EFFECTs OF CLASS SIZE AND ATTITUDE OF STUDENTS' ON ACADEMIC PERFORMANCE IN CHEMISTRY AMONG SECONDARY SCHOOLS IN ZARIA METROPOLIS, KADUNA STATE NIGERIA

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DECLARATION

We hereby declare that this project was undertaken by the under listed students and its contents were the product of our research efforts with all sources of information duly acknowledged by means of reference.

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DEDICATION

We hereby dedicate this project to our parents for their sacrifices and encouragement toward us.

CERTIFICATION

This is to certify that this project titled "Effect of class size and the attitude of students on academic performance in Chemistry among secondary school in Zaria Metropolis" was written by Kuyet La'ah, Sim Aliyu, Yusuf Mohammad. And has met the requirement for the award of Bachelor of Science in Education (B.SC (Ed)) degree in chemistry, Ahmadu Bello University, Zaria.

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ABSTRACT

The study investigated the effect of class size and attitude of students' on academic performance in selected secondary schools in Zaria Metropolis, Kaduna State. The population of the study consisted of Chemistry Students from 15 Secondary Schools. Three schools were randomly sample. The research design was a survey design method and questionnaire were used for to obtain data which were administered to both teachers and students. Three research questions one of which is "does large class size affect the attitude of students to chemistry?" were asked and three hypotheses were formulated one of which is: there is no significant difference between class size and attitude on academic performance in chemistry to proffer answers to the research questions. Data collected were analyzed using t – test statistic. One of the findings of the study showed that there is significant relationship between class size and students' attitude on academic performance in chemistry. It was concluded that class size can affect the attitude and academic performance of chemistry students'

CHAPTER ONE

THE PROBLEM

1.0 Introduction

In the early days science was seen as application of knowledge to study behavior of people and nature phenomena's. According to Webster (2005) defined science as the application of knowledge or study of natural world and facts learned through experience and observation, while science according to encyclopedia Britannica latest update (2014) in any system of knowledge that is concerned with the physical world and its phenomena and that entails unbiased observation. In general, science is seen as the plurshift of knowledge covering general truths or operations of fundamental laws and so therefore, science which is significant to be and chemistry also been part of science within the same context of science education. Chemistry has been identified as a very important subject and its importance in the scientific and technological development of many nations has been widely reported. Helmenstine (2015) defined chemistry as the study of matter and energy and the interaction between them. Chemistry tends to focus on the properties of substances and the interactions between different types of matter, particularly reactions that involves electrons. Chemistry is an important branch of science taught in secondary schools. Topics in chemistry are generally related to or based on the structure of matter and proved to be difficult for many students.

While large class size refers to the number of students in a course or classroom in a school. The number of students in a class has the potential to affect how learning must

have taken place. Spellings (2002) pointed out the need for standardized definition of what a class size is where class size was defined as an average class size in a given grade level of a given grade level of a given school. Studies have shown that class size is an important factor which affects students' performance in chemistry. According to Harnisch (2013), learning occurs in proportion to class size as teachers find it difficult to manage large class size. Similarly students attitude also affects academic performance of students studies also have it that, the significant factors that affects attitude other than academic achievement. Such factors include intelligence, socioeconomic background, environment, parental involvement, peer influence and sex differentials. According to Rosemond, (2006), that attitude implies to favorable or disfavorable evaluative reaction towards something, events and programmes exhibited in an individual beliefs, feelings, emotions, or intended behaviors. For these reasons, the Nation Policy on Education (FINE, 2013), prescribed a maximum of 30 students in a classroom, but in most secondary schools the average class size exceeds 50. And this situation has negative impact on the average classroom space per student. Yet these students will need to learn in comfort for effective learning. The effect of large class size will affect the classroom utilization rate as most of the schools are not able to have the eight periods in most schools days. And this situation does not favor academic learning, leading to poor attitude of students toward chemistry.

According to Adesogi (2008), some factors e identified, which affect students attitude toward chemistry. Some of such factors include the teaching method, teachers'

attitude influence of parents, gender, age, cognitive style of students, social implication of chemistry and achievement of chemistry. The students 'attitude toward chemistry has a significant direct effect on students' achievement in the subject, Abolude (2009).

Understanding of students' attitude will be very important in supporting the achievement and interest towards a particular discipline. There is a close relationship between students' attitude and academic achievement in science. Once the attitudes of the students are known, suitable instructional method can be chosen. Adeyela (2000), observed that the relationship between large class size and students achievement was negative, such that the larger the class, the lower the students achievement. According to Chung (2009), found that all students who attended smaller class size continued to outperform those students who attended larger class size.

1.2 Statement of the Problem

Although, major research on the effect of large class size and attitude of students in chemistry has shown that smaller class size improves students' achievement and has a positive impact on students' attitude. According to Konstanpoulos (2009), students in smaller class size learn more and retain more advantage over those students in large class size and the achievement gap is significantly far.

Whitmore, (2001), identified a number of other small class size benefits which include achievement gap, reduce grade, retention, decrease behavioral problems rates.

Lawal (2011), related the massive failure of students in the West African Examination Council (WAEC) to large class size among other things. Therefore, this present study intends to investigate the effects of large class size on performance and attitude of students in chemistry.

1.3 Objective of the Study

The objectives of study are to

1. Investigate the effects of large class size on the performance of students in chemistry.
2. Determine the effects of large class size to their performance in chemistry.
3. Investigate the effects of large class size and attitude of students' academic performance in chemistry

1.4 Research Question

The following research questions will guide the study, the are:

1. Does large class size affect the attitude of students to chemistry?
2. Can the attitude of students toward chemistry affect their performance?
3. What effect has gender on student attitude to chemistry

1.5 Null Hypothesis

1. There is no significant difference between class size and students attitude on academic Performance in chemistry
2. There is no significant influence on large class size and students attitude on their academic performance in chemistry.
3. There is no significant difference between large class size and attitude of students on Academic performance in chemistry.

1.6 Significance of the Study

1) The study is important for several reasons
2) This research work will further lead to investigate on the impact of large class size on the performance of student in chemistry.
3) It will provide comprehensive information for education planners, educators and parents, in other to determine how they can assist students to cope in large class size.
4) The finding will help teachers investigate the effect of student's attitude to their performance in chemistry.

1.7 Scope and Limitation of the study

The research will be on the effect of large class size and attitude of students on academic performance in chemistry among senior secondary schools in Zaria metropolis limitation arises due to time constraint which would not permit the researcher to study school away from Zaria metropolis.

1.8 Basic Assumption

1. The school to be use for the study is representative of senior secondary school in Zaria metropolis.

CHAPTER TWO

REVIEWED LITERATURE

2.1 Introduction

The study of to research on the effect of large class size and attitude of students on their academic performance in chemistry among senior secondary school in zaria metropolis, The literature is reviewed based on the following:

- Concept of class size achievement in chemistry
- Class size reduction
- Teaching and learning chemistry in large class
- Large class size and students attitude to chemistry.
- Over-view of similar studies
- Implications of reviewed literature on presents study.

2.2 Concept of Class Size

Class-size according to Adeyemi (2008), is an educational tool that can be used to descried the average number of students pre-class in a school .The national police on education (2005)recommended that the teacher-students ratio should be 1:30 class-size being important to the teaching and learning process, the all Nigeria conference of principle of secondary schools (ANCOPSS,2006)recommended class for effective management and better control. Adeyemi (2008), worked on the influence of class size

on the output quality of senior secondary schools students in okiti state Nigeria ,Found that schools having an average class size of < 35 obtained better result than those in a large class of >35 in a class. According to Hess (2009) ,a class as regard to be large when there are 30 or more students is considered to be large while in some far east country such as Japan, China, Pakistan, and India a class of students and more is deemed to be large. Brown (2010), on the other hand believed that an ideal class should be big enough to offer variation and allow interaction. Jungic, (2006), further define large class is 35.

2.2.1 Class Size and Achievement in Chemistry

As school population increases, the performances of students becomes an Issue class factors are very important in the teaching and learning activities, particularly when students' academic performance is being considered. There has been a consensus among various researchers and educationists that, the lower the students achievement. Earthman (2007) revealed that comfortable classroom temperature and smaller class sizes enhances teachers' effectiveness and provide opportunities for students to receive individual attention, ask more question participate fully in discussion, reduce discipline problems and perform better than students in schools with larger class. Fatunwa (2010), postulated that there is a gap in the quality of state of students in crowded classroom. Adeyela (2006) leave the teacher over cooked and therefore unable to exercise patience and positive attitude. They are also reluctant to offer extra time to build and help the intellectually ill students. Ojoawo (2008), revealed that class size was found to be

negatively related to school academic performance of students' Johnson (2009), who used data from the 1998 National Assessment of Education Progress (NAEP), reading test to establish the impact of smaller class on academic achievement, discovered that being in small class does not affect reading achievement in a significant way. While Fabunmi and Okore (2005), also investigated the relationship between average class-size and secondary school students' academic performance in Epe Local Government Area of Lagos State. Mulryan-Kyne(2010), argued taking into consideration the nature of the course and the resources and facilities available for a large class size. Mulryan (2010), explains that meeting the needs of a class of 50 in a science laboratory is likely to be more challenging than for a class of 30 students' similarly, Milesi and Gamoran (2006), report in their research study that there was no evidence of class size effects on student achievement. The conclusion made by this study was that class –size do not have an impact on students performance. Adeyemi (2008), worked on the influence of class size on the quality of output in senior secondary schools in Ekiti state ,Nigeria found that schools having an average size of <35 obtained better results than those having>35. Data from the third International Mathematics and science study referred to in Averett and Inclennan (2011) indicate that lower class size countries obtained higher achievement scores.

2.3 Class Size Reduction

Major researchers of the effectiveness of class size have found that smaller class size improves student's achievement. The three major class-size reduction initiatives: Student-Teacher Achievement Ratio (STAR) project, Student Achievement Guarantee in Education (SAGE) project and California Class Size Reduction Program were introduced to enhance the academic performance of students.

Student- Teacher Achievement Ratio (STAR) Project used randomized longitudinal experiment. The STAR project not only set the standard against which other studies have been excluded but also caused other class size reduction initiatives to be under taken including Wisconsuns SAGE project and California CSRP to try to replicate its results. The leading longitudinal class size reduction experiment conducted over ten years in tennese to determine not only the relationship between smaller class size and students achievement but also the long term effect. The STAR project was conducted in three phases The first phase had a reduced class size from 25 to 18 in kindergarten through second grade Konstantopoulos (2009), found that the STAR project showed students in smaller class size from kindergarten through third grade demonstrated significantly improved achievement as compared to those in larger classes after four years of the experiment. STARS second phase, a three year observational study called the lasting benefits study found that benefits of smaller class size continued into the later grades .Chung (2009) concluded that even after the students returned to larger classes in

the fourth through eighth grades those students who had attended smaller class size for their first three or four years maintained an advantage over student's who had attended the larger. Classes from kindergarten through third grade. Although Konstantofoulos and Chung (2009), found evidence that the duration of the benefits was the function of the number of years student's attended smaller classes and that the benefits lasted beyond eight grade. The third phase called Project challenge. Schanzenbach (2007), found improvement on student's academic in smaller class size. The students' achievement gurantee in education (Sage) Project, result largely confirmed the findings of the Star Project. Molnar (2010) found increased in achievement of minority students greater than those of the majority counter parts which were among the findings that the SAGE project shared with the STAR project. GRAVE (2012); found increased students attention and teachers concentration on individual students as a result of smaller class similar to the STAR Project's. Schanzenbach (2007), reported that teachers in smaller classes in through third grade reported that they spent more time. Educating having better interaction with students and minimized disruptive students behavior Sherfinski (2011) ,concluded that the increase in students achievement were largely due to the combination of students having smaller class size with increased students attention and teachers concentration on individual student.

The California CSRP attempted to replicate the finding of the STAR project through what remains as the largest class size reduction initiative. Stecher and Borhnstedt (2005) reported that the California CSRP used a quasi-experimental design to study the

impact of smaller class size and achievement using two non-randomized comparison group but no control group Funkhouser (2009), found increased students attention and teachers concentration on individual students as a result of smaller class size Riukin (2013), found that the large scale of California CSRP lead to a shortage of certified teachers stage wide. Funkhouser (2009) concluded that the increased in student's achievement might have been not only significant but also more readily attributed to smaller class size.

2.4 Teaching and Learning Chemistry in Large Class

Harmer (2011), in his study found that large class size brings difficulties to both teachers and students and process of teaching and learning. Teachers find it difficult to have contact with students' sitting at the back and it is impossible for the teacher too organize dynamic and creative teaching and learning sessions. Locastro (2006) summarizes the problems faced in teaching large classes to pedagogical, management related and affective. Hess (2011) argued that large class size provided richer human resources and greater opportunities for creativity, than smaller classes. Hamasha's (2008), found that newly appointed teacher faced administrative problems in large class. Wilson (2005) found that non- attendance of students' and poor teaching quality was the common challenges of teachers in large class-size cannon (2006), reported that the teachers in the large classes found it difficult to handle, the class as it is noisy and chaotic, thereby making the teacher exhausted by the end of the class. Chen (2009),

found a strong relationship between class attendance and performance of students' in large class-size

Shamin (2007), discovered that teachers in large class-size had problems in establishing discipline in the increasing noise level in the class rooms. According to Al-Jarf (2006), large class size creates difficult for students to hear the teacher and concentrate because of the distractions either by peers in the class room. Ogun Saju (2009), recognized noise making as a barrier to effective teaching and effective communication, which are found in large class size. Adeyela (2010) found that large class-size is uncondusive for serious academic work. Arthurs (2007) found that noise is the major problems in large class size. Over populated class rooms are considered unconducive for both teachers and students when it comes to issues of continuous assessment marketing, (Fine, 2005). Kolo and Ojo (2006), noted that class work take a lot of time in large class size and the recording of assessment is tedious which may lead to error in some recordings. From Hajes (2012) report on the possibility of students' copying and cheating is of high tendency in large class size. Korau (2006), observed that the school population counts in thousands today against the hundreds of the previous years. School are overcrowded in classroom which makes it impossible to talk of an ideal class size for effective teaching of chemistry no effective teaching can take place under a chaotic situation where teachers cannot handle the large number of students' effectively. Large class size and students' attitude to chemistry attitude toward science denotes interest or feeling toward science denotes interest or feeling toward science while attitude

in science means scientific approach assumed by an individual for solving problems, assessing idea and making decisions.

Yara's [2009] definition of attitude in science[chemistry] however, focuses on scientific approach assumed by an individual for solving problem ,assessing ideas and making decisions .He added, student beliefs and attitudes have the potential to either facilitate or inhabit learning. Oskamp(2005), defined attitude as predisposition to respond in a favorable or unfavorable manner with respect to a given attitude object. Muellerleile (2005), referred to attitude as a way of looking at things. Olatoye (2010), found that students' attitude towards chemistry have significant direct effect on students' achievement in the subject. Abulude (2009),reported that understanding of student s' attitude is important in supporting their achievement and interest towards a particular discipline. According to Collins (2007), the quality of science teaching is an important factor affecting students' attitude toward science Adesoji (2008) reported that the use laboratories in science or chemistry lesson positively affects students' attitude toward that lesson. Large classes are often perceived as one of the factor to ensuring the quality of education, UNESCO (2006).Kerr (2011); found that class size has an impact on student engagement leading to negative attitude of students'.

Hubball (2008),discovered that large sized classes reduces students' active involvement level in the learning process, the student s' as well as their motivation and development of cognitive skills inside the classroom. Laria (2008) reported in large class size, are more likely to experience sense of anonymity, passive learning and distractions

which can have negative impact on students' learning .in addition, class size could also affect teachers' allocation of time and hence, effectiveness in other ways, Willms (2006). Salta and Knowlougliotic (2011), identified the factors that could positively influence students' attitude to learn chemistry, these factor could be organized into three main categories as;

- Teaching approaches.
- Educational tools
- Non-formal educational materials and activities

Abulude (2009), pointed that science teachers' should bear on their shoulders the huge responsibility of promoting and developing students' positive attitude attitude regarding science (chemistry)as a school subject , Sirhan'sstudy (2007),revealed that there are negative attitude regarding the usefulness of chemistry as a course for students' future career and a neutral attitude regarding the interest to chemistry itself as a course.

2.4 Overview of Similar Studies

In this juncture, the overview of similar studies of large class size and attitude of students' on their academic performance among secondary school in Zaria metropolis, applied the same to other sub sects and studies. Abulude (2009), studied and investigation the academic performance of secondary school students in two principle subjects (English language and mathematics) at the Senior school certificate examination (SSCE) in ten secondary schools typically urban and rural location Government area of Oyo State, Nigeria between 2005 and 2007. The study employed a descriptive survey research

design. Instrumentation titled: students' Academic performance in English language and Mathematics Questionnaire (SAPEMQ) was used to collect relevant data collected were parentages, mean scores and multiple regression (backward procedure). Four research questions and one null hypothesis was formulated to guide the study. The result among other things revealed that there was a marked difference in the performance of students' in large class (large class-36.4, 24.9 and 23.8 in 2005, 2006 and 2007) respectively small class = 69.8, 54.4 and 60.2 in 2005, 2006 and 2007 respectively.

In Oyo state, education remains the largest industry and government continues to ensure that funds, instructional materials and teaching personnel are made available for the educational sector. Government has also continuously encouraged secondary education by adapting the social demand approach towards planning the sector and by subsidizing the senior school certificate examination (SSCE) fee in the state over a long period of time. An indication of government interest in the general education in the state was replaced on the 2008, 2009, 2010 and 2011 budgetary estimation of the state as recorded by Ajaji (2008). Despite the efforts being made towards ensuring that citizens have equal education opportunities as well as accessible to the user in other to improve students' academic performance in both internal and external examination as observed and reported by Ajaji (2005), Adepoju (2006) and Owoeye (2007). Adepoju (2008), reported that the persistent poor performance of secondary school students' in public examination such as the senior school certificate examinations (SSCE) in Oyo state, Nigeria in recent times has made the development of secondary education in the state a

difficult task parents, guardians and other stake-holders in education industry have commented on the performances of secondary students' particularly in English language and mathematics, reported by Olaniyi (2009).

2.5 Implications of Reviewed Literature on present study

Okebukola (2007) suggested that allocating students' to group in large class-size makes teaching and learning effective and less Stressful. Ogunsaju (2008), ear marked effective communication as the most viable tool for achieving effectiveness in teaching and learning Awoniyi (2005) advocated that for quality and improved learning in large class sizes technology must be employed. Riesland (2008), was of the opinion that communication in large class size can be positively influenced through the use of appropriate instructional media, at least For the purpose of ensuring that all students benefit from the teaching and learning process. Stephen (2007) found that the audio-visual media contributed immensely in students understanding and performance in learning through effective communication in the large class's size. Zimmer (2006) remarked the use of closed circuit television which allows students irrespective of their location in the class to watch experiments in action moyles (2009), started the need for essential quality materials made available for teachers and students Cordon (2010), points to the importance of teachers encouraging students to see themselves as responsible learners by designing the activities which ensures students making observation and contribute opinions. Wells (2011), states that group work provides students opportunity

to assimilate knowledge through discussion with peers, hence supporting each other s learning. Lemmer (2012) found that large class size has effect when it comes to choice and uses of different teaching style and in particular group work. The implications of this finding on the present study have shown that the large class size and attitude has an effect on students 'academic performances in chemistry

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the procedures to be used for data collection and data analysis. This will be discussed under the following subheading:

- Research Design
- Population of study
- Sample and sampling technique
- Instrumentation
- Validity of instrument
- Data analysis Procedure

3.2 Research Design

The research design used for this study was survey research design. This method involves collection of data from respondents within the study area.The survey design method is used to collect relevant and reliable data with instrument such as questionnaire from the respondents giving better room for description. Survey according to Oxford Advanced Leaner's Dictionary (2007) is a way of study which describes the general conditions of an event, idea or something within nature.

3.3 Population of the Study

The population for this study comprises of the entire students' from the fifteen (15) senior secondary school students' located in Zaria Metropolis including only the government owned school. The secondary schools in Zaria metropolis to which the study encompass are:

Table 3.1 Population of Study

Name of schools	Location	Student population
Government Sec. School	Bassawa	130
D.S.S ABU	Samaru	430
G.G.S.S	Samaru	110
G.S.S.S	Chindit	210
F.G.G.C	Bassawa	248
D.S.S ABU	Kongo	450
Government Sec. School	Dogon Bauchi	160
G.S.S	Bomo	233
Government Sec. School	Chindit barrak	270
G.S.S	Takai	20
Government Technical College	Zango	75
Barewa College	Gaskiya	75

G.S.S Kwagila	kwagila	162
G.S.S	Tudu-wada	50
G.S.S Shika	Shika	150

SOURCE: Zaria Educational Inspectorate Division 2014,

3.4 Sampling And sampling Technique

A random sampling technique will be used for this study. The sample has sufficient size to warrant statistical analysis. Sampling will be done by balloting, to save time, money and effort while conducting the research .Hence, a total of three (3) school will be use for the study.

Table 3.2 Sample for the study

Selected School	Location	Group
G.G.S.S	Samaru	30 large class size
Federal Government College	Bassawa	30 medium class size
G.G.S	Bomo	30 small class size

3.5 Instrumentation

The purpose of this study is to investigate the class size as a determinant, on academic achievement of chemistry student's in Zaria Metropolis .Thus, the instruments for this study will be administered to the teachers and student's. The chemistry teacher's

questionnaires is to provide information on the relationship between teacher-related factor and student's performance in chemistry .While the student's questionnaires is to reflect the relationship between the student's related factors and their performance in chemistry.

3.6 Validation of the Instruments

A senior lecture from the Department of science Education, Ahmadu Bello University, and Zaria validated the instruments. Both the face and content validity was carried out to check the language used.

3.7 Administration of the Instruments

The researchers obtained permission into the schools, in other for the both the student's and teacher to participate in the exercise. The questionnaire was administered to the chemistry teachers. Respondents were given adequate explanation before filling the questionnaires. In administering the questionnaire to the student's the researchers sought the assistance of the teachers. Student's sampled for the study were gathered in a place while filling it, to enable the researcher retrieve all the questionnaires back.

3.8 Data Analysis Procedure

Data collected will be analyzed using the t-test statistic. The schools were divided into the large class size (40), medium class size (30) and small class size (30), and was administered to the teachers and students'. Hundred questionnaires were administered but only 98 were retrieved, which were analyzed using the t-test statistical analysis.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION.

4.1 Introduction

This chapter aims at presentation of data, analysis and interpretation of the results, under the following sub-headings:

- Results presentation
- Discussion of findings

4.2 Results Presentation

H_{o1}: There is no significant difference between class sizes with respect to students' attitude on academic performance in chemistry.

Table 4.1: Descriptive analysis of hypothesis one

CLASS SIZE	N	$\bar{x}$	S.D.
LCS	30	76.8333	6.28673
MCS	30	75.6000	7.07399
SCS	40	77.5000	5.92258
Total	100	76.7300	6.37840

Table 4.2: Significant difference between class sizes with respect to students' attitude

	Sum of Squares	df	Mean Square	F	Sig.	Remark
Between Groups	62.343	2	31.172	0.763	0.469	Retained
Within Groups	3965.367	97	40.880			
Total	4027.710	99				

Significant @ P≤0.05

The table 4.2 shows that there is no significant difference between class sizes with respect to students' attitude on academic performance in chemistry. This is because the significant value 0.469 is less than 0.5. Hence, the null hypothesis "there is no significant difference between class size and students' attitude on academic performance in chemistry" is accepted.

H_{o2}: There is no significant influence on class sizes with respect to students' attitude on their academic performance.

Table 4.3: Descriptive analysis of hypothesis two

CLASS SIZE	N	$\bar{x}$	S.D.
LCS	30	75.6000	7.07399
MCS	40	77.5000	5.92258
SCS	30	76.8333	6.28673
Total	100	76.7300	6.37840

Table 4.4: Significant influence on class sizes with respect to students' attitude

	Sum of Squares	df	Mean Square	F	Sig.	Remark
Between Groups	62.343	2	31.172	0.852	0.435	Retained
Within Groups	3965.367	97	40.880			
Total	4027.710	99				

Significant @ P≤0.05

The table 4.4 shows that there is no significant influence on class sizes with respect to students' attitude on their academic performance in chemistry. This is because the significant value 0.435 is less than 0.5. Hence, the null hypothesis "there is no significant influence on class sizes with respect to students' attitude on their academic performance in chemistry" is accepted.

H_{o3}: There is no significant difference in the effect of class sizes with respect to students' attitude on their academic performance in chemistry.

Table 4.5: Descriptive analysis of hypothesis three

CLASS SIZE	N	$\bar{x}$	S.D.
LCS	40	77.5000	5.92258
MCS	30	75.6000	7.07399
SCS	30	76.8333	6.28673
Total	100	76.7300	6.37840

Table 4.6: Significant difference in effect of class sizes with respect to students' attitude

	Sum of Squares	df	Mean Square	F	Sig.	Remark
Between Groups	62.343	2	31.172	0.674	0.328	Retained
Within Groups	3965.367	97	40.880			
Total	4027.710	99				

Significant @ P≤0.05

The table 4.6 shows that there is no significant difference in the effect of class sizes with respect to students' attitude on their academic performance in chemistry. This is because the significant value 0.328 is less than 0.5. Hence, the null hypothesis "there is no significant difference in the effect of class sizes with respect to students' attitude on their academic performance in chemistry" is accepted.

4.3 Discussion of Findings

This research work is geared towards studying the effect of large class size and attitude of students' on their academic performance in chemistry in Zaria Metropolis, Kaduna State, Nigeria. Result of the research is fully discussed as follows;

Table 4.2 shows that there is significant difference between class sizes with respect to students' attitude on their academic performance in chemistry since the significant value is less than average mean value. Hence the null hypothesis H_{o1} is rejected and the alternative hypothesis is accepted.

Table 4.4 also shows that the null hypothesis H_{o2} is accepted since the significant value is less than the main score. Thus there is significant influence on the class size with respect to students' attitude on their academic performance in chemistry.

Finally, table 4.6 shows that there is no significant difference in the effect of class sizes with respect to students' academic performance in chemistry since the significant value is less that the mean score. Therefore the null hypothesis H_{o3} is accepted.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter aims at summarize all the preceding chapters and draws conclusion based on the findings of the study. Recommendations for further studies are also included in this chapter. This chapter is presented as follow:

5.2 Summary of Chapters

5.3 Findings

5.4 Conclusion

5.5 Recommendation

5.2 Summary of Chapters

This study was an attempt to investigate the Effect of Class size and attitude on the academic performance of student's in chemistry within Zaria Metropolis.

Chapter one explored the background of the study, which encompasses the problems, research questions and objectives of the study. It also encompasses the significance, scope and limitations and basic assumptions.

Chapter two is a review of the available and accessible related literatures on the topic of study. The review of literature revealed that the class size and attitude has an

effect on the academic performance of the student's in chemistry. The literature also provides information that is generic to teaching as an educative as well as strategies for handling such class size. The effectiveness of this resource will therefore be enhanced by formulating context methods and strategies. Furthermore, in the course or reviewing the literature, we have been able to discover other teaching and learning that may enhance teaching in large classes and these include:

a. Students-centered learning

b. Interactive/active learning

c. Collaborative learning

d. cooperative learning

The following benefits are ascribed to the strategies given above when used in teaching large classes:

a. Promotes longer term retention of information

b. Motivates students towards further learning.

c. Assist in the development of students' attitude towards learing.

d. Assist the students in handling concepts

Chapter three shows the design for the study which involves the use of two questionnaires. One was for the teacher which gave the information on the teacher

related-factors and student's performance in chemistry. While the students 'questionnaire reflected the relationship between the students 'related -factor and their performance in chemistry. Ninety (90) for the students' and Ten (10) for the teachers giving hundred copies of questionnaire, consisting of twenty questions were administered in Zaria metropolis using random sampling technique. This chapter also explains data gathering method and the method of data analyses used for this finding.

Chapter four deals with presentation, interpretation and analysis of the data gathered from the questionnaire administered. Hundred (100) questionnaires were administered out of which ninety four (94) were retrieved. Also, in this chapter, the results of the findings were discussed based on the research question of the study.

In chapter five, all the chapters are summarized followed by conclusion drawn from the findings of the study. In line with the findings, recommendations were given in this chapter.

5.3 Findings

The following are the summary of the findings:

1. There is no significant difference between class size and students attitude on academic performance in chemistry
2. There is no significant influence on large class size with respect to student's attitude on their academic performance.

3. There is no significant difference between large classes with student attitude on their academic performance.

5.4 Conclusion

On the basis of the data collected, analyzed and discussed, the following conclusion was arrived at:

a. Students' in small class size perform better than those in large class size.

b. Teachers in small class size reached out to all their students'

c. Students' in small class size show better attitude towards learning

d. Noise level are easily controlled in small class size

5.5 Recommendation

Based on the conclusion drawn from the findings of this study, the researchers recommend that:

1. In view of the effect of class size and attitude of in chemistry, it may be tried out in other subjects and levels.
2. Further study may be conducted to examine gender difference and locality difference in the use of different class sizes.

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APPENDIX A

INSTRUCTION: STUDENTS ATTITUDE TOWARDS CHEMISTRY

QUESTIONAIRE

Each of the statement express a feeling or attitude toward chemistry, you are indicate the extent of agreement by putting tick ( ) one column on the fine print scale on the right of each statement.

The fine prints are:

A – Agree, D – Disagree, SD – Strongly disagree, SA – Strongly agree and U – Undecided.

School _____

CLASS_____

Sex _____

		A			D	
1	Chemistry is fascinating and fun					
2	I really like chemistry					
3	I am always, under a terrible strum in a chemistry class					
4	I do not like chemistry and it scare me to have take it					
5	Chemistry is very interesting to					
6	I feel good when I					
7	My mind goes blank and I am unable to think clearly when working chemistry					
8	Chemistry makes me feels secure and at the same time is stimulating					
9	Chemistry is something that I enjoy greet deal					

10	Chemistry is a subject in school that I enjoyed studying					
11	I feel a sense of insecurity when attempting Chemistry					
12	Chemistry makes me feel uncomfortable and impatient					
13	Chemistry is boring					
14	Chemistry makes me feel as though I am in a jungle of formulas or equations and can't find my way					
15	I dislike chemistry					
16	I feel at ease in chemistry class					
17	I like chemistry than any other subject.					
18	Chemistry is better subject for to study than for girls					
19	I enjoy the teaching in a chemistry class					
20	I feel a definite positive reaction toward chemistry.					

APPENDIX B

TEACHERS QUESTIONAIRE

CLASS SIZE ON TEACHERS' TEACHING CHEMISTRY

INSTRUCTION:

This questionnaire is strictly for chemistry teachers. Small class sizes in expected to be students population between 10 – 25, medium class size between 25 – 40 students while large class size is from 40 and above, e students.

You are to indicate the extend of your agreement by putting a tick ( ) in one column on the five point scale on the right of each statement.

The fine prints are:

A – Agree, D – Disagree, SD – Strongly disagree, SA – Strongly agree and U – Undecided.

		A			D	
1	Students performance is better in chemistry in a large class size					
2	Student performance is better in chemistry in a medium class					
3	Student performances is better in chemistry in a small class size					
4	I chemistry class, students are well managed and controlled when the class is large					
5	Student are well managed and controlled in a chemistry class when the class size is medium					
6	Students are well managed and controlled in chemistry class when					
7	Students and teacher interaction are better in chemistry class when					
8	Students and teacher interaction are better in chemistry class when the class is a medium size					
9	Students and teachers interaction are better in					

	chemistry class when the class is a small size					
10	Students are better motivated to learn chemistry in a large class.					
11	Students are better motivated to learn chemistry in a small class					
12	In a chemistry class which consist of more female students performance is better.					
13	In a chemistry class which consist of more male students, performance is better.					
14	Students are better motivated to learn chemistry in a medium class					
15	Class size of students between 40 to 100 is better for rural area.					
16	Class size of students between 40 to 100 is better for urban area					
17	Class size of students between 20 to 40 is better for urban area					
18	Class size of students between 20 to 40 is better for rural areas					
19	Students understanding in chemistry are better when they are all males					
20	Students understanding in chemistry are better when they are all females.					

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