

# Do Education Budget, Classroom Quality, and Class Ratio Matter To Students' Academic Performance? An Empirical Study In Indonesia

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**Abstract.** The objective of this study was to analyze the direct and indirect effects of education budget, classroom quality, and student class ratio on students' academic performance through teacher qualification. The population of this study was all regencies and cities in Java and Madura Islands, there were 112 regencies or cities. The variables of the research were education budget, classroom quality, student class ratio, teacher qualification, and students' academic performance. It used the secondary data from the ministry of Education and Culture of the Republic of Indonesia. Then, they were analyzed with descriptive and path analysis. The results of descriptive analysis showed that 93.88% of teachers were qualified since they got the bachelor degree, 279 classrooms were excellent, education budget was IDR 1,891,047 per student, and students' academic performance was only 59.20. Then, the research found that education budget gave a positive effect on students' academic performance through improving teacher qualification. Education budget also influenced students' academic performance through improving the classrooms quality.

**Keywords:** Education Budget, Classroom Quality, Student Class Ratio, Teacher Qualification, Students' Academic Performance

## 1 Introduction

Academic performance refers to the knowledge obtained and marked by the score given by the teacher. In the context of education, academic achievement is an educational goal achieved by students, teachers or institutions for a certain period and measured either by continuous examination or assessment. Moreover; the goals or the academic achievement can be various and different depend on the individual or the institution itself. The score or score of learning outcomes in Indonesia is usually expressed in numbers. The score of learning outcomes is excellent if students get 100. Meanwhile; the score is very good if they acquire 80 or 90. Then, 70 and 60 are better and good enough scores. If students can acquire excellent or very good learning outcomes, they can develop broader potential in their future.

There were many researches on the relationship between teachers and quality of education. Firstly, Abe (2014) [1] stated that education quality in a country was determined by teacher quality. He found that there was an important factor in improving students' abilities in

mathematics; it was teacher qualifications. Qualified teachers were teachers who had certificates or licenses to become professional teachers issued by authorized institutions (Musau and Aberu, 2015)[2]. Based on Law No. 20 in 2004 concerning on National Education System article 42 paragraph (1), it stated that Educators should have minimum qualifications and certification related to the level of teaching authority, good and healthy physic and mental, and the ability to realize the national education goals [3]. The article clearly explained that teachers in Indonesia should have minimum qualifications and take certification to improve their academic qualifications and competency. Bamidele and Adekola (2017) [4] also stated that well-qualified teachers were teachers who had certificates and mastered their areas of expertise.

Kosgei, Mise, and Ayugi (2013) [5] also examined the influence of teacher characteristics on students' academic achievement in the secondary schools. They found that there was not any significant relationship between teacher qualification and students' academic achievement. Igwe (1990) [6] also examined the influence of teacher qualification on students' academic performance on science subjects. The results showed that there was not any significant relationship between teacher qualification and students' academic performance. Meanwhile; the studies done by Adeniji (1999)[7], Osokoya (1999) [8] and Oladele (1999)[9]found that teacher qualification gave little contributions on students' academic performance.

Education quality was also influenced by basic facilities at schools (Maphoso and Mahlo, 2014)[10]. Basic facilities are all facilities facilitating the on-going education process at schools, such as infrastructure, buildings, water, electricity, sanitation and classrooms. A good classroom is a classroom which fulfills several characteristics of the classroom, such as adequate size, good lighting, good room temperature, clean floor conditions, good wall conditions, proportional doors and windows, and equipped with class equipment; good chairs, table, blackboard, etc. The better class facilities will improve classroom quality in studying. According to Hallack (1990) [11], physical facilities were the strategic factors in operating and implementing the functions of the organization which determined the best performance of social organizations, including education institutions.

Nkong, George, and Mohamadou (2016)[12] also found that water availability, laboratory completeness, classroom conditions, electricity, sports facilities, and learning materials significantly influenced students' academic performance. Then, Akomolave and Adesua (2016) [13] also found that physical facilities were significantly related to students' academic performance. And, Afework (2014)[14] found the availability of school facilities and learning materials, both in quality and quantity, gave a positive effect to improve education quality.

Some studies also examined the relationship between class size and students' academic performance. Ammermuller, Heijke, and Wobmann (2005) [15]found that class size gave a positive effect on the test scores, only if it was not controlled by a variable. When it was controlled, the coefficient became insignificant. Bandur (2011) [16] found that school budgets could improve the teaching and learning process and students' academic performance. Meanwhile, Oyegoke (2012)[17] found that there was not any relationship between the unit cost per student at secondary schools and students' academic performance.

Based on the explanation, the research hypotheses can be seen below:

Hypothesis 1= Education budget has a positive effect on classroom quality

Hypothesis 2= Education budget has a positive effect on class size

Hypothesis 3= Class quality has a positive effect on class size

Hypothesis 4= Education budget has a positive effect on teacher qualifications.

Hypothesis 5= Class size has a positive effect on teacher qualifications.  
 Hypothesis 6= Classroom quality has a positive effect on teacher qualifications.  
 Hypothesis 7= Teacher qualification has a positive effect on students' academic performance.  
 Hypothesis 7=: Classroom quality has a positive effect on students' academic performance  
 Hypothesis 8= Classroom quality has a positive effect on students' academic performance.  
 Hypothesis 9= Class size has a positive effect on students' academic performance.

## 2 Methods

The population of this study was all districts and cities in Java and Madura, excluded DKI Jakarta. DKI Jakarta was excluded of this study because there were extreme differences related to the research data, especially on the budget per student. The total population were 112 regencies and cities. It was a census research which included all population for collecting the data. The data were collected by documentation. The research data was obtained from the Ministry of Regional Education and Culture's Balance Sheet in 2016. Data were processed using the path analysis method with the AMOS program.

The variables of the study were first, students' Academic Performance; it was based on the results of the national exam (National Standardized Test / NSTand measured based on the average national examination scores of each district or city. Second, teacher qualification (TeachQual); it was the level of formal education achieved by teachers, such as undergraduate, postgraduate, and non-degree and measured by comparing the teachers with minimum qualifications divided by total teachers. Third, classroom quality (RoomQuality); it was the condition of the classrooms physically including furniture and class equipment and measured by comparing the good qualified classrooms divided by the total classrooms available. Fourth, class size (Student Class Ratio) was the number of students in a class and calculated based on the ratio of the number of students per class. Fifth, budget per Student is education budget allocation provided by the local government for each student in the area concerned.

## 3 Results and Discussion

The results of the descriptive analysis of 112 districts and cities in Java and Madura are shown in Table 1.

Table 1. Results of Descriptive Analysis of Research Variables

	N	Descriptive Statistics			Std. Deviation
		Minimum	Maximum	Mean	
TeacherQual	112	87.20	97.60	93.8830	2.41780
RoomQuality	112	35	1,173	278.94	184.161
StudentClassRatio	112	23.00	37.00	29.6161	2.81004
BudgetperStudent	112	51,000	6,307,700	1,891,047,	792,855.942
NST	112	49.60	68.50	59.2027	3.91871
Valid N (listwise)	112				

Based on Table 1, it can be seen that the mean of teacher qualification (teacherqual) was 93.88%, it means that most teachers were qualified to have the bachelor/ undergraduate degree. It was only 6.12% of unqualified teachers. This condition is different to the condition of good classroom quality. There were only 279 good qualified classrooms from 1,173 classrooms per district/ city. It indicated that on average, the number of good qualified classes was relatively low. The student class ratio was 29.6 or rounded up to 30 students. It means that in a class, there were about 30 students. It was relatively ideal; it can be seen that the minimum numbers in a class were 23 students and the maximum numbers were 37 students. Then, budget per student was at IDR 1,891,000. Budget per student on average was based on the Standard Educational Costs in Vocational High Schools for some expertise programs. Furthermore, the average of national exam score was 59.20. It was not optimal and it closed to the good enough criteria and still far from very good or excellent. If it was associated with the allocated budget, then students' academic performance should be better. However, this condition can be understood because the standard educational costs in Indonesia was relatively low comparing to other countries, such as Malaysia or Singapore.

Based on path analysis the relationship among variables based on the results of data analysis is presented in Table 2.

Table 2. Result of Data Analysis

Regression Weights: (Group number 1 - Default model)						
			Estimate	S.E.	C.R.	P
RoomQuality	<---	BudgetperStudent	.000	.000	-	***
					4.109	
StudentClassRatio	<---	BudgetperStudent	.000	.000	-	.076
					1.774	
StudentClassRatio	<---	RoomQuality	.004	.001	3.055	.002
TeacherQual	<---	StudentClassRatio	.203	.070	2.899	.004
TeacherQual	<---	RoomQuality	-.005	.001	-	***
					4.701	
TeacherQual	<---	BudgetperStudent	.000	.000	4.966	***
NST	<---	TeacherQual	.854	.155	5.492	***
NST	<---	StudentClassRatio	-.243	.127	-	.055
					1.920	
NST	<---	RoomQuality	.007	.002	3.378	***

Source: Processed Data in 2018

The results showed that education budget gave a negative and significant influence on classroom quality. It means that the higher education budget decreased classroom quality. Vice versa, when the level of education budget is low, it gave better classroom quality. It contradicts the theory which stated that the more budget, the better classroom quality would be. It was understood because when we wanted to create a good classroom quality, it needed money or budget. However; this empirical fact was an anomaly. This anomalous condition was likely due to the use of budget focuses on educational operational activities and on improving teacher competency. It made classroom quality was ignored or neglected; it should also get attention, indeed. As already explained that the budget was a limited resource, so education providers should make priorities on using the budget.

Second, the education budget gave a negative and significant influence on class size. It means that the more education budget, the more likely the school would limit the number of students in one class to create the ideal condition. In other words, the school would decrease

the number of students per class although education budget went up. Hallack (1990) stated that the education cost was used to finance three types of expenses; they were routine expenditure, other recurring expenditures, and capital expenditures. Routine expenditure was used for educational operations and offices. Other recurring expenses were used for scholarships, assistance, and maintenance of facilities and infrastructure. Meanwhile, capital expenditure was used for the purchase of assets such as buildings, laboratory equipment, and office equipment. The education cost was issued every period although the number of students in one class went down.

Schools needed supports in developing and implementing financial models which might be useful for attracting and retaining more students at schools (Lima, 2011)[18]. The big class showed that the school was not good in managing students because the burden of education would be heavier. The empirical facts in Indonesia showed that the number of students per class from time to time was relatively same although education budget has increased. It means that the amount of education budget did not influence the number of students in a class. Third, classroom quality gave a negative influence on class size. In other words, the better classroom quality, the number of students in each class also changed. These changes could be positive (increased) or negative (reduced). Classroom as one of the school's physical facilities was a fundamental factor in improving academic performance. The physical facilities were office buildings, classrooms, libraries, furniture, laboratories, sports facilities, learning materials and laboratory materials. Classroom quality significantly influenced class size.

Fourth, class size had a positive effect on teacher qualification. It means that the more students in the class, the more teachers were encouraged to improve their educational qualifications. Vice versa, the fewer students in the class, it made the teachers reluctant to improve their educational qualifications. According to Ehrenberg and Brewer (1994) the number of students in the class influenced them to understand the subject matter. Big classes had more complex characteristics than small classes. Big classes were more noisy and created various interactions among class members. It made the teachers more difficult to control the class comparing to the small classes.

Fifth, classroom quality negatively influenced teacher qualification. It means that the optimal classroom quality was not fully followed by good teacher qualification. The relationship direction of these two variables was anomalous. Classroom quality was supposed to positively encourage teachers improve their qualifications, but it gave a negative influence. This study contradicted the research results which stated that availability, relevance and adequacy had a positive effect on students' academic achievement (Suleman and Hussain, 2014). This anomalous condition of classroom quality with teacher qualification was relevant to the previous findings that the budget was more focused on the operational priorities of education (e.g. improving teacher competency).

Sixth, education budget significantly had a positive effect on teacher qualification. The greater education budget, the more teachers encouraged to have undergraduate education qualifications. The dependent variable of this hypothesis was teacher qualification, it was measured by the percentage of teachers with at least undergraduate education, while the independent variable was education budget, it was measured by the budget per student. The finding of this study was in related to Hallack's (1990) opinion, one of the education expenses was for scholarships and assistance. The use of a directed education budget for scholarships and assistance could motivate teachers to improve their educational qualifications. If the teacher was given a stimulus for scholarships and various assistance programs to improve competence, then the teacher were eager to improve his/ her capabilities. The more education

budget was directed to improve the teachers' capacity, the more teachers would get the minimum degree of qualification.

Seventh, was in line with Bandur's study (2011). He found that school budget could improve the teaching and learning processes and students' academic performance. Case and Deaton's research (1999)[19] also found a strong relationship between school resources and education quality and test scores. Munda and Odebero (2014) also found a significant positive influence of unit costs on students' academic performance. The higher the cost per unit, the more it would improve academic performance. Schools with high income have better academic performance comparing to schools with lower income.

Eighth, there was a positive and significant influence of teacher qualification on students' academic performance. It means that teachers with higher qualifications had a positive effect for students to achieve higher students' academic performance. Vice versa, teachers with lower qualifications would make students' academic performance less optimal. Teacher qualification could positively improve students' academic performance. The result of this study was same with the research of Aliyu et al. (2013); (Olowookere, et.al., 2016)[20] that there was an influence of student learning outcomes based on teacher qualification. Teachers with higher qualifications had a positive effect for students to achieve higher academic performance. Then, teachers should get professional training related to teaching skills. Experienced teachers also played an important role in the learning process (Bamidele and Adekola, 2017). Teacher's academic quality was one of the best reflections of students' best academic performance (Ehrenberg and Brewer, 1994). Rivkin et al. (2005)[21] found that differences in teacher quality predominantly influenced students' reading and math skills.

This study was also in line with Owolabi and Adedayo (2012) who concluded that students taught by teachers with high qualifications produced better academic performance of students comparing to students taught by teachers with lower qualifications. Yusuf and Dada (2016) revealed that there were significant differences on students' academic performance for English subjects between those taught by professional and experienced teachers and those taught by less professional teachers. Yusuf and Dada (2016) suggested that teaching English should be done by teachers who had adequate and experienced qualifications. If it was viewed from system theory, the teacher as one component of education was an important factor in an educational process to create good students as expected at national education goals. It was also related with the theory which stated that the process-output approach consisting of processes, environments, and school structures made differences in students' academic achievement (Witte and Walsh, 1990)[22].

Finally, showed that there was a negative influence on class size on students' academic performance. It means that the big class or class with a lot of students could decrease students' academic performance. Vice versa, the class with fewer students could make classroom more optimal and create better students' academic progress. Learning is complex activity involving various elements; such as, students, teachers, material, curriculum, facilities and infrastructure, environmental conditions, motivation, and others. In general, in the learning process, students are placed in a class. The number of students in a class can vary, from small class to big class.

The study was in line with Monks and Schmidt (2010) [23], they stated that class size and number of students negatively influenced students' academic achievement. This research was also in line with Ehrenberg and Brewer's study (1994). They said that the number of students in the classroom influenced students to understand the subject matter. Big classes have more complex characteristics than small classes. Big classes were more noisy and more interaction among class members; it made the teachers more difficult to control them.

Teachers who taught in big classes needed more time to direct students focus on the learning material.

#### **4 Conclusion**

Based on the results of the study, it can be concluded that education budget played an important role in improving students' academic performance through improving teacher qualification, creating classroom quality and controlling the number of students in the class. Education budget could also improve teacher qualification. The higher teacher qualification, the higher academic performance of students. Education budget could also control class size. Increasing the class budgets would not increase the number of students in a class; thus the class sizes were relatively ideal. The smaller class size, it could improve students' academic performance. The budget also influenced classroom quality. The relationship between education budget and classroom quality was significant but it was anomalous. The relationship between the quality of the lecture hall and teacher qualification was also anomalous. Meanwhile; classroom quality gave a positive effect on students' academic performance.

Based on the conclusions of the study, it is suggested to the local government to provide policies for allocating education budget to improve the class facilities and infrastructure. Teachers and students need good classroom quality since they can provide comfort so they can improve students' academic performance. Then, education budget can provide stimulus for teachers and students which ultimately lead to improve students' academic performance. Then, class size can also influence students' academic performance. Furthermore; the quality of teachers can be the mediating variable of the implementation of education budget, classroom quality, and class sizes to improve students' academic performance. Education budget can also support educational operational activities, including to maintain the quality of teachers, so students' academic performance can be maintained well.

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