

# **Student–Teacher Ratio and Teaching Experience as Determinants of Students’ Academic Achievement In Secondary Schools**

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## **Abstract**

*Students’ academic performance is determined by many factors including provision of teaching learning resources, home based factors and teacher-student motivation among other factors. This study sought to establish the effect of students-teacher ratio and the teacher’s teaching experience on students’ academic achievements in public secondary schools in Machakos County. The research design adopted was descriptive survey with 369 principals, 115,132 and 4,267 teachers as the target population. A sample of 37 principals, 397 students, and 390 teachers were selected using probability sampling techniques. Data was collected by the use of three sets of questionnaires. With the help of Statistical Package of Social Sciences (SPSS) Version 28 quantitative data was analyzed by the use of descriptive statistics (mean, mode, standard deviation, frequency tally and percentages) and also inferential statistics (ANOVA). Findings showed that; there is no statistically significant relationship between student-teacher ratio and students’ academic achievement ( $p = .597$ ) and there is statistically significant relationship between teacher experience and students’ performance ( $p = .000$ ).*

**Key Words:** *Student-Teacher Ratio, Teaching Experience, Students’ Academic Performance*

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## **I. INTRODUCTION**

Determinants of students’ academic achievements have been a major discussion by policy makers, educational stakeholders and educators. Many studies have been done including Papay and Kraft (2014) identified that teachers who have teaching experience of not less than three years as “novice teachers simply trying to survive in the classroom as they build key classroom management skills, learn the curriculum, and add to their instructional abilities”. There are some problems which hinders teachers from getting teaching experience commensurate over various years of teaching in classrooms. Such challenges involve but not limited to inadequate teacher professional documents, poor grasp of curriculum and content knowledge, inadequate or appropriate mentorship programmes in learning institutions, poverty levels of learners, inadequate school resources/infrastructure, lack of teacher motivation, poor remuneration, unreasonable and untimely teacher transfer. In the 3<sup>rd</sup> world nations including Kenya there are more constraints for teachers as they acquire experience than in established nations’ economies which negatively effect on student academic performance.

### **1.1 Statement of the problem**

The overall performance for Machakos county has been below 5.00 (C-) for the 2018 -2020 period. These shows that most public secondary schools have had poor performance. As per the County Director of Education (CDE) office report there has been an outcry due to dismal performance of students in national examinations in secondary schools. The public secondary schools in Machakos County have performed poorly in KCSE over the years as showed in table 1.1.

**Table 1.1: Students’ academic performance in KCSE**

Year	2018	2019	2020
Average Mean Score	3.971	3.8607	3.544

Source: The County Director of Education, Machakos County.

### **1.2 Purpose of the study**

The purpose of this study was to establish the effect of students-teacher ratio and the teacher’s teaching experience on students’ academic achievements in public secondary schools in Machakos County

### **1.3 Objectives of the study**

The following objectives guided the study.

- i) To examine the relationship between students-teacher ratio and students’ academic achievements in public secondary schools in Machakos County.
- ii) To determine the relationship between teachers’ teaching experience and students’ academic achievements in public secondary schools in Machakos county.

## **II. Review of Related Literature**

The literature review was done thematically as per the objectives of the study as discussed below.

### **2.1 The relationship of students’ – teacher ratio on learners’ academic achievements**

Achievement in education is the educational result that that show the extent to which the specific goal of education has been achieved in a school environment. This is normally illustrated in terms of students’ scores and grades in test examinations or assignments. Maguson (2007) describes academic achievement as commonly measured by examination or continuous assessment but maintains that there is no general agreement on how achievement academic is best tested

In the research study conducted by Shah and Inamullah (2012) asserted that congested classrooms can have direct impacts on the learners learning process. They not only impact learners’ academic achievement but also the teachers had to encounter several problems such as behavioral problems, indiscipline, poor health and poor performance of learners. Ijaiya (1999) asserted that there was a perception of learners and teachers that congestion reduces the standards of teaching and learning which are indicators for achievement of planning for quality of all levels. Congested classroom is not only the challenge facing education of Pakistan but it has now become a common challenge in the globe in our contemporary life.

Coleman (2007) found out that for enthusiastic teachers, if classes are very large, it is important that as far as possible, the learners should be constantly busy and the tasks should function continuously without repeated intervention from the teacher. On the other hand, many parents, teachers and students have a belief that small group classes are preferable to large ones. Verwimp (1999) conducted a study in Ethiopia and found a negative correlation between the quality of teaching and the learner-teacher ratio. A teacher in the classroom is a major instrument contributing to the enhanced and quality teaching and learning process.

Several studies have associated learners’ academic performance with the class size in taught subject such as reading and mathematics, but studies on the effects of pupil-teacher ratio on pupil’s performance have not reached definitive conclusions. In relation to this study, therefore there is need for a study in a locale to fill the gap and shed light as well as giving an insight of the influence of pupil-teacher ratio on performance. The major focus of that study was on the importance of finding out the relationship between the learner-teacher ratios on students’ academic performance in public secondary schools in Machakos County

### **2.2 Influence of teachers’ teaching experience on students’ academic achievement**

In a research conducted by Papay and Kraft (2014) it was found out that teachers who have teaching experience of not less than three years as “novice teachers simply trying to survive in the classroom as they build key classroom management skills, learn the curriculum, and add to their instructional abilities.” There are some problems which hinders teachers from getting teaching experience commensurate over various years of teaching in classrooms. Such challenges involve but not limited to inadequate teacher professional documents, poor grasp of curriculum and content knowledge, inadequate or appropriate mentorship programmes in learning institutions, poverty levels of learners, inadequate school resources/infrastructure, lack of teacher motivation, poor remuneration, unreasonable and untimely teacher transfer. In the 3<sup>rd</sup> world nations including Kenya there are more constraints for teachers as they acquire experience than in established nations’ economies which negatively affect student’s academic performance.

A number of researchers have asserted that students who are taught by teachers with minimal teaching experience register poor academic results in their national examinations compared with students taught by teachers who have more experience of many years in the profession (Boyd et al. (2008); Harris &Saass, 2007;

Papay& Kraft, 2007). On the other hand, teachers with teaching experience of more than 25 years are in some circumstances found not to be as effective as less experienced teachers. Rice (2010) indicated several institutions recognize experience as a factor in performance of various tasks. Teaching experience is traditionally considered as a system influencer for enhanced student academic performance in a school, and has for a long time informed more human resource decisions on teacher payment, distribution, promotions, and transfers including extension of service contract terms beyond retirement age for long-serving certificated teachers in Education sector. Hariss and Sass (2008) indicated that the working experience in the teaching experience has important impact on students’ academic performance. According to the study done by Strauss and Vogt (2001), they asserted that teaching experience is a vital factor which determines the learners’ academic performance in national examinations.

Odumbe, Simatwa and Ayodo (2015) asserts long experience of teaching among the teachers improves the academic performance of the learners placed in their hands. The long teaching career experience aids in improving the teachers’ lesson preparation and keen on learner digression from performance. Fetler(1999) conducted a study and established that various previous publications in education policy analysis journal California on High school staff characteristics and mathematics test results that teacher experience measured by the average number of years in service was positively related to test results. In a study by Rice (2013) found that in CADER Article on evidence of the effects and supply of teacher experience and the indicators for teacher policy that years of teaching experience effects on learner academic performance achievement.

### **III. Research Methodology**

It also targeted 4,267 teachers and 11,134 form four students in the 369 public secondary school in Machakos County. A sample size of 19 principals, 390 teachers, and 397 students was selected using probability sampling techniques. Data was collected by the use of three questionnaires. The data collection tools were piloted in a secondary school in the neighbouring Makueni County where four class teachers and four students from three to four were selected to fill questionnaires of the randomly selected schools. Questionnaires were self-administered by the researcher to facilitate communication with the respondents for the purpose of the study. The researcher physically handed over the questionnaires to the respondents for them to fill in. According to Neuman (2006) the advantage of self-administration of questionnaires is that the survey can be easily undertaken by a single researcher.

Descriptive statistics were conducted using frequency, percentage, and standard deviation. This assisted the researcher to observe trends in the data, which triggered further statistical procedures to make conclusions. Inferential statistics were further used to determine the relationship between variables.

### **IV. Results**

#### **4.1 Students’ - Teacher Ratio and Academic Performance**

The first objective examined the relationship between students’ - teacher ratio and students’ academic achievements in public secondary schools in Machakos County. The principals and teachers were asked to indicate the number of students in a class. Findings are presented in Table 1.2

**Table 1.2: Number of Learners in a Class**

Number of Learners in a Class	Principals		Teachers	
	Frequency	Percentage	Frequency	Percentage
20 - 29	1	5.3	32	13.1
40 - 49	13	68.4	124	50.6
50 - 59	5	26.3	60	24.5
75 and above			29	11.8
<b>TOTAL</b>	<b>19</b>	<b>100</b>	<b>245</b>	<b>100</b>

Findings show that more than half of the principals (68%) and teachers (50.6%) opine that the classes have between 40-49 students. This implies that the teacher-pupil ratio in majority of the public schools is above the recommendation of 40:1. The classrooms are hence congested which could be difficulty to manage particularly in terms students’ discipline, checking students’ notes, assignments, and marking exams. Large classroom sizes are known with increases in learners’ disruptive behaviour and inattention which duty teachers more and result in poor learner academic outcome. Therefore, teachers in such schools do not focus more on needs of individual students particularly slow learners hence their performance would continue to deteriorate. Findings concur with Yusuf, Onifade and Bello (2016) reports that the sizes of classrooms could have negative impacts on the learners’ general behavior, attitude and learning academic results. Teachers were further asked whether teacher - student ratio affect academic achievement. Findings are shown in Table 1.3

**Table 1.3: Responses on whether Teacher-Student Ratio R affect Academic Achievement**

Responses	Frequency	Percentage
Yes	243	99.2
No	2	0.8
<b>Total</b>	<b>245</b>	<b>100</b>

Findings show that nearly almost the teachers opined that teacher - student ratio affect academic achievement. As shown in Table 1.4, student-teacher ratio results to inability to check books for every student, poor student supervision during group work, lack of physical contact between teachers and students, teachers' work overload, time wastage, and inability to assess students' performance frequently. Findings are in agreement with Shah and Inamullah (2012) that congested classrooms affect the learning process. The teachers encounter several problems such as behavioral problems discipline and poor performance of learners.

**Table 1.4: Effect of Student-Teacher Ratio on Students' Academic Achievement**

Effect of Student – Teacher Ratio	Frequency	Percentage
Teachers are not able to check students' books	196	80
Poor students' supervision during group discussions	180	73.5
A lot of time used in solving indiscipline cases	145	59.2
Lack of physical contact between teachers and students	139	56.7
Teachers are overworked in terms of lessons taught	135	55.1
A lot of time used in other duties apart from academics	130	53.0
Teachers are not able to assess students frequently	115	47.0

**Table 2: ANOVA Results for Student-Teacher Ratio and Students Performance**

	Sum of Squares	df	Mean Square	F	Sig
Student – Teacher Ratio Between Groups	3.538	4	.884	.693	.597
Student – Teacher Ratio Within Groups	305.020	239	1.276		
<b>Total</b>	<b>308.557</b>	<b>243</b>			

Table 1.5 shows that ANOVA( $F(4,239) = 0.693, p = .597$ ). The  $p > 0.05$  implying that there is no statistically significant relationship between student-teacher ratio and students' performance. This implies that students' performance is not affected by the student –teacher ratio. This means that although there could be high students' ratio and few teachers, the students try to make good use of the available teachers. Findings could also imply that the few teachers in the school are very committed to their work and use their spare time to attend to students hence the gap in the teaching staff does not have a significant effect on students. Findings are in support of Verwimp (1999) who found an insignificant relationship between quality of teaching and the learner-teacher ratio. Additionally, Ijaiya (1999) found a weak relationship teacher adequacy and quality education.

#### 4.2 Teacher Experience and Academic Performance

The second objective sought to determine the relationship between teachers' years of experience and students' academic achievements in public secondary schools in Machakos County. The principals, teachers and students were asked to tick the extent to which various teacher factors affect students' academic achievement. Findings show that all the principals indicated that; teacher's qualification affect students' academic achievement to a great extent ( $m=4.05$ ), teachers' year of experience affect students' academic achievement to a great extent ( $m=3.74$ ), teachers' workload affect students' academic achievement to a great extent ( $m=3.84$ ), and opportunities for career development affect students' academic achievement to a great extent ( $m=3.53$ ).

Teachers findings show that all the teachers indicated that; teacher's qualification affect students' academic achievement to a very great extent ( $m=4.36$ ), teachers' year of experience affect students' academic achievement to a very great extent ( $m=4.30$ ), teachers' workload affect students' academic achievement to a great very extent ( $m=4.27$ ), and opportunities for career development affect students' academic achievement to a great very extent ( $m=4.28$ ). This implies that the teachers concur with the principals that teacher factors such as teacher qualification, teacher experience, work overload, and opportunities for development affect students' academic achievement to a great extent. Findings concur with Hariss and Sass (2008) that the working experience in the teaching experience has important impact on students' academic performance. Odumbe, Simatwa and Ayodo (2015) also asserted that long experience of teaching among the teachers improves the academic performance of the learners. Teachers were asked to indicate the number of years since they attended the last professional seminar workshop. Findings are presented in Table 1.6

**Table 1.6: Teachers’ Responses on Professional Development**

Number of years	Frequency	Percentage
0-2 years	10	4.1
3-5 years	195	79.6
5 years and above	40	16.3
<b>Total</b>	<b>245</b>	<b>100</b>

Findings show majority of the teachers had attended training more than three year ago. This implies that teachers rarely attend seminars/workshop which may be due to tight working schedules. This implies that the teacher feels that frequency at which the teacher service commission organizations workshops and seminars is not satisfactorily. This could be due to the fact that only a few teachers are recommended to participate in the workshops and seminars per schools and increasing the frequency would ensure that many teachers have a chance of participating in the workshops and seminars. Hence the need to embrace training continuously so that teachers’ skills are enriched for productive performance of tasks

Teacher work load is related to the number of lesson they teach per week. Teachers were therefore asked the average number of lessons they teacher per week. Findings are presented in Table 1.7.

**Table 1.7: Teachers’ Responses on Average number of lessons per week**

Average number of lessons per week	Frequency	Percentage
15 and below	10	4.1
16 -25	35	14.3
25 – 26	117	47.7
36 and above	83	33.9
<b>Total</b>	<b>245</b>	<b>100</b>

Results show that majority of the teachers teach more than 26 lessons weekly. This is an indication that the teachers work for more than 16 hours per week. The findings may imply that the teachers are dedicated to their work and work for many hours to cover syllabus on time. However, while this may enhance students’ academic performance, it may also lead to burn out. Findings are in line with Adika and Sika (2019) who indicated that teachers with maximum lessons per week do complete the syllabus by end of term three and hence had high influence on students’ academic achievement.

**Table 1.8: Teachers’ Response on teachers’ experience**

	Sum of Squares	df	Mean Square	F	Sig
Teacher Experience Between Groups	20.091	3	6.697	5.599	.001
Teacher Experience Within Groups	287.069	240	1.196		
<b>Total</b>	<b>307.160</b>	<b>243</b>			

Table 1.8shows that ANOVA ( $F(3,240) = 5.599, p = .000$ ). The  $p < 0.05$  implying that there is statistically significant relationship between teacher experience and students’ performance. This is an indication that students’ performance is affected by the teacher experience. Experienced teachers have better teaching methods, class management practices and content mastery. Therefore, they have the ability to clarify concepts and deliver curriculum effectively. Findings concurs with Harris and Saass (2007) that students who are taught by teachers with minimal teaching experience register poor academic results in their national examinations compared with students taught by teachers who have more experience of many years in the profession. Aina and Olanipekun (2015) also found that subject matter knowledge, academic qualification, professional development and teaching experience are crucial and significantly related with students’ academic achievement

### Regression Analysis

A regression analysis was conducted to establish how a unit change in the independent variables would cause a change in the dependent variable. Table 1.9 presents the regression analysis results.

**Table 1.9: Regression Coefficients**

Model	Unstandardized coefficients		Standardized coefficients	T	G
	B	Standard Error	Beta		
Constant / Y Intercept	1.547	.314		4.923	.000
Students – Teacher Ratio	.143	.054	.041	.687	.493
Teachers experience	.246	.052	.326	3.042	.003

The regression coefficient shows the expected change in the dependent variable (students’ academic achievement) for a unit increase in the independent variables (student-teacher ratio, teacher experience).

Findings show that; Students' academic achievement =  $1.547 + 0.143(\text{student-teacher ratio}) + 0.246(\text{teacher experience})$ . This means that; for every unit increase in student-teacher ratio increases the students' academic achievement by a value of 0.143 and a unit change in teacher experience increases students' academic achievement by a value of 0.246. The highest strongest predictor of students' academic achievement is teacher experience (3.042) and the weakest is student-teacher ratio (0.687) though it is significant.

From the findings, it is recommended that the ministry of education in conjunction with TSC should improve on the frequency of organizing workshops/seminars and in-service training for teachers. They should also plan the professional development programs during school holidays to ensure that many teachers attend. All teachers should be given equal chances to participate in training irrespective of their teaching subject. The ministry should also support teachers who wish to further studies by giving them incentives if they enroll in public universities. Academic experience is essential in improving teachers' classroom instructional skills and students' academic experience.

### 4.3 Conclusion

The study established that the Teacher-student ratio is high. The schools have inadequate teachers and this resulted to heavy teacher's workload. The teachers also spend quality time marking exams and assignments and they may get tired and give marks that a student does not deserve. The high teacher-student ratio also means that the teachers handles many lessons per week and may also face class management challenges particularly in discipline management. The number of students attended to by one teacher may affect students' performance. The larger the class, the more demanding the class is and individual needs and interests of learners' especially slow ones are not adequately attended to. Teachers teaching experience has a relationship with students' academic achievement. Teachers training is key in enriching their experiences. Teachers are not satisfied with professional development which helps teachers to improve on various skills like classroom management, students discipline management, proper use of teaching aids, students' assessment, content delivery, and teaching methodology. Online learning may help teachers who lack time to study physically in class but this may be challenged by availability on internet in the school compound. The in-service trainings are rarely conducted which denies teacher the chance to develop professionally.

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