



**STUDENT-TEACHER RATIO AND STUDENTS'  
ACADEMIC PERFORMANCE IN PUBLIC UNIVERSITIES:  
THE CASE OF THE UNIVERSITY OF BUEA, CAMEROON**

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**Abstract:**

The study examines the effects of student–teacher ratio on students’ learning and academic performance in public universities in Cameroon. Three constructs of student–teacher ratio, that is, class size, teaching method and teachers’ workload were used to examine the extent to which they affect students’ learning and performance in public universities in Cameroon. A survey research design was used. Closed and open-ended questionnaires were used to collect data exclusively from 39 teachers and 101 students from the University of Buea. The quantitative data was analyzed using the descriptive statistics (frequency count, percentages and mean). The opened ended questions were analyzed using thematic analysis approach with the aid of key concepts/themes, groundings and sampled quotation. Results revealed that class size, teachers’ workload and teaching method as constructs of student–teacher ratio affect students’ learning and academic performance in public universities in Cameroon. Based on the findings, it was recommended that the university administration should construct more classrooms to reduce overpopulated classes; with the increase in student population, educational planners should ensure commensurate increase in infrastructure and qualified teachers. Also, the university administration should ensure that teachers with posts of responsibility should co-teach with those without any posts. This will reduce teacher absenteeism, improve students’ evaluation, and overall students’ performance.

**Keywords:** public universities, student, teacher ratio, students’ learning, academic performance

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## 1. Introduction

Student-teacher ratio in any educational institution has the possibility to determine the class size, individual students' attention, quality of teaching and learning which affects students' performance. With an increase in student population, the class size automatically increases especially in situations where there are inadequate infrastructure and teaching staff, which is usually the case with public schools in Cameroon and other African countries. This is depicted from Table 1 below with a sample from the University of Buea.

**Table 1:** Comparative analysis between total students' enrolment over the years by total number of academic staff, academic infrastructure and capacity of the academic infrastructure

Students enrolments from 2015-2017 compared to the total number of academic staff and infrastructure			Students total enrolment versus total capacity of academic infrastructure		
Year	Total student enrollment	Number of staff	Total number of academic infrastructures	Total capacity of academic infrastructure	Surplus no. of students
2015	19,004	425	43	13,164	5,840
2016	20,732	436	43	13,164	7,568
2017	18,083	443	43	13,164	4,919

**Source:** University of Buea Statistics, 2015-2017.

From Table 1 above, it is observed that from 2015 to 2016, students' enrolment has been on a constant rise by a difference of 1728 students but when compared to the number of academic staff, there was an increase by 11 for the same period of time. This implies that the university recruited additional 11 academic staff to cope with the 1,728 in students increase between 2015 and 2016.

However, comparing students' total enrolment with the number of academic infrastructures for learning and its total capacity from 2015 to 2017, the number of academic infrastructures for learning/lecturers was the same (43) with a capacity of 13,164 students. Yet, the population of students for instance in 2015 was 19,004 which was above the total capacity of the academic infrastructures by 5,840 students. For 2016, with a total of 20,732 student's enrolment, the students' population was above the total capacity of the academic infrastructure by 7,568 students and for 2017, the student's population was above the total capacity of the academic infrastructure by 4,919 students. Increase in class size has a spillover effect on the teaching method, teachers' workload and students' activities, which goes a long way to affect the performance of students.

Students' performance is an indicator of educational quality. According to Nwokocha & Amadike (2005), academic performance of students is the yardstick for testing the educational quality of a nation. Poor performance of students is also an indication of wastage of scarce educational resources and a feedback that the goals and objectives of education have not been attained. It is worse for countries like Cameroon where public universities are highly subsidized by the state. Students in public

universities pay 50.000 FCFA as registration fees except for a few paid programmes. Therefore, poor performance will constitute a huge wastage of resources. Ajani & Akinyele (2014), emphasized that resources are scarce, especially in low income countries; policy makers can ill afford errors in the choice of allocations. To reduce the error margin, the true picture of the determinants of education outcome is desirable.

Most research works on student–teacher ratio in Cameroon are based on primary and secondary education. In practice, there is a great deal of difference of perception between primary, secondary and higher education. This study is expected to be helpful to university authorities to improve on teaching, learning and research.

### **1.1 Problem**

The major factor that determines the outcome of education is students' performance which is the outcome of the teaching – learning process. Universities and other higher educational institutions are the major suppliers of the quality labour force of every society, with high student–teacher ratio; it will be difficult for students to acquire the required skills for employment and labour productivity. According to the National Institute of Statistics, unemployment in Cameroon stood at 75.8% in 2010 with an increase of about 1.7% annually; with this, higher education is lacking in training of skilled workforce (National Institute for Statistics, 2010). The issue of overcrowded classrooms in public universities in Cameroon started in the late 90s when the lone university (University of Yaounde) could not accommodate the social demand for education (Fonkeng, 2010). This gave birth to six state universities following the 1993 reforms on higher education in Cameroon. Few years later, the same situation is still prevailing today in public universities in Cameroon. In the quest for better living conditions and better social status, the demand for university education is on a constant rise. In addition, the staffing situation in public universities has compelled management to resort to large class size (see Table 1 above), especially in general courses so as to make do with the limited staff and available infrastructure. This supports the view of Ajani & Akinyele (2014) that class size is almost an administrative decision over which teachers have little or no control. Large class size may lead to poor student–teacher relationship, poor assessment and evaluation, poor students' participation in academic activities, inadequate teaching methods amongst others that may negatively affect students' performance. This may in the long run lead to high rate of repetition and the acquisition of degrees with low quality; graduates may not be able to defend their degrees in the world of work due to poor acquisition of relevant skills.

On the basis of the above problem, this study seeks to investigate the effects of student–teacher ratio on the academic performance of students in public universities in Cameroon. The specific objectives examine the extent to which:

- 1) Class size affects students' academic performance in public universities in Cameroon.
- 2) Teaching method affects students' academic performance in public universities in Cameroon.

3) Teachers' workload affects students' academic performance in public universities in Cameroon.

Based on the objectives, three research hypotheses were tested:

**Ho1:** There is no significant relationship between class size and students' performance in public universities in Cameroon;

**Ho2:** There is no significant relationship between teaching methods and students' performance in public universities in Cameroon;

**Ho3:** There is no significant relationship between teachers' workload and students' performance in public universities in Cameroon.

### 1.2 Conceptualizing Student – Teacher Ratio

Provision of quality education to students attending higher education institutions poses a major challenge to the education and training systems of most countries (Kaloki, et al, 2016). Cameroon is not an exception to the above assertion. Teachers' performance for the most part is usually evaluated based on students' performance which is a function of quality of the teacher and instruction. However, there are other factors that influence teachers' effectiveness such as student–teacher ratio. Koc & Celik (2015), report that there are external factors that influence the effectiveness of teachers like the number of students per teacher.

Student–teacher ratio is understood by many as class size; though they are similar, they are not exactly the same thing. Class size on the one hand, is the number of students attending a class or in general terms, the average number of students in a classroom while student–teacher ratio on the other hand is the number of students per teacher or in other words the average number of students a teacher instructs in a school (Graue & Rauscher, 2009). The number of students per teacher is usually associated with class size and it is mainly believed that smaller classes provide a better teaching and learning (Koc & Celic, 2014). According to Blatchford & Lai (2012), this belief has been shared by many countries like the USA, European countries, China and Japan and made policies to reduce class size. Policies to reduce class size are generally received well by many; it is generally supported by parents, teachers, administrators and consequently policy makers (Graue, Rauscher & Sherfinski, 2009). One of the most important reasons behind such policies is based on the belief that smaller classes positively impact the academic performance of learners (Koc & Celic, 2014; Fin, 2003, Michaelowa, 2001).

Nevertheless, a school with small class size may not always have a low student–teacher ratio or vice versa. For example, a teacher might teach in small size classes but can be assigned to teach in many classes, in such a situation the class size can be small but the student–teacher ratio can be high and there can also be cases with the opposite situation (Koc & Celic, 2014). This implies that student–teacher ratio has an effect not just on the size of the class, but on teachers' workload. Teachers' workload takes into consideration the total number of students they teach, the total number of teaching hours per week, students' evaluation and individual student attention. Rahman & Avan (2016) reports that teachers' workload in the university includes regular teaching activities like

taking classes, preparing lesson plan, evaluating scripts, attending training programmes and conferences. Though, this may vary with context. For example, in the University of Buea, teachers are also involved in administrative duties, coordinating of teaching programmes and courses, supervision of projects and thesis and supervision of practicum/internship.

As cited in Michael (2001), the Organization for Economic Cooperation and Development (OECD) (1996) report that, student-teacher ratio is a good indicator of teachers' workload and teacher availability to students. As the student-teacher ratio is lowered, the availability of teachers to provide services to students increases. The student-teacher ratio affects both the quality and cost of education. Besides increasing teacher availability, smaller classes have been shown to enhance the opportunity for student evaluation and allow for greater instructional flexibility (Ellis, 1984, in Michael, 2001). This implies that teacher-student ratio affects teachers' quality of instruction, students' attention and method of evaluation which may likely affect students' performance and effective acquisition of skills. Johnson (2011) notes that in schools with smaller student-teacher ratio, teachers can have more time to spend with each student and check the progress of every student they are responsible for and can provide a more individualized teaching that is more suitable to each student.

### **1.3 Research Methods**

A survey research design was used for the study. Instrument for data collection included closed and open-ended questionnaires. The target population consisted of students and lecturers from the University of Buea. Three Faculties were purposively selected for the study – Faculties of Arts, Science, and Social and Management sciences. These Faculties are purposively selected because they are the mother Faculties in the University and they run mostly classical programmes. Simple random sampling technique was used to select students and lecturers for the study. As such, with the increase in students' population over time and the challenges encountered, respondents can better provide the relevant information for the study. Based on this, only full-time lecturers with at least five years of experience and final year students from the selected faculties were used for the study. Data was collected from 101 students and 39 lecturers. The quantitative data was analyzed using the descriptive statistics (frequency count, percentages and mean). The opened ended questions were analyzed with the aid of key concepts/themes, groundings and sampled quotation. The concepts or themes emerged directly from the participants' direct statements meanwhile the groundings represent the number of times a particular concept emanated from the respondents' direct responses/statements. Findings were presented using frequency distribution tables and charts. The hypotheses for the study were tested using the parametric Pearson test of correlation because the data for the study were approximately normally distributed with P-values > 0.05 as revealed by Kolmogorov-Smirnov<sup>a</sup> and Shapiro-Wilk test on the table of test of normality below.

**Table 2: Test of Normality**

Variables	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	P-value.	Statistic	df	P-value.
Class size	.233	101	.200*	.887	101	.104
Teaching method	.151	101	.080	.942	101	.102
Workload	.120	39	.200*	.950	39	.167
Students' academic performance	.172	101	.124	.889	101	.105
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Using the Kolmogorov and Shapiro Wilk test, for a data which is not normally distributed, the P-values will be less than 0.05 and in that case, a non-parametric test will be applied over a parametric test. Testing for normality assumption in study that inferential statistical tests are to be use is very important in other to avoid committing the type 1 or type 2 errors which could lead to faulty generalization.

## 2. Findings and Discussion

### 2.1 Demographic Information

Table 3 below shows the frequency distribution of teachers and students in the University of Buea and the three Faculties (Faculties of Arts, Science, and Social and Management Sciences).

**Table 3: Distribution of Students and Teachers**

Demographic Information	Categories	Frequency		Percentage	
		Students	Teachers	Students	Teachers
Name of University	University of Buea	101	39	100%	100%
Faculty	Arts	34	14	33.7	35.9%
	Science	33	11	32.7	28.2%
	Social and Management Sciences	34	14	33.7	35.9%
Level of Study (students)	400	101	/	100.0	/
Years of Teaching Experience	5-7 years	/	17	/	44.7%
	8-10 years	/	9	/	23.7%
	11-15 years	/	7	/	18.4%
	16 years and above	/	5	/	13.2%

A total of 101 students were sampled for the study from the three Faculties: 34 from Faculty of Arts, 33 from Science and 34 from Social and Management Sciences as seen in Table 1 above. Teachers selected have at least five years of teaching experience; 17(44.7%) of the teachers sampled in the study have been teaching for 4-6years, followed 9(23.7%) for 7-10years, 7(18.4%) for 11-15years and 5(13.2%) for more than 16 years.

These are the mother Faculties in the university and are categorized as classical faculties following the classification by the Ministry of Higher Education in Cameroon.

Classical faculties are faculties which do not offer professional programmes. Nevertheless, the Ministry of Higher Education has put in place measures to professionalize these classical faculties with the strategic objective to provide the Cameroon nation with a human resource that is competent, competitive and diversified to contribute significantly to innovation, production and competitiveness of the economy and the emergence of Cameroon by 2035 (University of Buea, 2018). With high student–teacher ratio which may possibly affect the quality of teaching, teacher workload and class size, it will be difficult for the institution to attain its objective.

## 2.2 Class Size and Students' Academic Performance

Table 4 below presents statistics based on the smallest and largest class sizes of the study.

**Table 4: Class Size**

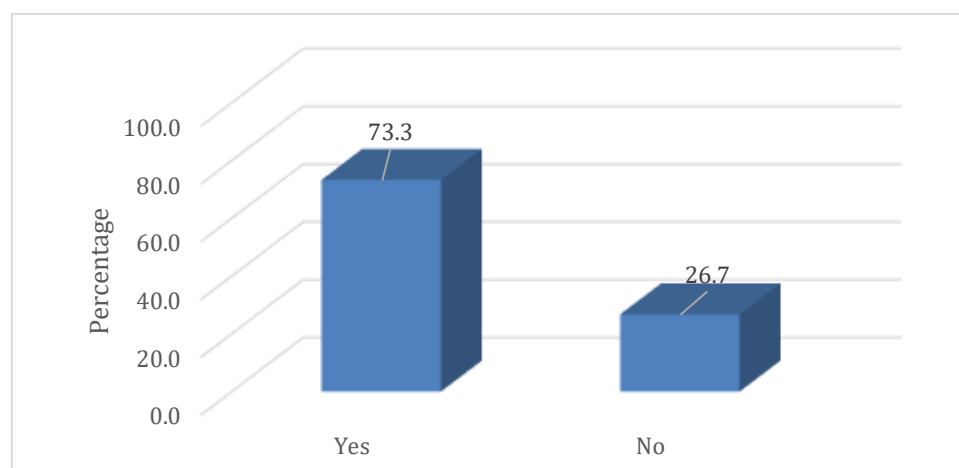
Statistics	Largest class size	Smallest class size
N	100	98
Average	251.12	104.48
Median	200.00	50.00
Minimum	120	50
Maximum	750	600
Std. Error of Mean	19.833	11.500
Std. Deviation	198.327	113.848

With regard to large class size, the largest class size specified by the students was 750, and 12 being the largest for few students. A class size of maximum 120 was specified by students from the Department of English, Faculty of Arts.

With regard to smallest class size, 600 was specified by some students as their smallest class size meanwhile others specified 50. The smallest class size of 50 again was specified by students from the Department of English, Faculty of Arts.

### 2.2.1. Students response on the effects of class size on performance

Figure 1 below presents students' response on whether class size affects their learning and performance.



**Figure 1: Effect of class size on students' learning and performance**

Among the 101 students, 74(73.3%) agreed that class size affects their learning and performance meanwhile only 27(26.7%) of the student disagreed. Table 3 and 4 present this finding in detail.

**Table 5:** Student perception of how class size affects their learning and performance

Effect of class size on student learning and performance	Reasons		
	Themes/ key concepts	Frequency/ grounding	Sampled quotations
Large class size	A lot of distraction	25	<p><i>"Because overcrowded class leads to too much noise thus affecting ones' level of concentration".</i></p> <p><i>"As a result of the large class size, it results to a lot of distraction".</i></p> <p><i>"There is much distraction in large class and this affect performance because students don't focus".</i></p>
	Less attention/ concentration	23	<p><i>"In large class students don't really pay attention in class".</i></p> <p><i>"Large class size affects learning negatively because it reduces concentration in the classroom and stresses the teacher while a smaller classroom is good because you easily learn".</i></p> <p><i>"The large class size affects learning because there is less concentration".</i></p> <p><i>"In large class size, one finds it difficult to neither focus study nor answer questions".</i></p> <p><i>"Large class size lack concentration".</i></p>
	Overcrowded classrooms	19	<p><i>"Due to the lack of space, most students are forced to stand in and out of the halls. They end up leaving without learning a thing".</i></p> <p><i>"Sometimes, I do not really have a sit so I study by standing"</i></p> <p><i>"Large class size does not permit me to have space to sit especially when I come late to class. So, it makes me to stay out of class".</i></p> <p><i>"Because some students stand up while learning due to the size if the class and number of seats".</i></p>
	Noise making	15	<p><i>"As a result of the large class size, it results to a lot of noise and slants during lecturers which reduces the speed of understanding and jeopardize the mood of studies".</i></p> <p><i>"There is usually a lot of noise due to this I face difficulties in hearing and understanding what the teacher is saying"</i></p> <p><i>"The reason is because large class size encourages a lot of noise making during lectures which affects my learning".</i></p>



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	Difficult to hear the lecturer clearly	14	<p><i>"In large class size, it is difficult at time to get what the lecturer is saying"</i></p> <p><i>"In a large class size, I find it hard to hear what the teacher is saying if I am sitting at the back".</i></p> <p><i>"When the class size is large, it is some time difficult to hear the teacher voice due to noise".</i></p>
	Difficult to maintain class control / Classroom management	9	<p><i>"Controlling a large class is a kind of strenuous and thus making teachers to be less patients"</i></p> <p><i>"Large class size lacks adequate control. That is control becomes difficult".</i></p>
	Inadequate teacher-student interaction	6	<p><i>"Also, there is limited student-teacher interaction in large class size".</i></p> <p><i>"Large class size affects student-teacher interaction. It makes it difficult for students and teacher to adequately interact".</i></p>
	Strenuous for teachers	6	<p><i>"Teachers don't exercise patience since its strenuous teaching in large class size hence, students mostly perform poorly".</i></p> <p><i>"Large class size stresses teachers a lot to teach".</i></p>
	Rich in diversity of ideas	1	<i>"When the class size is large, there is diversity in ideas and suggestion especially in solving problems".</i>
	More interaction is attained	1	<i>"The larger the class, the more interactive and communicative the lessons".</i>
<b>Small class size</b>	Students concentration/ attention is high	19	<p><i>"In small class size, it is easy to concentrate when the teacher is there because nobody makes noise without being identified".</i></p> <p><i>"Yes, in small class size, students' attention is gain more".</i></p> <p><i>"In small class size, students pay more attention</i></p>
	Foster teacher-student interaction	15	<p><i>"Yes, because the smaller the class size, the better the level of interaction with the teacher during lectures".</i></p> <p><i>"With small class size, one can easily interact with teachers and others".</i></p> <p><i>"Yes, because with small class size, there is a chance effective students-teacher relationship"</i></p>
	Attention given to students' individual needs	12	<p><i>"This is because with small class size, teachers' pay more attention to the needs and limitation of their students. Thus, enhancing their performance".</i></p> <p><i>"With small class size, students' problems can easily be addressed by teachers".</i></p>
	Ease class control	4	<i>"When the class is small, it gives the teacher less stress and he/she explains better".</i>

Among 74(73.3%) of the students who said class size affects their learning and performance, with regard to large class size, the frequently mentioned factor was distraction *“as a result of the large class size, it results to a lot of distraction”*, less concentration *“large class size affects learning negatively because it reduces concentration in the classroom and stresses the teacher while a smaller classroom is good because you easily learn”*.

Another factor includes study while standing *“due to lack of space, most students are forced to stand in and out of the halls. They end up leaving without learning a thing”*. Students also had a problem of noise making and difficulties in getting the lecturers voice clearly in large classes. Other disturbing factors associated with large class size were difficulty in maintaining class control hence preventing adequate interaction between teacher and students.

Besides these negative factors associated with large class size, some positive factors were highlighted by students, which include diversity in ideas and suggestions especially in solving problems, and more interaction and communication during lesson. For small class size, the factors depicted from the students' statements were all positive with more attention (19) and support adequate teacher–student interaction (15) being the frequently mentioned factors, followed by supporting individual attention to be given to students and lastly ease class control. Table 6 below presents students' response on small class size and students' performance.

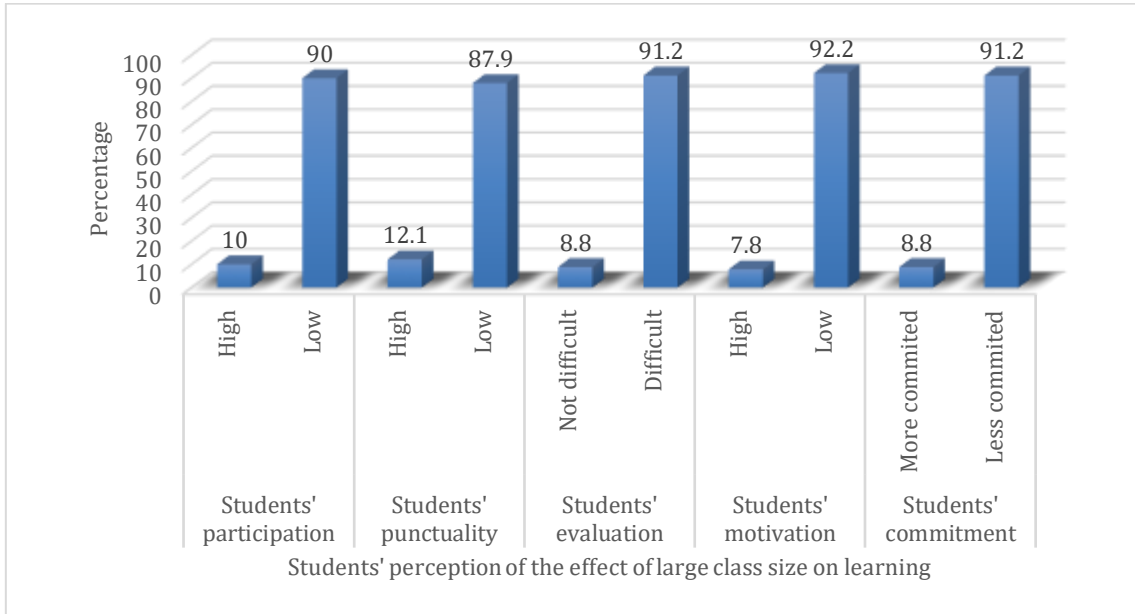
**Table 6:** Students who said class size does not affect their learning and performance

Themes/key concepts	Frequency/ Grounding	Sampled quotations
Pay adequate attention/concentration in class	11	<i>“I grab materials taught in class irrespective of how noisy or small a class may be as long as I am attentive”.</i> <i>“Learning and studies is based on determination and focus. Having this in mind, no matter the size of my class, it does not affect me”</i> <i>“No, because I focus on the lecturer and not the class”.</i> <i>“No, this is because when I am in class, I choose to stay focus and pay more attention to the lecturer teaching rather than fooling around”</i>
Unchanged learning conditions	1	<i>“We have the same lecturers and same learning conditions”.</i>
Students responsible for their own learning	1	<i>“Performance is dependent mainly on the students”.</i>
High determination for studies	1	<i>“Study alone is based on an individual determination. Therefore, be it large or small, the class size can never influence my learning and academic performance”</i>

Among the 27(26.7%) students who said class size does not affect their learning and performance, their reasons could be seen on the table 6 above whereby most of them pay adequate attention/concentration in class, as depicted in the statement of one student *“No, this is because when I am in class, I choose to stay focused and pay more attention to the lecturer teaching rather than fooling around”*. Few of these students are already used to the

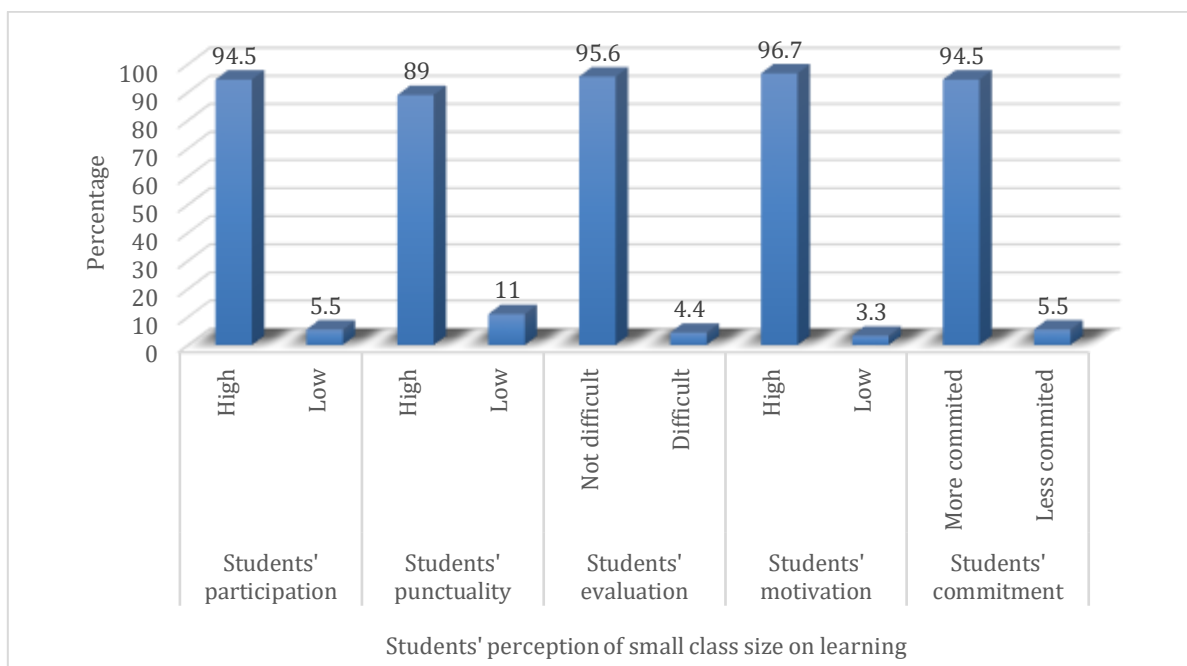
learning situation because to them, the condition of learning has not changed over the years, while others see students as being responsible for their learning.

Figure 2 below presents how large class size affects students' performance.



**Figure 2:** Effects of large class size on students' learning and performance

The finding shows that large classes affect learning negatively. For instance, 81(90%, 80(87.9%) and 83(92.2%) of the students said students' participation, punctuality and motivation are low respectively meanwhile 83(91.2%) and 81(91.2%) of the students said evaluation is difficult and students' commitment will be less respectively in large classes. Figure 3 below presents the effects of small class sizes on students' performance.



**Figure 3:** Effects of small class size on students' learning and performance

Comparing this finding to that of large class size, small class size affects learning positively whereby 86(94.5%), 80(89%), 83(96.7%) of the students said classroom participation, punctuality and motivation are high respectively meanwhile 83(95.6%) and 81(94.5%) said evaluation is not difficult and commitment is high in small classes.

**Table 7:** Students view of large class and small class sizes on learning and performance

Test items	Strongly agree/agree	Disagree/strongly disagree
Larger class size has more discipline problems than small class size.	94 (96.9%)	3 (3.1%)
Smaller classes have a positive effect on student-teacher interaction and students' performance.	95 (96.9%)	3 (3.1%)
Teachers find it difficult to evaluate large flow of students	90 (91.8%)	8 (8.2%)
My performance is better in small class sizes	84 (85.7%)	14 (14.3%)
Smaller class size encourages individual students' attention	91 (92.9%)	7 (7.1%)
<b>Multiple response set</b>	<b>454 (92.8%)</b>	<b>35 (7.2%)</b>

In aggregate, finding shows that small class size has a positive effect on students' learning and performance than large class size as agreed by (92.8%) of the students. For instance, 94 (96.9%) of the students agreed that larger class size have more discipline problems than small class sizes and that a smaller class size has a positive effect on student-teacher interaction and performance. Also, 90(91.8%) of the students agreed that teachers find it difficult to evaluate large flow of students, student's performance will be better in smaller class sizes 84(85.7%) and small class size encourages individual students' attention 91(92.9%).

**Table 8:** Difficulties encountered in large classes as perceived by students

Difficulties encountered by students in large classes	Frequency/grounding
A lot of distraction/less concentration/attention	53
A lot of noise making	32
Difficulties in hearing the teacher clearly	16
Lack of sitting space	15
Limited interaction between teacher and students	15
Students individual difficulties are not addressed	13
Over crowding	12
Limited participation from many students	12
Class control becomes difficult	12
Studying while standing	11
Late coming	11
Affect students' motivation negatively	5
Spread of disease	2
Low academic performance	2

The students identified 14 difficulties encountered by large class size, the frequently mentioned difficulties associated with large class size was lot of students' distraction, noise making, difficulty in hearing the teachers voice, lack of sitting space, limited teacher-student interaction, difficulty in addressing students' individual needs, overcrowding, limited student participation in class, difficulty in maintaining class control, study by standing, late coming, affect students' motivation to study negatively, support the spread of disease and low students' performance.

### 2.2.1. Teachers' response on the effects of class size on performance

**Table 9:** Teachers' view of large class and small class size on students' performance

Test items	Strongly agree/agree	Disagree/strongly disagree
Large classes have more discipline problems than smaller classes.	38 (97.4%)	1 (2.6%)
Smaller classes have a positive effect on student-teacher interaction and students' performance	39 (100.0%)	0 (0%)
Teachers find it difficult to evaluate large flow of students	38 (97.4%)	1 (2.6%)

Just like the students, majority of the teachers 38(97.4%) agreed that large class size have more discipline problems than small class and teachers find it difficult to evaluate large flow of students meanwhile all the teachers 39(100%) agreed that smaller classes have a positive effect on student-teacher interaction and student performance. Table 10 below illustrates teachers' opinion on the effects of class size on students' performance.

**Table 10:** Teachers' perception on the effects of class size on students' performance

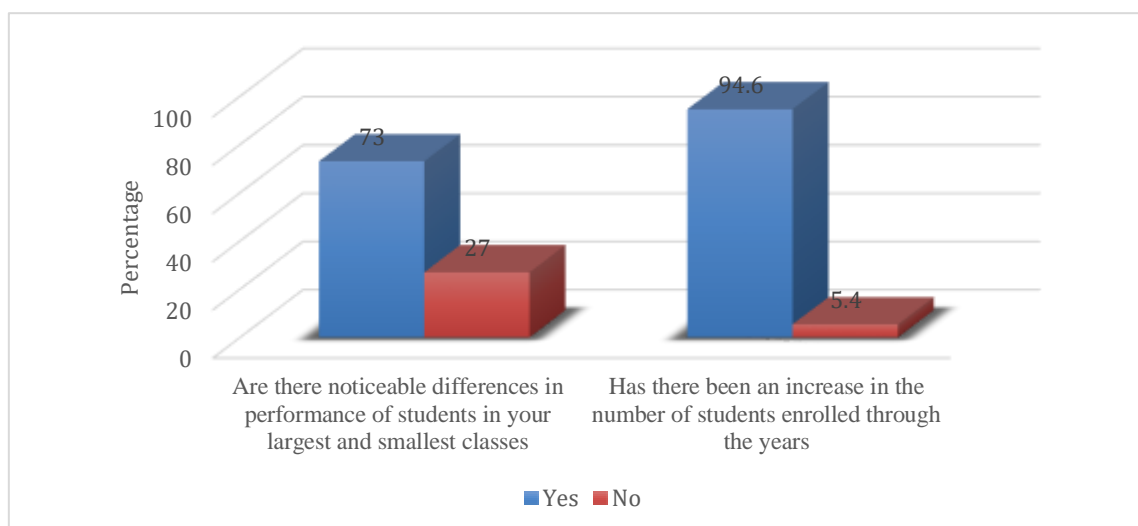
Class size	Themes	Grounding/ frequency	Sample quotations
Large class size	Lot distraction	22	<i>"Students' performance is adversely affected by class size because most of the class size is large and students are distracted by friends".</i> <i>"Too much distraction as such many students ends up not getting anything in a lecture and will affect their result".</i> <i>"Many students do not concentrate during lectures since most of them stand outside and do not even get what I teach because of distance and populated classroom which is very noisy".</i>
	Limit students' participation	6	<i>"Large class size affects students' participation negatively in class".</i>
	Indiscipline problems	3	<i>"With large class size, there is high tendency for students to be indiscipline in classes.</i> <i>"When the class size is large, it creates disorder".</i>
	Student pay less attention in class	2	<i>"In large classes, students don't pay attention as a result when an exam or CA is given, performance will be low or poor".</i>

	Poor evaluation	1	<i>"Poor evaluation in common with large class size by teachers".</i>
<b>Small class size</b>	Effectively support cooperation among student	1	<i>"This is because there will be more effective cooperation among students when the class size is small".</i>
	More attention is gain	1	<i>"The class size affects the performance of students in that students in small class pay more attention in class than those in large class size".</i>

Teachers' views on how class size affect students' performance was the same to that of the students as shown on Table 10 above. With regard to large class size, the teachers said it affect students' concentration negatively, limit class participation, caused lot of indiscipline problem, poor evaluation and caused students to pay less attention to teaching.

On the other hand, as for small class size, two of the teachers said when class size is small; it supports effective cooperation among students and students gain attention well.

Just like the students, not all the teachers as shown on Table 10 said class size affects students' performance. Among the few lecturers as shown figure 5 below who hold this view reports *"If all the students turn to focus, then they will all make good result despite the class size"* and *"A student who is serious will still be serious irrespective on the size of the class"* while another teacher said *"It may not necessarily affect the performance. It depends on the willingness of the students to learn or study"*.



**Figure 4:** Teachers' perception of how students' performance differs by class size and increase in enrolment over the years

Findings from figure 4 above show that majority of the teachers 27(73%) agreed that there are noticeable differences in the performance of students in their largest and smallest class size and 35(94.6%) of the teachers said that there has been an increase in

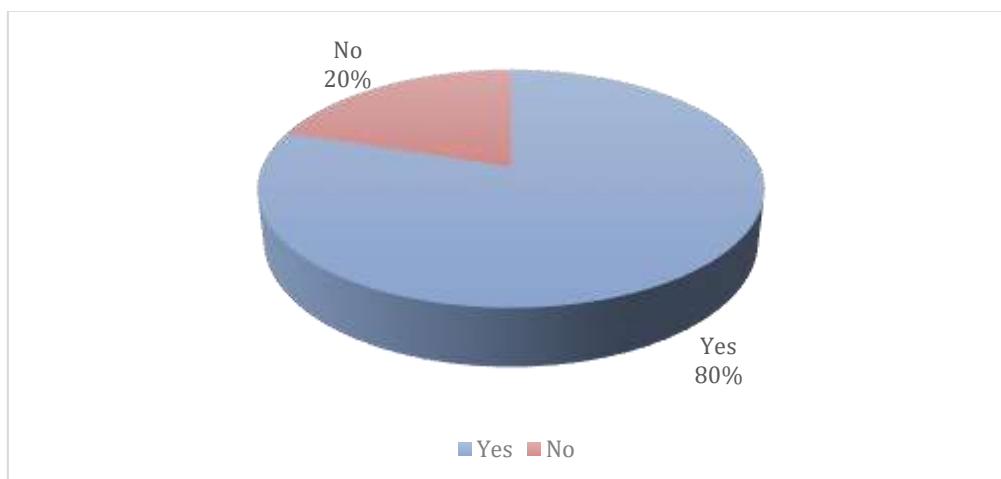
students' enrolment through the years. Table 11 below presents teachers' opinion on the difficulties that students face in large classes.

**Table 11:** Difficulties encountered with large class size as perceived by teachers

Difficulties	Grounding/frequency
Poor sound system/difficulty in getting the teacher voice	21
Lack of sitting space	11
Lot of noise making	10
Lot of indiscipline	9
Limited teacher-student interaction	9
Poor visibility	8
Lot of distraction	5
Limited follow up of students	2
Poor class attendance	1
Theft	1
Poor academic performance	1

Teachers just like students as shown on Table 11 above, identified the same difficulties associated with large class size which are poor sound system, lack of sitting space, lot of noise, and indiscipline, limited teacher-student interaction, poor visibility, limited follow up of students, poor class attendance, theft and poor academic performance.

Apart from the difficulties mentioned above, teachers reported that class size affect their teaching methods as shown in Figure 5 and Table 10 below.



**Figure 5:** Teachers' perception on class size and teaching method

On figure 5, 32(80%) of the teachers agreed that class size affects their teaching method meanwhile only 7(20%) of the teachers disagreed. Table 10 below presents a detailed finding on how class size affects teachers teaching method.

**Table 12:** Teachers' perception of how class size affects their teaching method

Class size	Themes	Grounding/ frequency	Sample quotations
<b>Large class size</b>	Use only lecture method	14	<i>"I am forced to use only lecturer method because of large class size"</i> <i>"The large class size limits me to use just one teaching method which is lecturer method"</i> <i>"The class size limits me to only pure lecturer method"</i>
	Difficult to follow up students	11	<i>"The large class size makes it difficult to properly follow up students"</i> <i>"Large class size causes difficulty in the teaching and learning process"</i> <i>"Large class size makes it difficult for students to follow up"</i> <i>"If the class size was small, it would have been easy for me to attend to the worries and questions of all students in my class"</i>
	Use discussion method	3	<i>"In large class size, I do more of discussion method"</i>
	Difficult to evaluate students	2	<i>"When the class is very large, lecturing, and evaluation of class activities becomes difficult"</i> <i>"Large class size result to poor evaluation"</i>
	Difficult to maintain class control	2	<i>"When the class size is large, there is always poor control and management of the class."</i> <i>"When class size is large, it is difficult to manage the students during lectures"</i>
	Tedious reaching out to all students	1	<i>"When the class size is big, you have to try to reach out to all students and as such it is tedious for the teacher"</i>
	Limited teacher-student interaction	1	<i>"Large class size limits interaction between teacher and students"</i>
<b>Small class size</b>	Effective teaching	2	<i>"In a class of about 50 students, the teaching learning process is good compared to crowded classrooms"</i>
	Attend to students' individual problems	2	<i>"If the class size is small, the teacher will have more time to attend to problems of some individual students"</i>
	Effectively follow up weaker students	2	<i>"Due to the small class size, I have to adopt a more personal and inclusive approach which makes for effective follows up of weaker students"</i>

Findings on Table 12 show that class size has an effect on teachers teaching method as acknowledge by all the teachers. For instance, with regard to large class size, many of the teachers reported that they are forced to use only lecture method *"I am forced to use only lecturer method because of large class size"*,

Others find it difficult to follow up students *"The large class size makes it difficult to properly follow up students"*, use only discussion method *"In large class size, I do more of discussion method"*, and some find it difficult to evaluate students and to maintain class control.

For small class size, teaching method becomes effective as a few of the teachers said smaller class size enable them to follow weaker students, better attend to students'



individual problems and they teach effectively. According to Ndioho & Chuckwu (2017), when a teacher teaches a class of over 70 students, the teacher is faced with the challenges of class control, assessing and evaluating students, which negatively affect students' performance.

**Verification of hypothesis one:** Class size does not significantly affect students' academic performance.

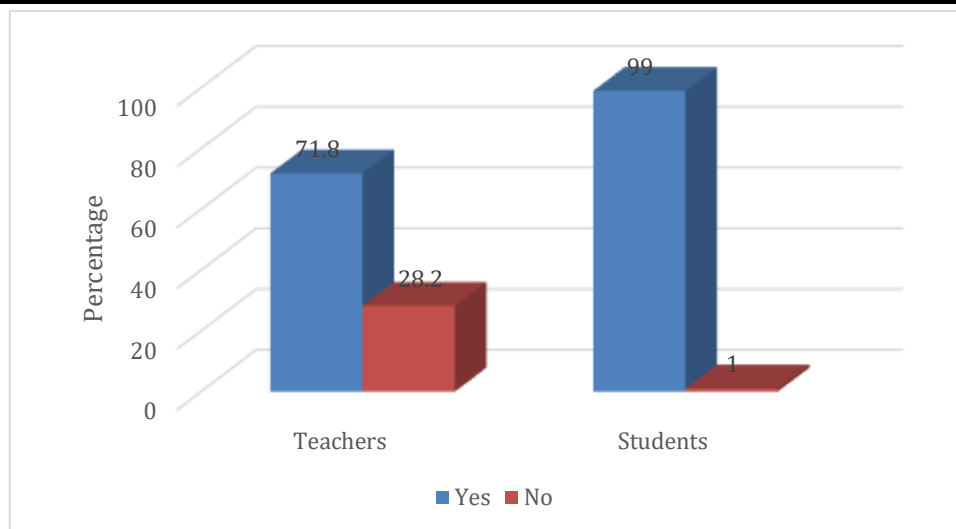
**Table 13:** Relationship between class size and students' academic performance

	Class size	Test statistics	Students' academic performance
Pearson test	Large	R-value	-.397**
		P-value	.001
		N	98
	Small	R-value	.432**
		P-value	.000.
		N	98
**. Correlation is significant at the 0.01 level (2-tailed).			

Findings revealed that there is a very significant relationship between class size and students' academic performance with P-value far less than 0.05 with large class size having a negative effect on students' academic performance ( $R = -0.397^{**}$ ) while small class size having a positive effect on students' academic performance ( $R = 0.432^{**}$ ). This implies that students' academic performance is more likely to decrease with increase in class size and increases with decrease in class size. Therefore, the hypothesis that states class size does not significantly affect students' academic performance was rejected. This result is in line with the research of De Paula & Ponzo (2013) which revealed that large class sizes determines a significant and sizable negative effect on students' performance. Reducing class size and the total number of students per teacher in a semester will lead to a significant improvement in students' outcome.

### 2.3. Effects of teaching method on students' performance

The primary purpose of teaching at any level of education is to bring a fundamental change in learners. For this change to occur, appropriate teaching methods that best suit lesson objectives must be applied by teachers. According to Adunola (2011), regular poor academic performance of majority of students is fundamentally linked to application of ineffective teaching methods by teachers. Figure 6 below explains the perception of students and teachers on teaching methods.



**Figure 6:** Percentage of teachers and students who said teaching method affects the way students learn

Majority of teachers 28(71.8%) and students 87(99%) agreed that teaching method affect the way students learn meanwhile only 1(1%) and 11(28.2%) of the students and teachers respectively disagreed. Table 14 and 15 below present the finding in detail.

**Table 14:** Students' perceptions of how teaching methods affect performance

Themes/key concepts	Frequency/ Grounding	Sampled quotations
- Notes without lectures - Inadequate explanation of concepts	34	<p><i>"A poor teaching method will lead to poor performance and the reverse is true"</i></p> <p><i>"This is because the method of teaching by some teachers is very poor living the students blank at the end of the day".</i></p> <p><i>"Some teachers rush with explanation and students do not understand well".</i></p> <p><i>"Yes, notes without lectures will lower students understanding thus affecting their learning process"</i></p> <p><i>"A lecturer with a snobbish attitude or hate for large class may affect the students' way of learning and comprehending the subject matter"</i></p> <p><i>"A teacher who just gives notes to students without proper explanation makes the students not to really understand".</i></p>
Good teaching method	27	<p><i>"Good teaching method leads to good output".</i></p> <p><i>"Better teaching methods, better output".</i></p> <p><i>"Yes, because students will easily grab concept taught be the lecturer depending on how the concept is being taught"</i></p> <p><i>"A good teaching method like giving good lectures, notes and asking questions will increase students understanding rather than a lecturer who just give notes maybe without explaining"</i></p>
Adequate explanation of concepts Student participation	15	<p><i>"Some teachers are not well explicit in their teaching and when asked many questions about the same topic, they get angry. Some even use examples in their teaching which do not tie with the topic".</i></p> <p><i>"When lecturers given more of handout and does explain it".</i></p> <p><i>"When teacher teaches without given enough explanation".</i></p>

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Difference in learning styles among students	10	<i>"Yes, this is because students have different ways to learn". There are various learners in a classroom setting. So if the teacher teaching method is for one group of learners, the other learners will be neglected. Consequently, the outcome will be poor".</i>
When advance instructional materials are used	4	<i>"It is quite easy to learn from images from videos and other advance means than to imaging what you learn as per the system in our secondary, high and university education".</i>
Mastery of subject matter	2	<i>"This is view in the sense that when teacher is teaching a lesson in which he/she has a good mastery of content, he/she also makes the students understand hence increase performance".</i>
When teachers teach from simple to complex	2	<i>"Yes, if a teacher starts his/her lessons from the simple ones to more complex, students will be encouraged to learn".</i>
In-depth explanation	1	<i>"A teaching method that gives way for more explanation by the teacher".</i>

From Table 14 above, (99%) of the students reported that teaching method affects performance, as envisaged in some of their statements, *"A poor teaching method will lead to poor performance and the reverse is true"* *"This is because the method of teaching by some teachers is very poor living the students blank at the end of the day"*. Also, some teachers do not give adequate explanation of concepts which affects performance, *"Some teachers are not well explicit in their teaching and when asked many questions about the same topic, they get angry. Some even use examples in their teaching which do not tie with the topic"*.

On other hand, some students said teaching method affects students' performance especially when they teach using good teaching method, *"a good teaching method like giving good lectures, notes and asking questions will increase students understanding rather than a lecturer who just gives notes maybe without explaining"*. Performance improve when teachers teach from simple to complex, *"if a teacher starts his/her lessons from the simple ones to more complex, students will be encouraged to learn"*, and also when they have good mastery of the concept *"this is viewed in the sense that when the teacher is teaching a lesson in which he/she has a good mastery of the content, he/she also makes the students understand hence improving performance"*.

Apart from these categories of responses, some other students said teaching method affect students' performance because of differences in learning styles among learners, *"this is because students have different ways to learn"*. *"There are various learners in a classroom setting. So, if the teacher teaching method is for one group of learners, the other learners will be neglected. Consequently, the outcome will be poor"*. For the only student who said teaching method does not affect students' learning as shown on figure 6 above, the reason given is if the students are willing to study.

**Table 15:** Teachers' perception of how teaching method affect students' performance

Themes	Grounding/ frequency	Sample quotations
Poor teaching method	10	<i>"When you use poor teaching methods to teach a lesson, the students face difficulty in understanding the subject matter e.g. notes without explanation, lectures without students' participation, students-teacher interaction, etc". "Teaching practices that do not pass the content of the subject matter well to students encourage poor performance of students".</i>
Good teaching method	9	<i>"A good teaching method where quiz, take home assignment, CA, group presentation, tutorials and practical are use, students will definitely perform well". "Participative method yields more results compare to just lecturing and demonstration method". "When right teaching method is used, and the workload covered students will do well". "Regular assignments encourage students' participation and good performance"</i>
Differences among learners	4	<i>"Different types of learners (e.g. visual, auditory and kinesthetic). This is because in your classroom you have learners of different types".</i>

If students do not understand the content of the lesson, it will be difficult for them to carry out independent studies for better understanding and assimilation of concepts. Teachers' perception of how teaching method affects students' learning was similar to that of the students. The teachers said teaching method affects the way students learn and their performance in terms of class participation, group presentation, pure lecture, continuous assessment (take home assignment, quiz, group presentation), and notes while taking into consideration the different types of learners in class.

On the other hand, some teachers reported that teaching method does not affect the way students learn, it depends on the seriousness of their studies *"Any serious student will follow up the teacher, no matter the teaching method use'.* *"A student who is serious is serious no matter the size of the class".* Therefore, students' learning and performance depends on students input in their studies.

Table 16 below depicts the teaching methods commonly used by teachers and their reasons as perceived by teachers.

**Table 16:** Teaching methods commonly used by teachers and their reasons

Teaching methods commonly used by teachers	Reasons		
	Themes	Grounding/ frequency	Sample quotations
Group presentations	To ensure active students' involvement in the course	7	<i>"I use this method because it makes all students to wholly involve themselves in the course". "This will facilitate the participation of every students"</i>
	Most effective	1	<i>"This is because is most effective for large size classes as all students participate in the lessons".</i>

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Lecture demonstration	To support students' learning	5	<i>"Lecture demonstration to enable student learn" "This is because most at time, you have to tell but stories to students".</i>
	Fit well into the BMP system	1	<i>"These are students-based methods and therefore, fit into the BMP system used at the university".</i>
Cooperative learning method	Fit well into the BMP system	1	<i>"These are students-based methods and therefore, fit into the BMP system used at the university".</i>
Discussion	Large class size	9	<i>"I use more of discussion method because of large class size"</i>
Pure lecture method	Large class size	30	<i>"Because the class size is large and does not permit me to use other teaching methods". "This method is use because of the large class size" "The large class size does not permit me to use other method of teaching".</i>
Drill and practice	No reason	2	
Demonstration	Affordable	5	<i>"Because it is easily reach and affordable".</i>

As shown on Table 16 above, seven (07) teaching method were found commonly used by teachers. Among these seven (07) teaching methods depicted, pure lecture method is the most used with the reason that class size is large. Pure lecture method is a teacher – centered approach to teaching and learning which does not encourage students' participation in their learning and does not support the Bachelors, Masters Ph.D. (BMP) system of higher education in Cameroon. The BMP system emphasized the student–centered approach to teaching and learning which involves lectures, tutorials and practicals. In this process, the teacher is a facilitator and it encourages student–teacher interaction during lessons. The second most used method was discussion method still because class size is large. Group presentation was the third method because it enables active student involvement in a course and because the class size is large. Lecture demonstration was the fourth with reason that it supports students' learning and fit well into the BMP system. Cooperative learning method, drill and practice and demonstration were the least teaching methods used as captured in the statements of few lecturers. This is in line with the research work of Ganyaupfu (2013) on teaching methods and students' performance of undergraduate students, the study revealed that student–teacher interactive teaching method was most effective while teacher – centered approach was least effective.

**Verification of hypothesis two:** Teaching method does not significantly affect students' academic performance

**Table 17:** Relationship between teaching method and students' academic performance

		Test statistics	Students' academic performance
Pearson test	Teaching method	R-value	.298*
		P-value	.022
		N	98
*. Correlation is significant at the 0.05 level (2-tailed).			

Findings revealed that there is a significant and positive relationship between teaching method and students' academic performance ( $P = 0.022, < 0.05$ ). The positive sign of the relationship implies that students' academic performance increases when the teaching method is good and decreases when the teaching method is poor. Therefore, the hypothesis that states that teaching method does not significantly affect students' academic performance is rejected.

**2.4. Effects of teachers' workload on students' performance**

Teachers' role especially in higher education includes teaching, evaluation, counseling, supervision of students, marking of scripts and classroom management which influence students learning and performance. For teachers to perform their role effectively, it will depend on the total number of students assigned to them, the class size and related duties per week. Table 18 below depicts teachers' workload as perceived by teachers.

**Table 18:** Teachers' workload

	Average workload per week (in hours)	Expected workload per week (in hours)	Number of courses Taught per semester
N	32	32	38
Mean	14.16	16.56	3.26
Median	14.00	14.00	3.00
Minimum	6	6	1
Maximum	30	40	7

The average workload for the teachers was 14.16 and the expected workload was 16.56. Given that the average workload is less than the expected workload, this implies that most of the teachers do not cover their expected workload per week. The average number of courses taught by the 38 lecturers was 3, with some teachers teaching 7 courses per semester while others teach just one. Table 19 below depicts teachers' opinion on how workload affects students' performance.

**Table 19:** Teachers' perception of how their workload affects students' academic performance

Does your workload affect students' academic performance?	Reasons		
	Themes	Grounding/ frequency	Sample quotations
<b>Yes</b> 29 (72.4%)	Pay less attention to teaching	15	<i>"The students are force to do their assignments and study for the lecture". "Sometimes, I do not prepare all my notes and assignment". "My workload gives less time to prepare for lessons".</i>
	Unable to complete course out line	10	<i>"I am not able to finish my work before the end of the semester due to excess workload". "Sometimes, workload is not covered".</i>
	If assigned to a lesser number of courses	2	<i>"If I have fewer courses to teach per semester, I would spend more time with students or their individual academic problems to improve on their performance".</i>
	Difficult to follow up students	10	<i>"Yes, it is difficult for me to follow students' on individual bases'.</i>
<b>No</b> 8 (27.6%)	Normal workload	1	<i>"No, because the workload is ok".</i>
	Dedicated	7	<i>"No, because I do not compromise my workload"</i>

Finding on Table 19 shows that (82.2%) of the teachers agreed that workload affects students' performance meanwhile only (17.8%) of the teachers disagreed. Excess workload makes teachers to pay less attention to teaching, find it difficult to complete their course outlines and follow up of students. For teachers whose workload does not affect students' performance, they had normal workload and are dedicated to their jobs. Table 20 below indicates the difficulties teachers encounter in accomplishing the teaching workload.

**Table 20:** Difficulties teachers encounter in accomplishing their teaching workload

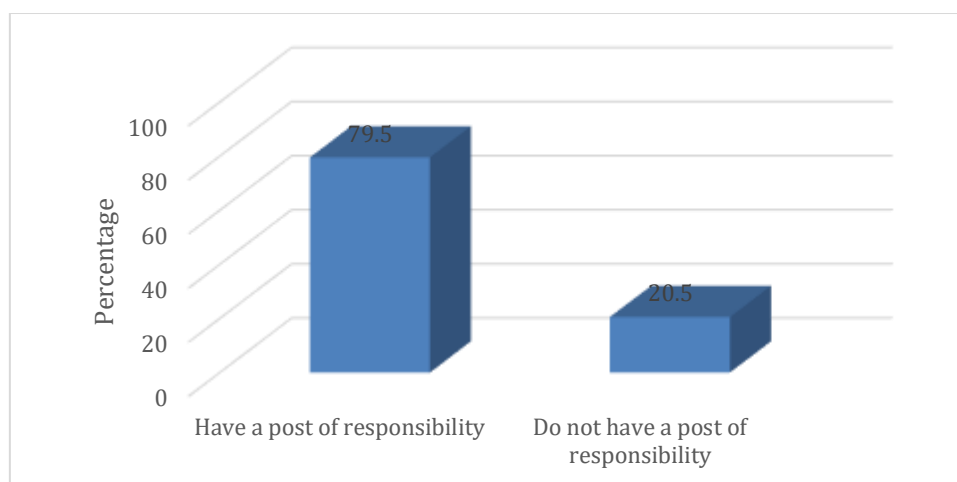
Themes	Grounding/ frequency	Sample quotations
Lack of didactic materials	15	<i>"Lack of teaching materials". "Text books may not be available". "Limited resources".</i>
Time constraint	14	<i>"Time constraint" "Beside the teaching work load, I have research assignment to accomplish as well and have to supervise long essay, masters' thesis and PhD thesis". "Limited number of period or hours given".</i>
Administrative duties	13	<i>"Administrative duties". "Too much administrative duties' "Official duties usually make me to miss lectures once in a while (extra post of responsibility".</i>

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Social unrest	5	<i>"The ghost town days which fall on my teaching days affect me a lot". "The social unrest we are currently experiencing".</i>
Inadequate facilities for research	3	<i>"The necessary facilities to carry out research on the course are not available".</i>
Lack of seriousness from students	3	<i>"Some students are not serious with study". "Not all students attend classes" "Students absenteeism".</i>
Lack of teaching space	2	<i>"Lack of adequate teaching space for some courses".</i>
Class size	1	<i>"Class size".</i>
Holidays within school period	1	<i>"Several holidays within school periods".</i>

As shown on Table 20 above, difficulties encountered by teachers in accomplishing their workload were lack of didactic materials, time constraint, and constraint posed by their administrative duties. These were the frequently mentioned factors. The least mentioned factors were the current social unrest, inadequate facilities for research, lack of seriousness from students, lack of teaching space, class size and occurrence of holidays within school period.

Posts of responsibility was one the major factor reported by teachers that affects teachers' workload. This is depicted in Figure 8, Table 19 below.



**Figure 7:** Percentage of teachers with posts of responsibility

Finding on figure 7 showed that majority of the teachers 31(79.5%) had posts of responsibility meanwhile only 8(20.5%) do not. Table 27 present findings from the perspective of students on how teachers with posts of responsibility differ with those without posts of responsibility in terms of class attendance, evaluation and availability to students.



**Table 21:** Students' opinion on how teachers with posts of responsibilities differ with those without in terms of class attendance, evaluation and availability to students

<b>Teachers with post responsibilities differs with those without differs in terms of class attendance, evaluation and availability to students</b>	<b>Explanations</b>		
	<b>Themes/ key concepts</b>	<b>Frequency/ grounding</b>	<b>Sampled quotations</b>
<b>Yes (95%)</b>	Absent from lectures	32	<p><i>"Most teachers with post of responsibilities are often absent from lectures".</i></p> <p><i>"Yes, administrative activities always clash with class time".</i></p> <p><i>"Yes, because teacher with post of responsibilities don't come to class frequently as compared with those without post of responsibilities".</i></p> <p><i>"Yes, teachers with post of responsibilities are not really available like those without post of responsibilities".</i></p> <p><i>"Yes, teachers with post of responsibilities are rarely available. Sometimes they go for emergency meetings"</i></p>
	Pay less attention in teaching	31	<p><i>"Yes, those with post of responsibilities in some cases turn to pay little attention to their classes".</i></p> <p><i>Yes. Most teachers with post of responsibilities are always preoccupied thus less time is spend for teaching than teachers with no post".</i></p> <p><i>"A Teacher with maybe a post of responsibility of an HOD may decide to use his/her position to give excuses to students".</i></p>
	Come late for classes	12	<p><i>"Yes, because those with post of responsibilities are not always available on time".</i></p> <p><i>"Yes, teachers with post of responsibilities are rarely there at the right time".</i></p> <p><i>No, they are not the same. Those with post of responsibilities come late to class".</i></p>
	Faced difficult in evaluating students	1	<p><i>"Yes, those with post at times usually face difficulties evaluating students' scripts due to the workload and end up giving the scripts to senior students to evaluate".</i></p>

<b>No (5%)</b>	Organize catch up classes	2	<i>“Even if they miss lecturers, they always try to cover up for the time lost”.</i> <i>“No, even if they miss classes, they always try to catch up with lost time”.</i>
	Always available in class	1	<i>“They all are available in classes and they work alongside with those without post of responsibilities”.</i>
	Commitment for teaching	1	<i>“It depends on their commitment to their work. Because some with post of responsibilities are better than those without post of responsibilities”.</i>

Finding here shows that (95%) of the students said teachers with posts of responsibility differ from those without posts of responsibility in terms of attendance, evaluation and availability. The reasons put forward by these 95% of students were that teachers with posts of responsibility absent from classes *“most teachers with posts of responsibility are often absent from lectures”*, pay less attention to teaching *“those with posts of responsibility in some cases turn to pay little attention to their classes”*, come late for classes *“those with post of responsibilities are not always available on time”* and face difficulty in evaluating students *“those with post at times usually face difficulties evaluating students’ scripts due to the workload and end up giving the scripts to senior students to evaluate”*. The same opinion held by the students was the same the teachers complain of.

On the other hand, 5% of the students reported that teachers with posts of responsibility organize catch up classes for lost time *“even if they miss lecturers, they always try to cover up for the time lost”*, and some are always available in class *“They all are available in classes and they work alongside with those without posts of responsibility”*. This implies that few teachers with post of responsibility co- teach with those without posts of responsibility, which reduces teacher absenteeism and increase commitment to their job. Also, with or without post of responsibility, teachers’ effectiveness depends on their commitment to teaching *“It depends on their commitment to their work “and “because some with posts of responsibility are better than those without post of responsibilities”*. Therefore, there is a negative correlation between teacher workload (administrative duties, teaching hours, class size) and students’ learning and performance.

The findings are in line with that of Ndioho & Chuckwu (2017) and Attah & Adebayo (2018) who found a negative correlation between teachers’ workload and students’ performance. Also, results from the work of Hosain (2016) supported that administrative duties and time spent on teaching affects teacher quality and student performance.

**Verification of hypothesis three:** Teachers’ workload does not significantly affect students’ academic performance.

**Table 22:** Relationship between teachers' workload and students' academic performance

		Test statistics	Students' academic performance
Pearson test	Teachers' workload	R-value	-.438*
		P-value	.012
		N	98
*. Correlation is significant at the 0.05 level (2-tailed).			

Findings revealed that there is a significant and negative relationship between teachers' workload and students' academic performance ( $P = 0.012, < 0.05$ ). The negative nature of the relationship implies that student academic performance decreases with increase in teachers' workload and increases with decrease in teachers' workload. Therefore, the hypothesis that states teachers' workload does not significantly affect students' academic performance is rejected. This result supports the work of Rahman & Avan (2016), who reports that too much workload (teaching and non-teaching) negatively affects teaching performance. Excessive workload makes teachers exhausted at the end of the day, which in turn, is destroying the research capabilities and create problems in the work/life balance.

### 3. Conclusion and Recommendations

The study aimed at investigating the effects of student-teacher ratio on students' performance in public universities in Cameroon. Results revealed that class size, teachers' workload and teaching method as constructs of student-teacher ratio significantly affect students' learning academic performance in public universities in Cameroon. Teachers are the principal guarantor of quality education, as such, their activities and quality greatly influence the way students learn and their academic performance.

Based on the findings, the following recommendations were made:

- 1) With an increase in students' population and programmes in public universities, there is need to improve on infrastructural development, especially classrooms. The administration should construct more classrooms to reduce overpopulated classes.
- 2) Educational planners should ensure that with an increase in student' population, arrangements should be made for commensurate increase in infrastructure and qualified teachers. This will reduce class size, enable adequate teachers' workload and encourage student-centered learning. This will go a long way to improve the quality of teaching, learning and performance.
- 3) The university administration should ensure that teachers with posts of responsibility should co-teach with those without posts of responsibility. This will reduce teacher absenteeism, improve students' evaluation, and overall students' performance.

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