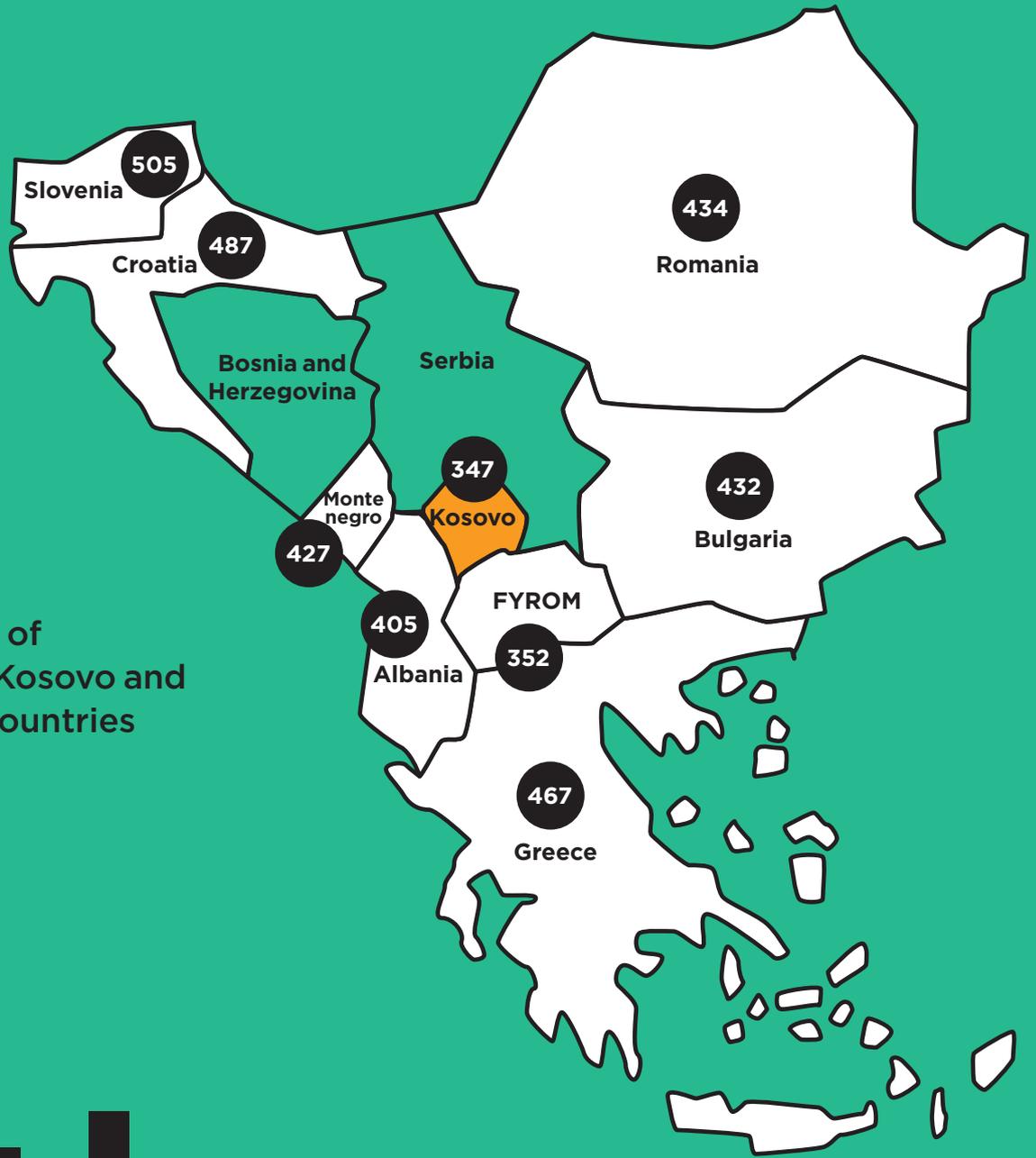
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Figure 3:

READING

Mean Scores of Reading for Kosovo and comparing countries

Source: OECD 2016



The analyses here are based on PISA 2015 published results for Kosovo. This study uses a multilevel regression analysis, accounting for student differences between schools and regions. The regression models built in this study consider the relationship between teacher quality and performance in reading and also the influence of in-school resources on students' achievement in reading scores. Therefore, this study aims to investigate the factors associated with students' performance in order to determine to what extent teacher quality impacts the achievement of Kosovar students in reading scores and what is the role of in-school resources in Kosovar students' performance in reading. The findings of this study suggest that investing in teacher professional development, measuring the performance of teachers in class, and ensuring an interactive communication between teachers and students are all positively and significantly related to students' test scores. Furthermore, improving in-school resources namely investing in books and teaching resources, school infrastructure, and teacher-student ratio are all positively and significantly correlated to students' test scores.

The remaining of the study is organized as following: Section 2 provides the theoretical background and the rationale behind the research questions; Section 3 outlines the study methodology and data description; Section 4 estimates the effect of teachers and in-school resources on the educational achievement of students, in this case students' reading performance; Section 5 provides discussion and policy recommendations; and finally Section 6 concludes the paper and acknowledges the limitations of the study.

2. Why should we invest in teachers and school resources?

Students' achievement is contingent on several factors including individual characteristics, family background, and school resources. The existing literature offers a large number of investigations conducted in an attempt to provide empirical evidence on the theoretical link between school resources and students' achievements. Thus, various researchers have focused their work in examining the role of school on students' academic performance, in addition to the family factor, and the results have demonstrated that class size,⁴ school size,⁵ and teacher quality⁶ perform a significant role in students' learning.⁷ However, while there is literature evidence that teacher quality is directly and positively related to students' learning, for class size and school size the literature points out other factors that need to be addressed in conjunction with those two, for them to have the desired outcome. As such, class and school size are indirectly related to students' learning and depend on investment on other factors as well.⁸ Even though the assertion that background factors, such as socioeconomic status, parents' education, nutrition, parental involvement and so on, significantly impact students' achievement is well documented,⁹ school-level factors are shown to have a considerable impact on students' learning as well. Predominantly, teacher characteristics have strong effects on students' performance.¹⁰ Therefore, considering that background characteristics are factors external to public education policy, special attention should be given to providing access to educational resources e.g. expenditures per students, smaller class size, better infrastructure, and most importantly higher quality teachers. Adequate in-school resources are essential in providing students with a high quality learning environment.

4 Mosteller, Frederick. 1995. "The Tennessee Study of Class Size in the Early School Grades."

5 Haller E.J., & Monk, D.H., (1993). Predictors of High School Academic Course Offerings: The Role of School Size. *American Educational Research Journal* Vol 30, Issue 1, pp. 3 - 21.

6 Ferguson, Ronald F. 1991. "Paying for Public Education: New Evidence on How and Why Money Matters." *Harvard Journal of Legislation* 28:465-498.

7 Darling-Hammond, Linda. 2000. "Teacher Quality and Student Achievement:" *Education Policy Analysis* 8(1).

8 Hanushek, E., "The Evidence on Class Size" (pp.131-168), in Susan E. Mayer and Paul Peterson (Eds.), *Earning and Learning: How Schools Matter* (Washington, DC: Brookings Institutions, 1999).

9 Barton, Paul E. and Richard J. Coley. 2009. "Parsing the Achievement Gap II." *Educational Testing Service. Policy Information Report*.

10 See footnote 6.

Yet, in order for those resources to produce the desired results of better learning outcomes, they ought to be used effectively and distributed efficiently.¹¹ Analyses conducted on the relationship between the quantity of educational resources and student performance demonstrate that such relationship is weak since most of the variation in students' performance is explained by the quality and use of these educational resources¹². Therefore, the focus of the educational policies should not only be in increasing investments in schools but also on how these resources are being utilized. Increasing spending is unlikely to improve student performance if such increase is not complemented with policies that incentivize teachers to perform better or address the challenges that students in a particular school or class are facing.¹³

Student achievement is amongst the strongest predictors of future income and life opportunities¹⁴. Therefore, countries around the world strive to improve their education sector in order to augment the skills of their youngsters and create a competent labor force that will foreseeably contribute towards the social and economic development of the country. Cognitive skills, which are used as a proxy for human capital, have a positive relationship with economic growth. Hanushek and Woessmann (2008) reviewed the role of cognitive skills that draw upon the international testing of PISA on economic well-being and their findings suggest that international achievement measurements reflect an accurate measure of the skills of labor force and these skills are significantly related to economic outcomes.

Economists' conventional view on education espouses the idea that education equips individuals with cognitive skills that increase their productivity and, therefore, their value in the labor market rises.¹⁵ The more education an individual has, the more skillful they are; therefore, they become more productive. This view supports the virtuous cycle of education, human capital, and productivity, which subsequently translates into greater economic growth. The worrisome results of Kosovar students in PISA 2015 assessment, which measured the cognitive skills of 15-year old students, including literacy and numeracy, as well as competencies like critical thinking and problem-solving, require for immediate action in order to improve the education system. PISA 2015 results suggest that Kosovo's future labor force is not equipped with the required skills and knowledge for the modern world economy. With more than half of the population under the age of 24 years old¹⁶ it is important for policy makers to enact policies that would enable investment in economy's biggest asset through education and utilization of Kosovo's human capital. By investing in our youngsters, the benefits of such investment in the long term would translate not only into personal benefits in terms of higher incomes, but also external benefits in terms of overall improvement of social and economic well-being.

11 Hanushek, Eric A. and Lei Zhang (2009), "Quality-Consistent Estimates of International Schooling and Skill Gradients", *Journal of Human Capital*, Vol. 3, No.2, pp.107-143.

12 Rivkin, S. G., Hanushek, E. A. and Kain, J. F. (2005), *Teachers, Schools, and Academic Achievement*. *Econometrica*, 73: 417-458. doi:10.1111/j.1468-0262.2005.00584.x.

13 Jordan, Heather R., Robert L. Mendro, and Dash Weersinghe. 1997. "Teacher Effects on Longitudinal Student Achievement: A Preliminary Report on Research on Teacher Effectiveness."

14 Hanushek, Eric A. and Ludger Woessmann (2008), "The Role of Cognitive Skills in Economic Development", *Journal of Economic Literature*, Vol. 46, No.3, pp. 607-668.

15 Arrow, K. J. (1973). "Higher Education as a filter," *Journal of Public Economics* 2, 193-216. North-Holland Publishing Company aspire in South African Further Education and Training students. International.

16 Kosovo Statistics Agency.

3. What should you know about data and methodology?

1. Data description

This study uses the PISA 2015 dataset published in PISA OECD website. There are three datasets published for Kosovo including cognitive, school background, and student background dataset. Cognitive data represent are students' test scores, assessed through the exams students filled in the three subjects; the school background dataset includes data on school and teacher resources, assessed through the school questionnaire; and student background dataset include information on family background, home resources, and socioeconomic conditions of students, assessed through the student questionnaire¹⁷. For the purpose of conducting analyses of this study, the three datasets have been merged using student ID to produce one dataset. For 2015 PISA assessment, 4,826 Kosovar students aged 15 who were selected randomly were tested. Of students tested 47 percent were females and 53 percent were males and they came from all seven major regions of Kosovo, including both urban and rural settlements.

Students were assessed in three main areas: reading, mathematics, and science. This study includes regression estimates for reading results¹⁸ to show the relationship between students' performance and teacher and school resources. Considering that extensive research suggests that there is a correlation between reading and mathematics and science performance, this study uses the scores of only one subject to represent students' achievement. Based on the assertion that higher reading comprehension draws higher math and science performance¹⁹, reading scores are used as the as dependent variable in this analysis.²⁰ The dataset contained missing data which belonged to any of the three categories: no response missing values which represent questions that students did not answer; not reached missing values which refer to answers that students were not able to complete due to lack of time; and system missing data which come as a result of technical problems. No response missing and not reached missing values have been replaced with zero because students were not able to score these questions right. System missing data represent computer technical errors, and as such they are not included in the calculation of students' test scores.

17 School questionnaire was filled by school management, while student questionnaire was filled from students and their parents. These questionnaires are available in PISA 2015 website.

18 Explained in detail at the methodology section.

19 Cromley, J. G. (2009). Reading achievement and science proficiency: International comparisons from the Programme on International Student Assessment. *Reading Psychology*, 30(89), 89-118.

20 Martin, M. O., & Mullis, I. V. S. (Eds.). (2013). *TIMSS and PIRLS 2011: Relationships among reading, mathematics, and science achievement at the fourth grade—implications for early learning*. Chestnut Hill, MA: Boston College.



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47%

Due to the missing data, PISA uses plausible values (PVs) to estimate students' test results and perform cross-countries comparison. Plausible values are imputed values that try to predict students' responses when there is missing data. As such, PVs are not individual test scores; they are imputed values used to measure the average population performance in education.²¹ This study does not use plausible values but instead uses only the actual responses of students in the exam. As part of the process of data cleaning, three new variables have been generated using reading cognitive data. The first one is Reading Questions, which calculates the number of questions asked in exams for the Reading subject, ignoring system-missing values. The second is Reading Count Variable that counts the number of questions students answered correctly in each of the subjects tested in PISA exam. The third variable is the Reading Percentage Variable which represents the percentage of questions that were answered correctly by students in each subject and also represent the dependent variable for this study.

21 Scaling PISA Cognitive Data (2012). PISA 2012 Technical Report OECD 2014, p. 143-163.

2. Methodology

This study uses multilevel linear regression model, which uses one dependent variable, known as outcome of interest, regressed in chosen independent variables. Regression analysis is used to explain the relationship between the dependent and independent variables. In this study, the dependent variable is students' test scores in reading, and the regression model is used to estimate whether there is a correlation between the students' test scores in reading with school and teacher resources. As such, the regression model does not infer causality or magnitude of the relationship between the dependent and independent variables; it only establishes a relationship, which strength is assessed through p-value and not through the coefficient, per se. As such, a p-value of less than 0.01 infers a strong relationship between the dependent and independent variables; while, compared to 0.01, a p-value less than 0.1, indicates a weaker relationship between the dependent and independent variables. Multilevel linear regression model in this case accounts for differences in students' test scores in different levels, namely school (one level) and region (another level). The equation below presents the reduced regression equation:

$$R_{isj} = \beta_0 + \beta_1 T_{isj} + \beta_2 S_{ij} + \varepsilon_{isj}$$

where R is the dependent variable that represents students' reading score for student i in school s in region j; T represents teacher quality, including the methodology teacher use in class to explain and enhance students' understanding of school subjects, investment in teachers' professional development, and teacher performance measurement; and S represents the school resources, both quantity and quality of school assets. The regression estimation allows to detect and determine a correlation between the students' reading test scores and teacher and school resources; however, it should be noted that the results produced through this regression model do not represent causation between dependent and independent variables.

Students differ from each other based on the school they attend as well as the region where their school is located. Therefore to account for these differences, this study uses multilevel linear regression. Furthermore, the regression controls for other variables that are related to students' performance, specifically school autonomy, family socio economic status, educational resources at home, student's gender, as well as type of school student attend (private or public), and as such the results presented in the following section depend on these factors that the model is controlling for. The unobservable variables that can impact students test scores, such as culture-related variables, perceived importance of the education, job-related variables, and age-related variables (adolescence) are accounted in the error term ε_{isj} .

4. What influences Kosovar student performance?

4.1 Empirical Results

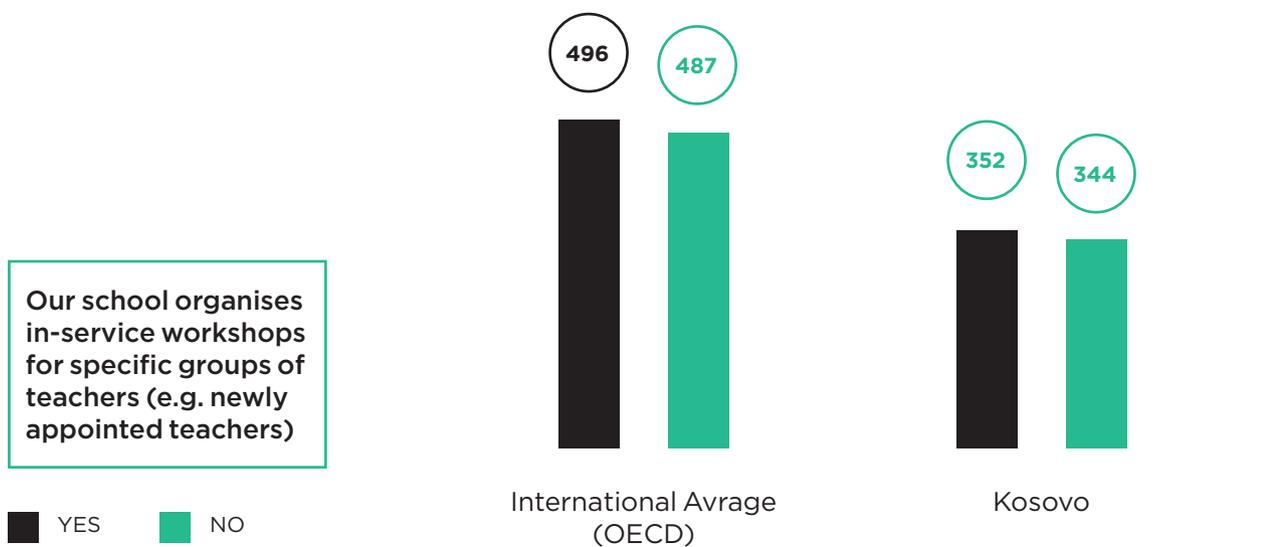
4.1.1 Analysis of Teacher Quality

There are three main aspects assessed through teacher quality variables, namely measurement of teacher performance, indirect investment in teachers through professional development programmes, and teacher's performance and activities in class.

As it can be seen in Table 1, holding other variables constant, using test or assessment of students' achievement to monitor the teaching practices of teachers is positively correlated with students' test score. In other words, student's test score in reading is bettered for 4 points, if schools use such tools to monitor teacher performance. Similar results are achieved if the school monitors the teaching practices through observation of classes by inspect. If the school uses such tools to measure teacher performance in class, then students' test scores in reading will be 3 points higher compared to the score of students in a school that does not measure teacher practice through observation or inspect. Furthermore, measuring school progress from one year to another is positively correlated to students' test scores. If the school uses the performance of students in the teacher-developed tests to monitor the school's progress from year to year, students' reading scores in that school are higher by 3 points as compared to a student who attends a school that does not perform such activity.

Investing indirectly in teachers through workshops that aim to enhance their teaching skills and ensure that they understand the latest reforms applied in education to adopt them in their everyday teaching is important for students' performance. As seen in Table 1, if the school organizes in-service workshops for specific groups of teachers, namely newly appointed teachers, students' test scores in that school are higher for 7.9 points compared to the school that does not organize such workshops. These workshops refer to the seminars that are organized within schools for specific group of teacher e.g. newly appointed staff. The same relationship has been estimated in the OECD countries as well. As seen in Fig. 4 below the OECD average in reading score is higher for students in schools that organize in-service workshops for specific group of teachers.

Figure 4: Workshops for specific group of teachers: International OECD Average for PISA reading scale

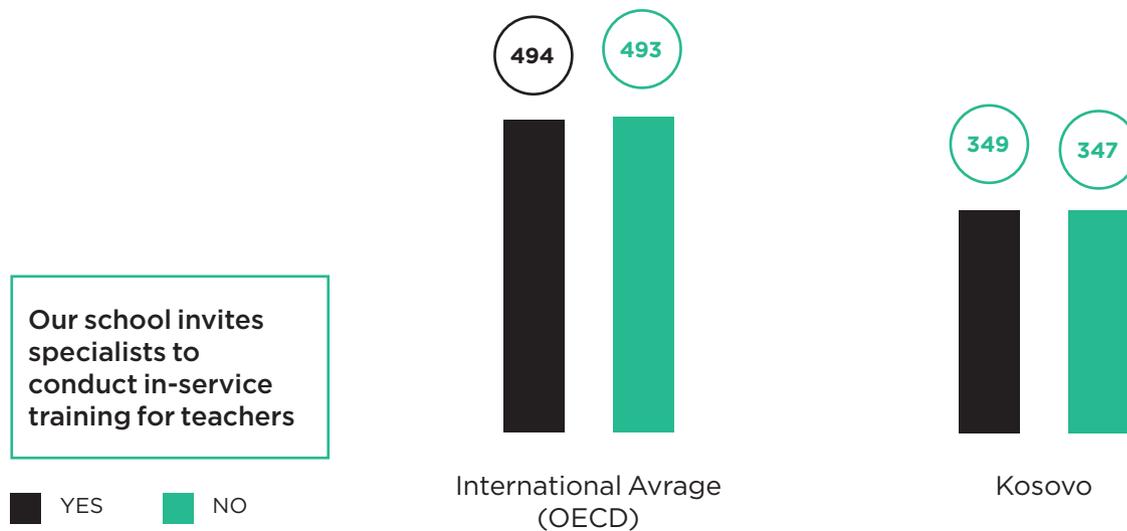


Source: OECD

Moreover, inviting specialists to conduct in-service training for teachers is positively correlated with students' test scores. These types of training are held by external training specialists that school invites to train school teachers in different subjects. Test scores of students who are in schools that conduct training for teachers perform better by 3 points compared to the students in schools that do not offer such services to the teachers. The International OECD average for reading is also higher for students who attend schools where teacher benefit from in-service trainings with specialists (see Fig. 5)

Students also benefit from teachers attending professional development programmes. The Professional Development Program is a program designed to enhance teaching skills or pedagogical practices. The program should last at least one day in total and it should be focused on education and teaching. Students' test scores, whose teachers have attended any professional development program, are higher for 0.07 points compared to students whose teachers have not completed trainings of professional development. However, this difference in scores is not very high; therefore, should be used heedfully.

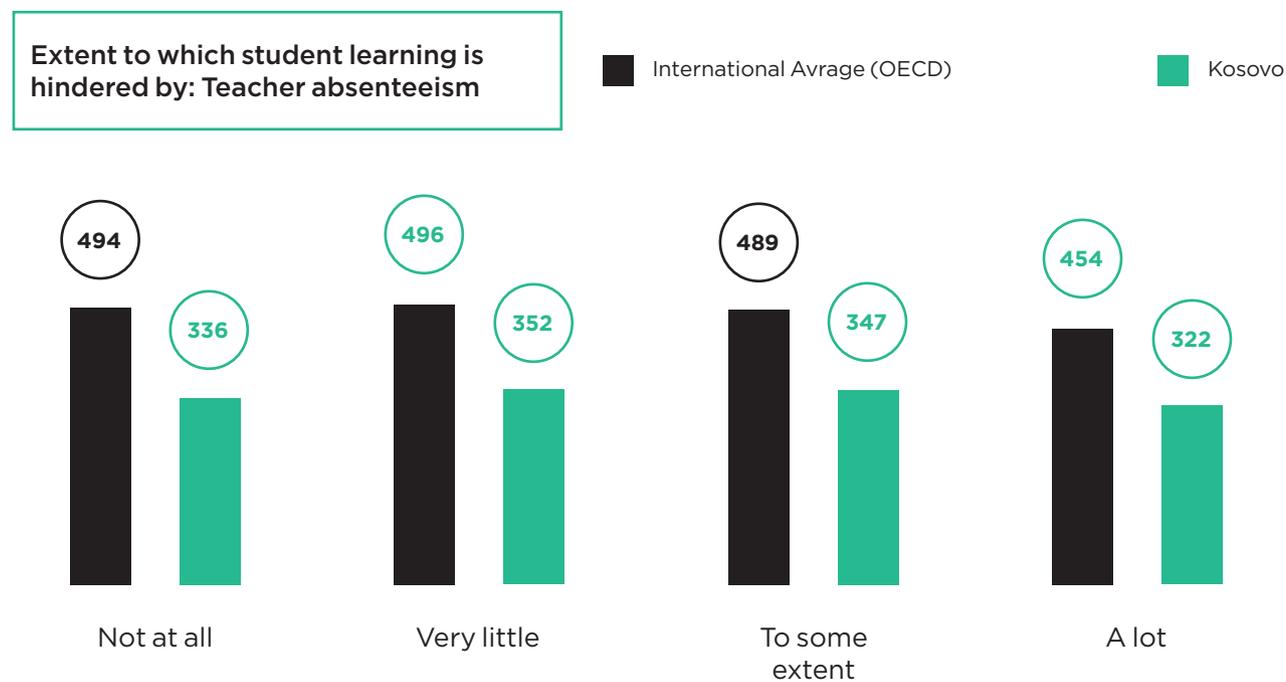
Figure 5: Training: International OECD Average for PISA reading scale



Source: OECD

In addition, teaching methods that teachers use in class to engage students in learning activities matter to students' comprehensive abilities which subsequently affect students' test scores. This assertion is supported by the results of this analysis as well. As seen in Table 1 teacher absenteeism is negatively correlated with students' test scores. If the teacher does not show up in class, students' test scores are worse by 4 points compared to students whose teacher shows up in class. As seen in Fig.6 the same results hold for the OECD countries as well. Student in schools where principles declared that student learning is hindered by teacher absenteeism perform worse.

Figure 6: Teacher Absenteeism: International OECD Average for PISA reading scale

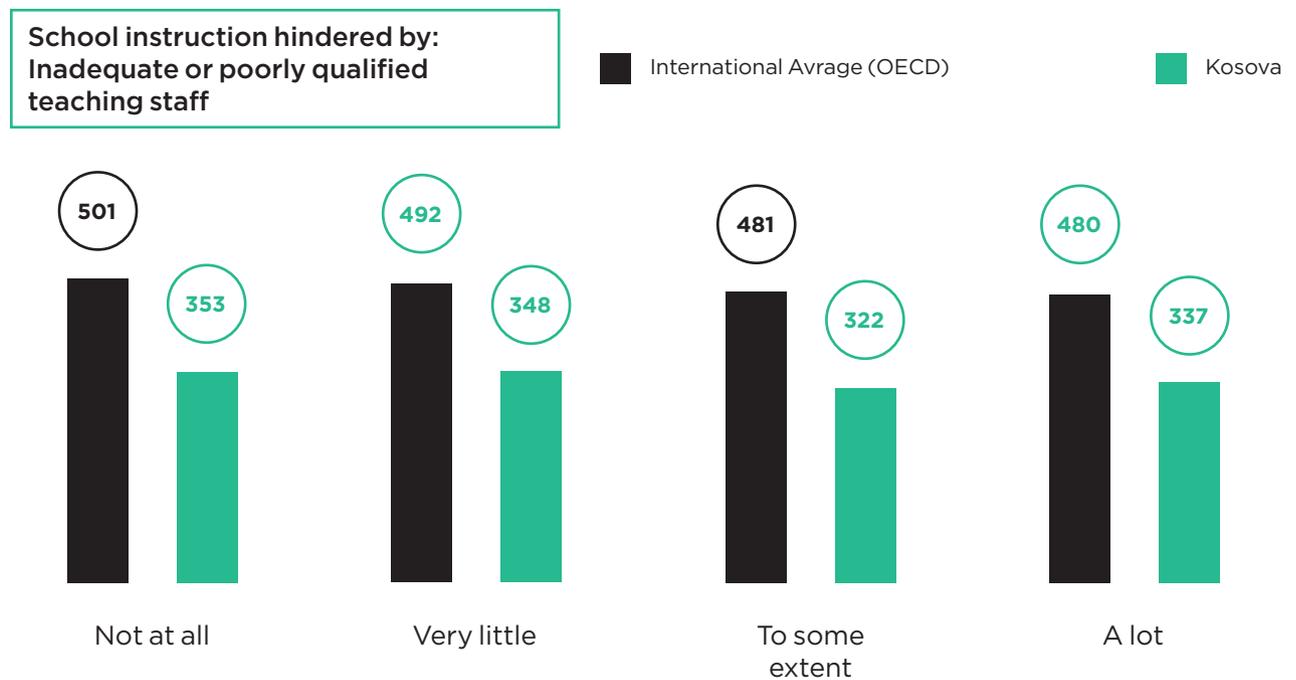


Source: OECD

However, for students to perform better it is important that teachers not only show up in class but are also well prepared for teaching lessons. In cases where principles claimed that school instruction is hindered by inadequate or poorly qualified and not prepared teaching staff, students' reading scores are worse by 2.4 points compared to the students that attend schools in which principles reported to have qualified teacher's cadre. The same trend has been detected in the OECD countries as well. As seen in Fig 7 the average reading scores tend to drop when principles claim that school instruction is hindered by inadequate or poorly qualified teaching staff.

Teacher's well preparedness is related to the activities organized in class, as well as to the methods used in explaining the school-related topics. If the teacher provides feedback to students on their strengths, then students' test scores are bettered for 3 points, compared to students who do not receive comments and feedbacks from teachers that guide students how to improve.

Figure 7: Inadequate or poorly qualified staff: International OECD Average for PISA reading scale



Source: OECD

While teaching science-related topics, if students are required to argue about science questions they perform better in the test. As results indicate students that are required to argue about questions during their class lectures, perform better by 4.5 points compared to students who do not argue with one another in class. Furthermore, if teachers initiate class discussion with the students, then this helps students perform better in reading since their test scores are better for 2.9 points compared to the scores of students who are not exposed to class discussion during their learning process in class. Teachers showing interest in every students learning process matters for students' academic performance as well. The results suggest that if teacher shows interest and attention to each students learning, then students test scores are higher for 4.9 points compared to the test scores of students who do not get the same interest from their teachers. Lastly, teacher clearly explaining the relevance of concepts explained in school to everyday life, is positively correlated with students test scores. If teachers use this teaching method when giving lectures, then students' test scores are better by 4 points compared to the scores of students whose teachers do not connect school lessons with everyday life situations.

Table 1: Correlation between teacher quality and student reading score

Teacher Quality	Reading Score	
	Coefficient	Standard Error
Monitor Teachers	4.335***	1.610
Observation	3.045*	1.655
Monitor School Progress	3.371**	1.635
Workshops for New Staff	7.973***	1.557
Training	3.180**	1.555
Programme for Professional Development	0.074***	0.022
Teacher Absenteeism	-4.128*	2.158
Low Teacher Quality	-2.460*	1.482
Teacher Comment	3.191*	1.86
Arguing for Science	4.567**	2.373
Discussion	2.933**	1.387
Interest for Students	4.994***	1.492
Relevance	4.037**	1.711
Constant	27.902	33.17
Observations	747	
R-squared	0.307	

* p<0.1, ** p<0.05, *** p<0.01

4.1.2 Analysis of In-school Resources

The second analysis conducted estimates the impact of in-school resources, namely physical infrastructure, availability of teaching staff and learning resources, as well as classroom environment, on students achievement. Such analysis helps in identifying the in-school factors that influence students' performance and offer information to extrapolate how a more efficient allocation of resources could occur to get better learning outcomes.

The results seen in Table 2 show that building quality, lack of books, availability of funds to teachers, and class size, are factors that influence the performance of Kosovar students in reading scores. Students who attend schools where principals answered that inadequacy or poor quality of physical infrastructure hinders school instruction perform worse by 7.111 points, after controlling for students background, individual characteristics, and school characteristics, compared to students who attend schools where principle reported that instruction is not hindered by inadequate or poor physical infrastructure.

Educational materials are also found to be significant in students' achievement. The results indicate that a lack of educational materials e.g. textbooks, IT equipment, library or laboratory material, negatively influences students' performance and this relationship is highly significant. Students who attend schools that lack educational materials perform poorer in reading by 8.431 points, even after accounting for socio-economic status, individual background, and teacher characteristics. Another variable that is correlated with students' performance is the availability of extra funds to teachers. If schools allocate a big share of their extra funding into improvement of teachers, then students perform better in reading by 3.897 points, keeping everything else constant. Finally, the results above support the assertion that class size influences the students' academic performance since the relationship between class-size and reading score is positive. As results in Table 2 denote, students who attend classes that are bigger in size score 0.625 points lower that students in smaller classes, keeping everything else constant. The coefficient in this case is less than a point, and that is because this correlation depends on other factors, such as teachers' quality, school autonomy, family socio economic status, educational resources at home, and the type of school (private or public).

Table 2: Correlation between in-school resources and student reading score

In-school Resources	Reading Score	
	Coefficient	Standard Error
Building quality	-7.111**	3.201
Lack of Educational Materials	-8.431***	2.396
Extra Fund to Teachers	3.897**	1.653
Class Size	-0.625**	0.256
Constant	77.653	37.707
Observations	701	
R-squared	0.22	

* p<0.1, ** p<0.05, *** p<0.01

5. How to use the results to improve students learning outcomes?

Extensive existing literature suggests that in-school resources e.g. school infrastructure, class size, textbooks, laboratory equipment and alike, play an immense role in providing students with high-quality opportunities to learn. All these resources are expected to be offered by schools who operate based on public funds. The education sector, just like other public sectors, requires financial resources in order to provide high quality services to its students. Considering this the initial perception is usually that students of high-income countries and economies perform better because their countries have more resources available to spend on education.²² Nevertheless, analyses conducted on the relationship between expenditure per student and performance demonstrate that changes in spending do not necessarily relate to students' performance.²³ Hence, it can happen that students from countries of different economies perform similar despite the substantial different level of spending per student. For instance, students from the United States and the Slovak Republic score at 481 points in mathematics, yet, United States spends roughly double the amount of Slovak Republic per students. Similarly, countries with the same level of expenditure per student can perform differently. For example, even though Italy and Singapore both spend around USD 85,000 per student, in PISA 2012 Italy scored 485 points in mathematics, while Singapore scored 573 points.²⁴ These finding suggest that excellence in education needs more than just money. Allocation of resources is just as essential as the amount of resources available for spending. Considering this Kosovo's policy makers should focus not necessarily in increasing spending on education but rather utilizing the available funds to improve factors that impede students learning.

22 In PISA High-income countries and economies are defined those with a per capita GDP above USD 20 000.

23 OECD, 2016. "What is PISA?", in PISA 2015 Results (Volume II): Policies and Practices for Successful Schools, OECD Publishing, Paris.

24 See footnote 20.

Below are presented the recommendations that were drawn based on the results of analyses conducted above which demonstrate where should the focus of policy makers be:

5.1 There must be a shift in the paradigm of the traditional professional development programmes.

Teachers, as the most crucial resource that influence students' achievement, require continuous investments. Based on the findings of this study, allocating resources towards enhancement of teachers teaching skills and pedagogical practices, in the form of workshop, in-school trainings, and professional development programmes, is efficient because such investment is shown to be beneficial to students' test scores. Specifically, in-service training for teachers that equip them with new skills and qualifications and professional development programmes that aim to meet specific teaching priorities, are direct investment recommendations towards teacher professional development. These training can be focused on the integration of technology in everyday teaching, upgrades in the method of teaching that refer mostly to the student-centered teaching methodology in order to provide students more opportunities for in-class participation, and research on the best teaching practices that have demonstrated to be successful in similar countries as Kosovo.

However, for the trainings to produce the intended results, there must be a shift in the paradigm of the traditional professional development programmes. Professional development programmes and in-service trainings should be decentralized in order to meet the authentic demands and expectations of individual teachers. As the findings of this study suggests, students' performance increases if school organizes in-service workshops for specific groups of teachers, for instance newly hired staff. Considering that the composition of schools and classrooms is affected by various out of school factors, teachers in different schools and classrooms face different challenges that are related to the composition of students they serve. Therefore, autonomy should be given to teachers and schools to identify their own problems in their classrooms and solve most of their problems through in-service trainings that train teachers to address their challenges relevant to the context in which teachers operate. Nonetheless, professional development programmes and in-school trainings must be supplemented with other reforms within schools, subjected to student academic development, in order to make it easier for teachers to spread their knowledge and enable student to better understand the course materials.

5.2 Teachers should be given continues support in the classroom

Teachers should be given support in ensuring that the curriculum is implemented, class discussion and arguments are initiated, students are engaged in class discussion and activities, and tailored help is provided to students who lack behind in the learning process. Teachers often time face challenges inside the classroom that prevent them from focusing on student-led activities. For instance, when class size is big, teachers are obliged to spend most of their time in managing classroom environment. Considering that class size reduction does not seem to provide large improvements in students' performance, teachers should be given support in other ways to manage their classrooms. For example, as part of teachers trainings and workshop lessons in classroom management could be included where teachers would be given the opportunity to discuss the challenges they face inside their classrooms. The aim of these discussions would be to identify problems in schools and offer specific solutions that would aid the learning process for a better student performance. Moreover, classroom management could be an activity for assisting staff who would support teachers in curriculum implementation, engagement of students in class, assist each student based on their specific needs, facilitate in-class discussion, and initiate arguments for different school subjects.

5.3 Teachers performance should be measured through monitoring mechanisms.

As supported by the results of this study, monitoring teachers' performance through external observation is positively related to students' test scores. In order to ensure that the education system is built to produce results, creating a monitoring mechanism for the performance of teachers and schools is crucial. Teacher performance is directly, positively, and significantly related to students' performance. Investing in teachers through training and professional development is a step forward, but it is not enough. For the training and workshops to have the intended effect, a monitoring system should be put in place to evaluate whether the lessons learned in these programmes are actually being implemented in classroom. To achieve this, special focus must be given to the teacher performance evaluation and teacher licensing system in Kosovo. Such external evaluations could also diagnose the challenges teachers are facing to implement what they learn in professional development programmes and in-service trainings and use such information to improve professional development programmes offered in the future which would help in designing trainings that are tailored toward teachers' needs.

These monitoring and evaluation tools should also be used to provide descriptive feedback for improvement of teachers and schools overall, which will be directly translated into the improvement of students learning outcomes. Through the process of monitoring the best performing teachers could be identified and rewarded in the forms of bonuses. Such a policy designed under a framework of a meritocratic system to reward the best performing teachers should be implemented carefully until it reaches a certain threshold after which financial compensation no longer serves as an incentive for teachers to perform better.

5.4 Investment should be focused in providing educational materials and improving classroom learning environment

The educational resources available in a school tend to be correlated with the overall performance of the system. Analyses show that the performance of students in test among OECD countries can be explained by differences in the responses of principals to questions on the adequacy of in-school resources like instructional materials (textbooks), and library materials. The same relationship has been identified in the performance of Kosovar students as well. Considering the current state of education in Kosovo, it is suggested an immediate and urgent investment in the availability of books. There is lack of literature for Kosovar students in the Albanian language that would offer students access to information outside of the textbooks that are used by teachers to deliver teaching lessons. Living in a time when information is power, it is imperative to provide students access to literature that serves comprehensive information on various topics.

The results of these analyses demonstrate that physical infrastructure is also very important for students learning. Having a high quality physical infrastructure that satisfies the basic needs is a prerequisite for students learning and if this essential condition is not satisfied than any other investment is futile. However, the improvements in infrastructure should occur until they reach a certain threshold after which the investment in physical infrastructure no longer benefits students learning. Well-equipped schools with various educational materials e.g. IT equipment, Internet connectivity, or laboratory materials, as well as additional funds that enable teachers to improve teaching methodologies help schools in creating a learning classroom environment rather than making schools merely instructional institutions that prepare students for the next level of schooling.

6. Final remarks

Even though the study is conducted with considerable diligence as to ensure accuracy of the results presented, the limitations within this study should be acknowledged. The data collected from PISA is based on survey responses hence the possibility of bias in the dataset due to self-reports exists. Collecting accurate information from principles regarding their schools can be particularly difficult due to their inclination to represent their school in better position in the eyes of a third party. Also, the collected data on the economic and social status of students might not be precise due to the tendency to overstate the level of education, earnings, and other information related to individuals' status in society. Moreover, this study used only the data that had information on all the questions asked in questionnaire. Not all students answer all the questions, and as such the sample size decreased from the original sample size of students who took the PISA 2015 exam. However, the raw data responses, which represent a more accurate snapshot of the education outcomes of students in Kosovo, have been used and therefore this allows for more precise and straightforward policy recommendations.

The conclusions to be drawn from both the theory behind investing in education and the results of this study, is that investing in teacher professional development and in-school resources, and measuring and evaluating teacher performance will positively affect students' test scores. Specifically, students' test scores are positively and significantly related to the participation and learning of teachers in professional development programmes, training from external experts, and workshops. Even though there are training sessions organized for teachers in Kosovo for curriculum application and inclusion of the best teaching practices, focus should be provided to the actual implementation of the learning outcomes in the training programmes. Furthermore for these programmes to produce the intentional results, a system of monitoring and evaluation of teachers effectiveness and programme impact in practice should be established. That is because monitoring would ensure implementation of the best teaching methodologies in classroom, inclusion of technology in the process of learning, inclusion of students in discussion and argument, provision of feedback to students, and relationship between school subjects and their application to real life, which have been identified to positively impact Kosovar students' achievement. For teachers to have the possibility to focus on student-led and student-engagement methods of teaching, greater support should be given to teachers in classroom. In order to better manage classroom activities and ensure more student engagement in learning activities, teachers could benefit from classroom management discussions tailored specifically to their needs and from assisting staff who would support teachers in curriculum implementation, engagement of students in class, assist each student based on their specific needs, facilitate in-class discussion, and initiate arguments for different school subjects. To achieve these reforms, investment in teacher quality in conjunction with high quality physical infrastructure is a prerequisite. However, investments in physical infrastructure should be done with diligence until it reaches a certain threshold, where it actually has an effect and produces the desired learning outcomes. Yet, in order to relish the benefits of this investment, it is important to simultaneously improve other in-school resources, particularly education resources available to students. As the analysis of this study suggest, lack of educational materials inhibits the possibility of students to receive a comprehensive understanding of lessons taught in

school as well as to go beyond the discussion that takes place in the classroom. Availability of educational resources, as well as additional funds that enable teachers to improve teaching methodologies help schools to become better learning environment rather than just instructional institutions that prepare students for the next level of schooling.

Appendices

Appendix 1 – Description of variables

Variable Name	Question	Original Code	Transformed Code
Programme of Professional Development	Teaching staff in your school has attended a programme of professional development? All teaching staff		
Extra Fund to Teachers	If we ever have some extra funding, a big share goes into improvement of our <school science> teaching.	1-Yes 2-No	0-No 1-Yes
Update Teaching Practices	Frequency of <the last academic year>. I promote teaching practices based on recent educational research.	1:Did not occur 2:1-2 times during the year 3:3-4 times during the year 4:Once a month 5:Once a week 6:More than once a week	1=Yes (if it occurred at all) 2=No (if it did not occur at all)
Workshops	Our school organizes in-service workshops which deal with specific issues that our school faces.	1-Yes 2-No	0-No 1-Yes
Monitor Teachers	During <the last academic year>, used to monitor the practice of teachers? Tests or assessments of student achieve.	1-Yes 2-No	0-No 1-Yes
Test Effectiveness1	Are teacher-developed tests used in school? To make judgments about teachers' effectiveness	1-Yes 2-No	0-No 1-Yes
Monitor School Progress	Are teacher-developed tests used in school? To monitor the school's progress from year to year	1-Yes 2-No	0-No 1-Yes
Teacher Mentoring	Does improvement exist at school? Teacher mentoring	1-Yes, this is mandatory, e.g. based on district or ministry policies 2-Yes, based on school initiative 3-No	0-No (if never done) 1 - Yes (if done))

Variable Name	Question	Original Code	Transformed Code
Measures in Educational Staff	Did your school implement any measures in: Educational staff (e.g. workload, personal requirements?)	1-Yes 2-No, because results were satisfactory 3-No for other reasons	0 - No (is not done for any reason) 1 - Yes (if done)
Lack of Teacher Preparedness	Extent to which student learning is hindered by: Teachers not being well prepared for classes	1-Not at all 2-Very little 3-To some extent 4-A lot	0 - No 1 - Yes
Explain Ideas	When learning <school science>? Students are given opportunities to explain their ideas.	1-In all lessons 2-In most lessons 3-In some lessons 4-Never or hardly ever	0 - No (if it does not happen) 1 - Yes (if it happens)
Practical Experiments	When learning <school science>? Students spend time in the laboratory doing practical experiments.	1-In all lessons 2-In most lessons 3-In some lessons 4-Never or hardly ever	0 - No (if it does not happen) 1 - Yes (if it happens)
Arguing for Science	When learning <school science>? Students are required to argue about science questions.	1-In all lessons 2-In most lessons 3-In some lessons 4-Never or hardly ever	0 - No (if not done) 1 -Yes (if done)
Application of Science Idea	When learning <school science>? The teacher explains <school science> idea can be applied	1-In all lessons 2-In most lessons 3-In some lessons 4-Never or hardly ever	0 - No (if not done) 1 -Yes (if done)
Teacher Comment	How often does this happen in <school science>? The teacher gives me feedback on my strengths <school science> subject	1-Never or almost never 2-Some lessons 3-Many lessons 4-Every lesson or almost every lesson	0 - No (if not done) 1 -Yes (if done)
Observation	During <the last academic year>, used to monitor the practice of teachers? Observation of classes by inspects.	1-Yes 2-No	0-No 1-Yes
Test Effectiveness	Are <standardized tests> used in school? To make judgments about teachers' effectiveness	1-Yes 2-No	0-No 1-Yes
Resisting Change	Extent to which student learning is hindered by: Staff resisting change	1-Not at all 2-Very little 3-To some extent 4-A lot	0 - No (if not at all) 1 - Yes (if it happened)
Teacher Absenteeism	Extent to which student learning is hindered by: Teacher absenteeism	1-Not at all 2-Very little 3-To some extent 4-A lot	0 - No (if not at all) 1 - Yes (if it happened)

THE IMPACT OF TEACHER QUALITY AND IN-SCHOOL RESOURCES ON KOSOVAR STUDENTS' PERFORMANCE:

Variable Name	Question	Original Code	Transformed Code
Workshops for New Staff	Our school organizes in-service workshops for specific groups of teachers (e.g. newly appointed teachers).	1-Yes 2-No	0-No 1-Yes
Training	Our school invites specialists to conduct in-service training for teachers.	1-Yes 2-No	0-No 1-Yes
Teacher Quality	School instruction hindered by: Inadequate or poorly qualified teaching staff.	1-Not at all 2-Very little 3-To some extent 4-A lot	0-No (if not at all) 1-Yes (if yes at any extent)
Teachers: Full time	Teachers in TOTAL: Full-time		
Master Teacher	Teachers with an <ISCED Level 5A Master's degree> qualification: Full-time		
Test to Students Needs	Are teacher-developed tests used in school? To adapt teaching to the students' needs	1-Yes 2-No	0-No 1-Yes
Test to Compare Schools	Are teacher-developed tests used in school? To compare the school with other schools	1-Yes 2-No	0-No 1-Yes
School Internal Evaluation	Internal evaluation \ Self-evaluation	1-Yes, this is mandatory, e.g. based on district or ministry policies 2-Yes, based on school initiative 3-No	0-No 1-Yes
Measure Quality of Teaching	Did your school implement any measures in: Quality of teaching and learning	1-Yes 2-No, because results were satisfactory 3-No for other reasons	0-No 1-Yes
Measure Teacher Development	Did your school implement any measures in: Teacher professional development	1-Yes 2-No, because results were satisfactory 3-No for other reasons	0-No 1-Yes
Express Opinion	How often does this happen in your <school science>? Teacher gives an opportunity to express opinions.	1-Every lesson 2-Most lessons 3-Some lessons 4-Never or hardly ever	0-No (if never) 1-Yes (if happened)
Relevance	When learning <school science>? The teacher clearly explains relevance <broad science> concepts to our lives.	1-Every lesson 2-Most lessons 3-Some lessons 4-Never or hardly ever	0-No (if never) 1-Yes (if happened)

Variable Name	Question	Original Code	Transformed Code
Perform Investigation	When learning <school science>? Students are asked to do an investigation to test ideas.	1-Every lesson 2-Most lessons 3-Some lessons 4-Never or hardly ever	0-No (if never) 1-Yes (if happened)
Interest for Students	How often does this happen in your <school science> lessons? The teacher shows interest every students learning.	1-Every lesson 2-Most lessons 3-Some lessons 4-Never or hardly ever	0-No (if never) 1-Yes (if happened)
Extra Help	How often does this happen in your <school science> lessons? The teacher helps students with their learning.	1-Every lesson 2-Most lessons 3-Some lessons 4-Never or hardly ever	0-No (if never) 1-Yes (if happened)
Discussion	How often does this happen in your <school science> lessons? A whole class discussion takes place	1-Never or almost never 2-Some lessons 3-Many lessons 4-Every lesson or almost every lesson	0-No (if never) 1-Yes (if happened)
Improvement	How often does this happen in <school science>? The teacher tells me in which areas I can still improve.	1-Never or almost never 2-Some lessons 3-Many lessons 4-Every lesson or almost every lesson	0-No (if never) 1-Yes (if happened)
Performance Improvement	How often does this happen in <school science>? The teacher tells me how I am performing in this course.	1-Never or almost never 2-Some lessons 3-Many lessons 4-Every lesson or almost every lesson	0-No (if never) 1-Yes (if happened)
Computers for Students	Student-comp ratio in <national modal grade for 15-year-olds>. Total num.\stud. <national modal grade for 15-year-old		
Building Quality	School instruction hindered by: Inadequate\poor quality physical infrastructure (building, grounds, heating\cooling).	1-Not at all 2-Very little 3-To some extent 4-A lot	0 - No (not at all) 1 - Yes (if it happens)
Lack of Infrastructure	School instruction hindered by: Lack of physical infrastructure (building, grounds, heating\cooling, lighting).	1-Not at all 2-Very little 3-To some extent 4-A lot	0 - No (not at all) 1 - Yes (if it happens)
Lab Equipment	We have enough laboratory material that all courses can regularly use it.	1 - Yes 2 - No	0 - No 1 - Yes

THE IMPACT OF TEACHER QUALITY AND IN-SCHOOL RESOURCES ON KOSOVAR STUDENTS' PERFORMANCE:

Variable Name	Question	Original Code	Transformed Code
Help Room	Does your school provide study help? Room(s) where the students can do their homework	1 - Yes 2 - No	0 - No 1 - Yes
Class Noise	How often does this happen in your <school science> lessons? There is noise and disorder.	1-Every lesson 2-Most lessons 3-Some lessons 4-Never or hardly ever	0 - No (if it does not happen) 1 - Yes (if it happens)
Study Help	Does your school provide the following study help? Staff help with homework	1 - Yes 2 - No	0 - No 1 - Yes
Extra Fund to Teachers	If we ever have some extra funding, a big share goes into improvement of our <school science> teaching.	1 - Yes 2 - No	0 - No 1 - Yes
Book Quality	Inadequate or poor quality educational material (e.g. textbooks, IT equipment, library or laboratory material).	1-Not at all 2-Very little 3-To some extent 4-A lot	0 - No (not at all) 1 - Yes (if it happens)
Lack of Educational Materials	A lack of educational material (e.g. textbooks, IT equipment, library or laboratory material).	1-Not at all 2-Very little 3-To some extent 4-A lot	0 - No (not at all) 1 - Yes (if it happens)
Lack of Teaching Staff	School instruction hindered by: A lack of teaching staff.	1-Not at all 2-Very little 3-To some extent 4-A lot	0 - No (not at all) 1 - Yes (if it happens)
Class Size	Class size (13-53)		
Student Teacher Ratio	Student teacher ratio (1-100)		
Assisting Staff	School instruction hindered by: A lack of assisting staff.	1-Not at all 2-Very little 3-To some extent 4-A lot	0 - No (not at all) 1 - Yes (if it happens)
Certified Teacher	Teachers <fully certified> by <the appropriate authority>: Full-time		
Teacher Peer Review	During <the last academic year>, used to monitor the practice of teachers? Teacher peer review	1 - Yes 2 - No	0 - No 1 - Yes
External Evaluation	Does improvement exist at school? External evaluation	1-Yes, this is mandatory, e.g. based on district or ministry policies 2-Yes, based on school initiative 3-No	0 - No 1 - Yes

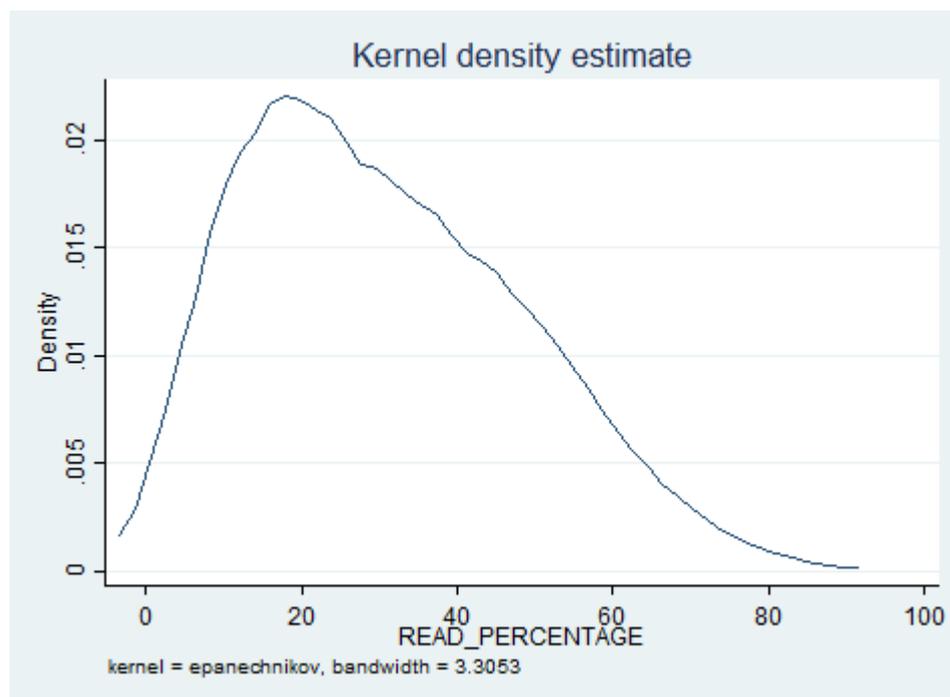
Variable Name	Question	Original Code	Transformed Code
Teacher Professional Development	Did your school implement any measures in: Teacher professional development	1-Yes 2-No, because results were satisfactory 3-No for other reasons	0 - No 1 - Yes
Community School Location	Which of the following definitions best describes the community in which your school is located?	1-A village, hamlet or rural area (fewer than 3 000 people) 2-A small town (3 000 to about 15 000 people) 3-A town (15 000 to about 100 000 people) 4-A city (100 000 to about 1 000 000 people) 5-A large city (with over 1 000 000 people)	
Age	Student's age		
Grade Repetition	Grade Repetition	0-Did not repeat a <grade> 1-Repeated a <grade>	
Parents Education	Highest education of parents	0-None 1-ISCED 1 2-ISCED 2 3-ISCED 3B, C 4-ISCED 3A, ISCED 4 5-ISCED 5B 6-ISCED 5A, 6	
Hiring Teachers NEA	Selecting teachers for hire: National education authority	0-Not checked 1-Checked	
Firing teachers NEA	Firing teachers: National education authority	0-Not checked 1-Checked	
Teacher Salary NEA	Establishing teachers' starting salaries: National education authority	0-Not checked 1-Checked	
Salary Increase NEA	Determining teachers' salary increases: National education authority	0-Not checked 1-Checked	
School Budget NEA	Formulating the school budget: National education authority	0-Not checked 1-Checked	
Budget Allocation SGB	Deciding on budget allocations within the school: <School governing board>	0-Not checked 1-Checked	
Student Disciplinary Policies NEA	Establishing student disciplinary policies: National education authority	0-Not checked 1-Checked	
SAP Teachers	Establishing student assessment policies: Teachers	0-Not checked 1-Checked	

THE IMPACT OF TEACHER QUALITY AND IN-SCHOOL RESOURCES ON KOSOVAR STUDENTS' PERFORMANCE:

Variable Name	Question	Original Code	Transformed Code
Student Admission Teachers	Approving students for admission to the school: Teachers	0-Not checked 1-Checked	
Student Admission SGB	Approving students for admission to the school: <School governing board>	0-Not checked 1-Checked	
Textbooks LEA	Choosing which textbooks are used: <Regional or local education authority>	0-Not checked 1-Checked	
Course Content NEA	Determining course content: National education authority	0-Not checked 1-Checked	
Courses Offered SGB	Deciding which courses are offered: <School governing board>	0-Not checked 1-Checked	
Home Possessions	Home possessions (WLE)		
Home Educational Resources	Home educational resources (WLE)		
Home Cultural Possessions	Cultural possessions at home (WLE)		
ESCS	Index of economic, social and cultural status (WLE)		
Private Public	Is your school a public or a private school?	1-A public school 2-A private school	
Gender	Student (Standardized) Gender	1-Female and 2-Male	

Appendix 2 – Distribution of dependent variable

In order to ensure that the scores used in this study as dependent variable represent students' test scores, two main methods have been used: data distribution of Reading percentage and the variation in Reading Percentage explained by plausible values in reading. As seen in the graph below, Reading Percentage variable follows a normal distribution, skewed to the right, which comes as a result of substantial missing data. If the scores follow a normal distribution, it is a sufficient reason to believe that these scores are actual students' test scores in reading. R-squared between the Reading Percentage and plausible values for reading is 74.5 percent. An R-square between these two variables higher than 50 percent, is the other reason to believe that these scores are actual students' test scores in reading.



Appendix 3 – Data description

Variable	Observations	Mean	Std. Dev.	Min	Max
READ_PERCENTAGE	2,710	30.66234	17.84672	0	88.23529

Variable	Observations	Mean	Std. Dev.	Min	Max
Gender	4,826	1.527973	.4992686	1	2
Age	4,826	15.7357	.279094	15.33	16.25
Private/Public	4,824	1.041874	.2003219	1	2
Boys Enrolled	4,826	474.8305	267.4439	13	1322
Girls Enrolled	4,826	444.0392	296.1212	11	1660

Appendix 5 – In-school Resources Independent Variables

Linear regression

Number of obs = 701
 F(54, 64) = 109.66
 Prob > F = 0.0000
 R-squared = 0.2272
 Root MSE = 15.963

(Std. Err. adjusted for 65 clusters in c)

READ_PERCENTAGE	Robust					[95% Conf. Interval]	
	Coef.	Std. Err.	t	P> t			
ComputersforStudents	-.2072055	.0421344	-4.92	0.000	-.2913786	-.1230323	
BuildingQuality	-7.110941	3.201401	-2.22	0.030	-13.50648	-.7154072	
LackofInfrastructure	-2.309032	2.648154	-0.87	0.387	-7.599328	2.981263	
LabEquipment	-.4514425	2.899242	-0.16	0.877	-6.243345	5.34046	
HelpRoom	1.842446	4.099516	0.45	0.655	-6.347279	10.03217	
ClassNoise	-.0598262	1.415699	-0.04	0.966	-2.88801	2.768358	
StudyHelp	-7.848821	2.524206	-3.11	0.003	-12.8915	-2.80614	
ExtraFundtoTeachers	3.897869	1.653776	2.36	0.021	.5940716	7.201666	
BookQuality	5.307654	3.782908	1.40	0.165	-2.249573	12.86488	
LackofBooks	-8.431621	2.396439	-3.52	0.001	-13.21906	-3.644184	
LaackofTeachingStaff	4.240675	2.077262	2.04	0.045	.0908662	8.390483	
ClassSize	-.6257192	.256992	-2.43	0.018	-1.13912	-.1123186	
CommunitySchoolLocation	6.442843	1.217157	5.29	0.000	4.011293	8.874394	
StudentTeacherRatio	.408243	.1264282	3.23	0.002	.1556737	.6608123	
ParentsEducation	-1.820393	.9025731	-2.02	0.048	-3.62349	-.0172957	
age	-1.529164	2.096227	-0.73	0.468	-5.716859	2.658532	
GradeRepetition	-9.655853	3.567219	-2.71	0.009	-16.78219	-2.529515	
escs	4.160088	1.865709	2.23	0.029	.4329058	7.887269	
HiringTeachersNEA	-14.72007	8.048336	-1.83	0.072	-30.79847	1.358326	
FiringteachersNEA	-2.422044	2.954998	-0.82	0.415	-8.32533	3.481243	
TeacherSalaryNEA	-2.044576	2.691038	-0.76	0.450	-7.420543	3.33139	
SalaryIncreaseNEA	-3.272013	4.286366	-0.76	0.448	-11.83501	5.290986	
SchoolBudgetNEA	-7.067784	2.13295	-3.31	0.002	-11.32884	-2.806726	
BudgetAllocationSGB	-.0190919	1.677121	-0.01	0.991	-3.369527	3.331343	
StudentDisciplinaryPoliciesNEA	-2.884002	2.300118	-1.25	0.214	-7.479015	1.711011	
SAPTeachers	-1.048049	2.255212	-0.46	0.644	-5.553353	3.457255	
StudentAdmissionTeachers	1.605885	2.850429	0.56	0.575	-4.088501	7.300272	
StudentAdmissionSGB	3.253768	1.64619	1.98	0.052	-.0348747	6.54241	
TextbooksLEA	-8.425424	2.965609	-2.84	0.006	-14.34991	-2.500938	
CourseContentNEA	8.988334	1.965293	4.57	0.000	5.06221	12.91446	
CoursesOfferedSGB	-.5308219	1.739212	-0.31	0.761	-4.005297	2.943653	
HomePossessions	-2.497719	1.286466	-1.94	0.057	-5.067729	.0722919	
HomeEducationalResources	2.328409	.8938076	2.61	0.011	.5428232	4.113995	
HomeCulturalPossessions	-.3923929	1.113345	-0.35	0.726	-2.616556	1.83177	
PrivatePublic	-2.165815	7.119994	-0.30	0.762	-16.38964	12.05801	
Gender	-6.040596	1.755055	-3.44	0.001	-9.546722	-2.534471	
Training	4.089678	2.201328	1.86	0.068	-.3079792	8.487335	
WorkshopsforNewStaff	-3.493972	3.237896	-1.08	0.285	-9.962413	2.974469	
AssStaff	-1.302505	1.347674	-0.97	0.337	-3.994794	1.389783	
TestEffectiveness	-4.056226	1.413278	-2.87	0.006	-6.879572	-1.232879	
Observation	3.231474	1.401846	2.31	0.024	.4309642	6.031983	
MasterTeacher	-3.998572	2.948013	-1.36	0.180	-9.887905	1.890762	
MonitorTeachers	-2.404736	1.370378	-1.75	0.084	-5.142381	.3329097	
TestEffectiveness1	4.595753	2.253982	2.04	0.046	.0929056	9.098601	
MonitorSchoolProgress	-2.923471	2.432999	-1.20	0.234	-7.783945	1.937004	
TeacherMentoring	11.91152	3.133585	3.80	0.000	5.651461	18.17157	
CertifiedTeacher	-.1408604	.0390856	-3.60	0.001	-.2189429	-.0627779	
TeacherProfessionalDevelopment	.1202784	.0325443	3.70	0.000	.0552636	.1852932	
TeacherPeerReview	-6.84881	2.172217	-3.15	0.002	-11.18831	-2.509307	
ExternalEvaluation	4.247365	2.096845	2.03	0.047	.0584362	8.436294	
TeacherProfessionalDev	5.086844	3.808142	1.34	0.186	-2.520793	12.69448	
MeasureStAchievement	-2.103347	2.442107	-0.86	0.392	-6.982016	2.775322	
MeasuresinEducationalStaff	1.628929	2.261081	0.72	0.474	-2.8881	6.145958	
MeasureQualityofTeaching	-1.024292	2.150558	-0.48	0.635	-5.320524	3.271941	
_cons	77.65341	37.7007	2.06	0.043	2.337607	152.9692	

