

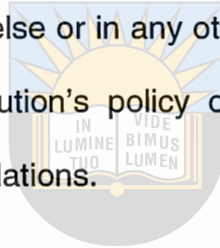
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FINAL DISSERTATION

Name and Initials	Rusi Lazola Nkosinathi
Student number	201316577
Name of department	Education
Title of dissertation	The relationship between class size and learner academic achievement in Grade 12 classes: a comparison between urban and rural schools in the King William's Town education district.
Name of Supervisor	Dr. V. Nkonki
Manner of obtaining degree	By full dissertation
Mode of study	Full time

Declaration

I, the undersigned, **Lazola Nkosinathi Rusi (201316577)** hereby proclaim that the study on "The Relationship between class size and learner academic achievement in Grade 12 classes. A comparison between Urban and Rural Schools in King Williams Town Education District" is my own original work and that any quotations used in the study have been accredited to their authors. This dissertation has not formerly been submitted for any degree or examination anywhere else or in any other university. I also hereby declare that I am entirely aware of the institution's policy on plagiarism, and I have taken every precaution to comply with the regulations.



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.....

Signature

01/04/2015

Date

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I wish to express my sincere appreciation to:

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Dedications

I dedicate this work to my late brother Putuma Rusi and my late father Jacob Mzoli Rusi; they both played a major role in my upbringing and were both very passionate about Education. May their souls rest in peace.



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Abstract

This project addresses the relationship of class size and learner academic achievement in Grade 12 classes. In addition, it makes a comparison of learner academic achievement between urban and rural schools in King Williams Town Education District. The research presents findings from a period of five years where class size and learner academic achievement was assessed from 2009 to 2013. The research focus is on the extent that learners from schools that maintained large and small classes differed in academic achievement. The primary goal of this research study was to determine if small classes resulted in improved student achievement compared to those students in larger classes. Moreover, the study sought to determine if the location where the school is located has an impact on the level of academic achievement of a learner. The results of the study indicated a negative relationship between class size and learner academic achievement. The effect of class size on learner academic achievement was weak as compared to the location of the schools. Location of the school was found to have a strong effect on the learners' academic achievement.

Key Words: Class size, learner, academic, achievement, schools, rural and urban.

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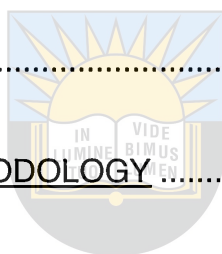
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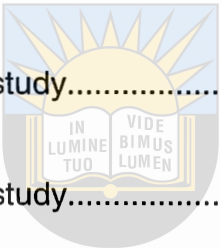
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List of acronyms

OECD.....	Organization for economic corporation development
DoE.....	Department of education
KWT.....	King Williams Town
STAR.....	Student Teacher Achievement Ratio
SES.....	Socioeconomic Status
CSR.....	Class Size Reduction
USA.....	United States of America



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CHAPTER 1

BACKGROUND AND INTRODUCTION OF STUDY

1.1 Background

In South Africa, there are many signs that show that there is a crisis in education. With high enrolment rates each year, and increasingly poor grade 12 output, it is clear that more concentration needs to be focused on the quality of education. It has been established that a number of factors or problems hinder learners from receiving a good standard of education (Statistics South Africa, 2011). The most pressing problems perceived by students concerned, in order of priority, are large class size, lack of books, high fees, large poor teaching and teacher absenteeism (Statistics South Africa, 2011). Among these factors, class size has been found as a factor contributing to poor performance in schools (Statistics South Africa, 2011). The Government's responsibility is to ensure that schools have adequate human resources to ensure sufficient delivery of basic education to all South African citizens. In South Africa, class size is often cited as a cause of poor learning outcomes (OECD, 2012). This research discusses class size and its association with poor academic performance, and some recommendations are made to improve this untenable situation. Comparisons are also between among rural and urban schools in King Williams Town.

There is a considerable increase in the enrollment of learners in South African schools due to the increased birth rates and migration rates where many foreigners are seeking refuge

in the country (World Bank, 2012). Data shows that since early 2000, there has been a considerable increase in the number of learners (DoE, 2000). National studies have found that the Eastern Cape, Limpopo and the rural areas of Kwazulu-Natal have the largest number of learners in their schools (Gordon, 1997). An analysis of the average number of learners by province indicates a significant increase in the number of learners enrolling at schools between 2001 and 2003 (Kanjee, Prinsloo, Khosa & Reddy, 2003). The province with the highest number of learners per school is Gauteng followed by Mpumalanga and KwaZulu-Natal. Free State and North West have fewer learners per school compared to Gauteng, Mpumalanga and KwaZulu-Natal. Recent enrollment rates indicate a considerable increase in enrollment in black schools as compared to white schools (Department of Basic Education, 2010). Enrollment has been increasing significantly in the country, and there are government initiatives to attract more teachers to cope with the increasing number of learners at schools by offering bursary programs for teaching studies such as *Funza Lushaka* (OECD, 2009). Furthermore, there has been a reported 102% increase in enrollment in primary schools in South Africa in the year 2011 (World Bank, 2012).

Increased enrollment rates in South African schools have resulted in increased students at schools, hence large class sizes. The Education Atlas of South Africa (Bot, Wilson & Dove, 2001) found out that the provinces with increased enrollment of learners in their schools such as Eastern Cape, Limpopo and KwaZulu-Natal have large classes. Large class size has not only been a factor affecting South Africa, but even in developed countries, it is

prevalent. Countries such as Brazil, China, Korea experience considerable increase in the population, and this has resulted in the increase in class size (OECD, 2009).

In OECD countries between the periods 2000 to 2009, the average class size was slightly increasing in secondary schools (OECD, 2009). Countries such as Japan, China, Israel and Korea were found to have large classes of over 50 learners per class, and this has significant impact in the quality of education delivered to such learners. Countries like Denmark, Estonia, Finland and the United Kingdom had considerable class sizes ranging from 20 learners to 35 learners per class.

In South Africa, in the period from 2001 to 2003, it was noted that among certain provinces in the country, some of the districts had large classes of 59 learners, and in extreme cases, some classes had 65 learners in a class (Kanjee *et al*, 2003). During this period, educators in different provinces were asked to indicate the number of their learners in their classes, and Limpopo was found to have educators indicating that they are responsible for 46 or more learners in one class (Makola, 2005). Mpumalanga and Eastern Cape Province followed Limpopo were the educators indicated they taught large classes of close to 46 learners per class.

In a statement by the Minister of Education in 2009 in response to Mr Smiles' questions, the Minister ranked Learner-Teacher Ratio among the different provinces in South Africa as: Eastern Cape having a Learner-Teacher-Ratio of 32, 5; Free State 46,7; Gauteng 46,7; KwaZulu Natal 37,8; Limpopo 44,3; Mpumalanga 44,5; Northern Cape 37,5; North West 38,6 and Western Cape 44,5 (Motsheka, 2009). Learner-teacher ratio implies the number

of learners a teacher is responsible for and can mean the same as class size. From the above ratios, it can be seen that class size is still an issue in South Africa since the goal of the ministry is to achieve an average class size of between 35 to 40 learners per class (Motsheka, 2009). Most class sizes in the provinces indicate class sizes of over 40 learners.

It is observed that rural based district schools tend to have larger class sizes than urban based district schools. Data analyzed across geographical locations to ascertain differences between schools in urban areas and rural schools indicated that most black teachers are responsible for teaching learners in classes of over 46 learners, followed by Coloureds and Asians who also teach considerably large classes of between 36-45 learners. This is followed by whites who are dominant in urban towns and was reported that they are responsible for classes with about 21 learners (Makola, 2005). The Department of Basic Education (2011a) reports an average class size of 30 in independent schools and 39 in public schools.

Considering learner academic achievement provincially in the period 2001 to 2003, most provinces characterized by small classes such as the Northern Cape and Western Cape indicated good learner academic matric results as compared to provinces with large class sizes such as Mpumalanga, Eastern Cape and North West (Makola, 2005). Assessing this learner achievement between urban and rural based schools, urban based schools were seen to be achieving higher pass rates as compared to rural based schools (Cohen, Raudenbush, & Ball, 2003).

This may, therefore, indicate a causal relationship between class size and learner academic achievement. As indicated by the discussion above, it can be seen that large classes can lead to poor quality of education delivered to learners as compared to smaller classes. Therefore, the proposed study sought to examine the relationship between class size and academic performance in South Africa with special reference to schools in King Williams Town education district.

1.2 Problem Statement



The matric pass rate for the Eastern Cape Province at large indicates that there is poor service delivery of education among learners in the Province. Furthermore, the quality of education is found to be substandard in rural and township schools, especially in King Williams Town (Statistics South Africa, 2011). The poor academic results indicate the Eastern Cape Province is crippled academically and is failing to provide better quality education to its citizens. One factor that might be contributing to such failure has been attributed to the increased class sizes the province is characterized with (Statistics South Africa, 2011). Large classes are perceived as contributing to poor academic achievement. Empirical data needs to be gathered so as to ascertain if any relationship exists between class size and academic performance. Only then will the perception about the relationship between large classes and poor academic performance be taken as real or unreal. In addition, the effect size and the practical significance of the relationship between class size and academic achievement in selected grade 12 schools in the KWT education district needs to be identified.

1.3 Research Questions

The study sought to answer the following research questions.

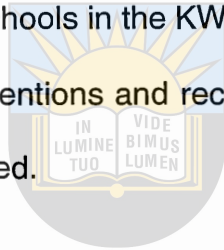
- Is there a significant relationship between class size and learner academic achievement in Grade 12 schools in the KWT education district?
- What is the effect size (strength) of the relationship between class size and learner academic performance in schools in the KWT district?.
- Is the effect size (strength) of the relationship between class size and learner academic performance significantly different between urban and rural settlement schools?
- Does the location of the school has an interaction effect on the association between class size and learners' academic performance in schools in the KWT education district?
- What is the practical significance of the relationship between class size and learners' academic achievement in schools in the KWT education district?

1.4 Objectives of the study

The study sought to achieve the following objectives:

- Explore the relationship that exists between class size and learner academic achievement;

- Determine if there are variations in the relationship between learner academic achievement and class size of learners from urban and rural schools;
- Determine the effect size of the relationship between class size and academic achievement in schools in the KWT education district;
- Determine the interaction/moderating effect of the geographic location of the school on the association between class size and academic performance;
- Determine the practical significance of the relationship between class size and academic achievement in schools in the KWT education district; and
- Recommend possible interventions and recommendations that can be proposed to address the problem identified.



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1.5 Hypotheses

Hypothesis 1

H_0 : Class size is not significantly related to learner's academic achievement.

H_1 : Class size is significantly related to learners' academic achievement.

Hypothesis 2

H_0 : The relationship between class size and learners' academic achievement has no practical significance.

H_1 : The relationship between class size and learners' academic achievement has practical significance.

Hypothesis 3

H₀: The correlations between class size on academic achievement of rural and urban schools do not differ significantly.

H₁: The correlations between class size on academic achievement of rural and urban schools differ significantly.

Hypothesis 4



H₀: The geographic location of the school has no moderating effect on the relationship between class size and learners' academic performance in schools in the KWT education district?

H₁: The geographic location of the school has a moderating effect on the relationship between class size and learners' academic performance in schools in the KWT education district?

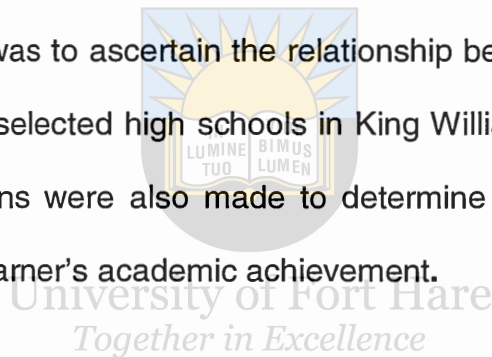
1.6 Justification

The student-teacher ratio for public schools tends to be high, and this contributes to students performing poorer as compared to private schools where there are few students per teacher, thus resulting in better learner performance. The high student- teacher ratio in black public schools has resulted in low and substandard performance from black schools

compared to white schools. There is congestion or overburdened enrollment in black public institutions, thus resulting in high pressure on scarce resources. This affects the level of effective resource distribution for improved results from students from public schools as compared to private institutions that are less congested and where distribution of resources is more effective.

1.7 Purpose of the study

The purpose of the study was to ascertain the relationship between class size and learner academic achievement in selected high schools in King Williams Town education District, Eastern Cape. Comparisons were also made to determine if the location of the school does have an impact on learner's academic achievement.



1.8 Significance of the study

There has been conflicting evidence on the effect of class size on learner academic achievement. Some researchers argue that class size has no effect on academic achievement while other researchers indicate that class size has significant effects on academic achievement. Other researchers argue that class size impacts on elementary schools more than at high schools. Rural settlement schools are seen as having large classes as compared to urban settlement schools. Therefore, the study was carried to explore the nature and the impact of the relationship between class size and academic performance especially in selected Grade 12 Schools in King Williams Town. By clarifying the nature and degree of relationship that exists between class size and learner

achievement, the study sought to indicate one important avenue to improve and enhance the quality of teaching and learning. Moreover, by clarifying the relationship, the study sought to improve learner academic achievement by making recommendations that promote the creation of the best environment to facilitate learning and engage students. The results of the study might also add to literature relating to class size and academic achievement in South Africa, and African countries since most of the studies relating to this topic have been conducted in developing European countries.

1.9 Definition of terms

1.9.1 Class Size



Class size is defined as the number of students regularly in a teacher's room and those to whom that teacher is responsible and accountable. It is the number of students assigned to a regular classroom teacher for instruction (Ehrenberg, Brewer, Gamoran, & Williams, 2001).

1.9.2 Large class size

Hayes (1997) claims that there is no quantitative definition of what constitutes a large class. This author therefore defines a large class as one with more students than the teacher prefers to manage and available resources can support; from this point of view, large classes are usually considered to pose insurmountable problems for teachers. Ur (1996) concludes: what is relevant to the class considered as a large class is how the teacher perceives the class size in the specific situation, regardless of the exact number of

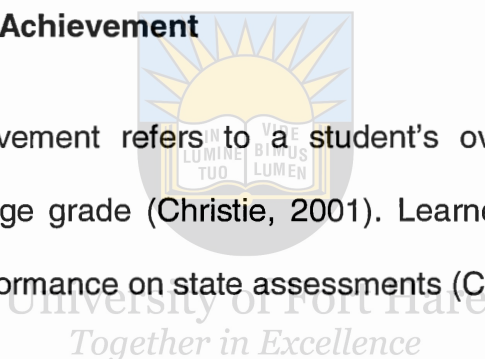
the students in it. Therefore, in this study, a large class is a class that comprises 40 or more learners.

1.9.3 Learner

Is a student who is taking courses in High School that leads towards University or College entrance (DoE, 2001)

1.9.4 Learner Academic Achievement

Learner academic achievement refers to a student's overall average in all subjects expressed as a percentage grade (Christie, 2001). Learner academic performance is a student's or learners' performance on state assessments (Cunnigham, 2003).



1.10 Outline of the research

Chapter 1: Introduction and Background of the study

This chapter provides the background of the study in relation to the problem that led to the research. This chapter includes the problem of the statement of the research problem, objectives and hypotheses, the significance of the study, theoretical framework and the definitions of key concepts

Chapter 2: Review of Related Literature

Chapter 2 provides a detailed literature review of the study variables as well the theoretical framework.

Chapter 3: Research Methodology and Design

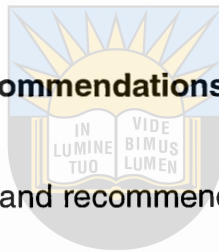
This chapter describes the research methodology applied in the study. The research methods, techniques and sampling procedures are discussed in this chapter.

Chapter 4: Data Analysis and Research Results

This chapter focuses on the analysis and interpretation of the research results using quantitative analysis.

Chapter 5: Conclusions and Recommendations

This chapter provides conclusions and recommendations for the future studies drawn from the research results. The limitations of the study are also provided in this chapter.



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CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The main purpose of this chapter is to present a review of literature related to the study. A review of literature is important to any research study as it acts as a channel of linking or relating the current study's thoughts and ideas to the current literature. Bailey (1997) maintains that reviewing available literature could help researchers in identifying gaps in studies by other researchers, so instead of tackling a new study, a researcher can decide to replicate the study. In this regard, this chapter explores literature comprising the theoretical framework underpinning the study as well as the empirical literature related to class size and learner academic achievement. The issue of class size and learner academic achievement is often complex, and there is no consensus on the effects of class size on academic achievement, by reviewing the above mentioned aspects, the intention is to provide perspective on the subject.

2.2 Theoretical framework

There are two theories underpinning this study. The two theoretical frameworks guiding this research are the attribution theory and the expectancy-value theory. The discussion of the two theories is presented below.

2.2.1 Attribution Theory

Weiner (1985) proposed a theory of motivation and emotion in which causal ascriptions play a key role. Weiner's model is particularly informative in research on student learning in school settings. In his model, Weiner outlined the processes through which learners form causal beliefs (Weiner, 2005). A basic assumption of Weiner's model of attributions is that learners are affected by both environmental factors (for example characteristics of the students' home or school) and by personal factors (for example prior experiences and prior knowledge). The basic premise of this theory is that people want to understand their environments and, therefore, strive to understand why certain events happen. In the classroom, the understanding students have about the causes of past events influences their ability to control what happens to them in the future. For example, if students fail a test, they will probably attribute that failure to a specific cause, usually an external factor they have no control over. When an achievement-related event occurs (for instance a student fails an examination), especially if the outcome was unexpected, Weiner (2000) proposes that learners undertake an attribution search in trying to understand what happened.

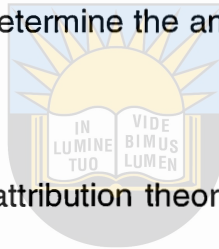
Attribution theory is probably the most influential contemporary theory with implications for academic motivation. It incorporates behaviour modification in the sense that it emphasizes the idea that learners are strongly motivated by the pleasant outcome of being able to feel good about themselves. Chingos (2011) argues that the theory incorporates cognitive theory and self-efficacy theory in the sense that it emphasizes that learners' current self-perceptions will strongly influence the ways in which they will interpret the

success or failure of their current efforts and hence their future tendency to perform these same behaviours. Chingos & Peterson (2011) further maintains that according to attribution theory, the explanations that people tend to make to explain success or failure can be analyzed in terms of three sets of characteristics:

- First, the cause of the success or failure may be internal or external. That is, we may succeed or fail because of factors that we believe have their origin within us or because of factors that originate in our environment;
- Second, the cause of the success or failure may be either stable or unstable. If we believe cause is stable, then the outcome is likely to be the same if we perform the same behaviour on another occasion. If it is unstable, the outcome is likely to be different on another occasion; and
- Third, the cause of the success or failure may be either controllable or uncontrollable. A controllable factor is one which we believe we ourselves can alter if we wish to do so. An uncontrollable factor is one that we do not believe we can easily alter.

The attribution theory is a motivational theory looking at how the learners in schools construct the meaning of an event based on their motives to find a cause and their knowledge of the environment. The theory basically looks at how people make sense of their world and what cause and effect inferences they make about the behaviours of others and of themselves. The purpose behind making attributions is to achieve cognitive

control over one's environment by explaining and understanding the causes behind behaviours and environmental occurrences. Making attributions gives order and predictability to our lives and helps us to cope. Sims (2008) states that when learners make attributions, they analyze the situation by making inferences (going beyond the information given) about the dispositions of others and themselves as well as inferences about the environment and how it may be causing a person to behave. The basic principle of attribution theory, as it applies to motivation, is that a person's own perceptions or attributions for success or failure determine the amount of effort the person will expend on that activity in the future.



There are four factors related to attribution theory that influence motivation in education: ability, task difficulty, effort, and luck. Sims (2008) argues that in terms of the characteristics discussed previously, these four factors can be analyzed in the following way:

- **Ability** - it is a relatively internal and stable factor over which the learner does not exercise much direct control;
- **Task difficulty**- it is an external and stable factor that is largely beyond the learner's control;
- **Effort** - it is an internal and unstable factor over which the learner can exercise a great deal of control; and

- **Luck** - it is an external and unstable factor over which the learner exercises very little control.

Hoxby (2000) notes that the learner's perception determines how attributions will influence future effort. A learner may believe that he or she is a lucky person and for him or her luck, would be an internal and stable characteristic over which he exercises little control. In other words, for this person, luck is really what the preceding list calls an ability or personality characteristic. Likewise, a person may believe that he or she expended a great deal of effort when in fact, he or she did not, or that an objectively easy task was difficult. The basic principle of attribution theory, as it applies to motivation, is that a person's own perceptions or attributions for success or failure determine the amount of effort the person will expend on that activity in the future (Hoxby, 2000).

According to attribution theory, the explanations that people tend to make to explain learner's success or failure can be analyzed in terms of a set of characteristics. The first characteristic is that the cause of the success or failure may be internal or external (Weiner, 2000). That is, we may succeed or fail because of factors that we believe have their origin within us or because of factors that originate in our environment. The second characteristic is that the cause of the success or failure may be either controllable or uncontrollable (Weiner, 2000). A controllable factor is one which students believe themselves they can alter if they wish to do so. An uncontrollable factor is one that students believe they can easily alter. In the proposed study, students' achievement is attributed to external factors such a class size. Students have no control

over these external factors, for example class size. In the proposed study, learners from a large class may attribute their failure to the fact that they come from a large class.

2.2.2 Expectancy-Value theory

One long-standing perspective on motivation is Vroom's Expectancy-Value Theory (1964). Theorists in this tradition argue that individuals' choice, persistence, and performance can be explained by their beliefs about how well they will do on the activity and the extent to which they value the activity. Expectancies and values are assumed to influence performance, effort and persistence. Expectancies and values are assumed to be influenced by task-specific beliefs such as ability beliefs. In his attribution theory, Weiner (1985) proposed that individuals viewed ability as a relatively stable characteristic over which they had little control. This author argued that attributions made to ability and lack of ability has important motivational consequences.

Attributing success to ability has positive motivational consequences, whereas attributing failure to lack of ability has negative consequences. If a learner believes that he or she is able to do a task, he or she will succeed in that task. Additionally, if a learner values the task to be important, he or she will succeed in the task as compared to a person who attaches no significant value to a task. Such a learner is going to put more effort so as to achieve the intended goals. Learners with the need for achievement as in McClelland's motivational theory (1976) will succeed regardless of the external factors available. It is obvious that learners who are not motivated to succeed will not work hard. In relation to the proposed study, regardless of the location of the school and the class size factor, if

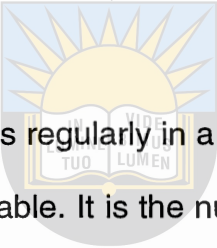
learners value their education and believe that they can do better in their studies, they will be successful.

In the academic field, the expectancy value theory was originally developed to explain gender differences in mathematics engagement and achievement in school children (Eccles et al., 1983). Subsequently, it has been used to explain how expectancies and values directly and indirectly influence achievement choices, performance, effort, and persistence across a wide range of academic and physical domains and age groups (Wigfield and Cambria, 2010; Wigfield and Eccles, 2000). In this model, expectancies for success and subjective task values are reciprocally related to each other and are directly related to achievement-related choices and performance. Expectancies focus on future success and, as such, are distinct from, although related to, ability beliefs, which focus on present ability (Wigfield and Eccles, 2002). Subjective task values refer to the quality of the task that contributes to the increasing or decreasing probability that an individual will select it (Eccles, 2005). Tasks that are perceived as valuable are more likely to be associated with a wide range of motivational outcomes, including better achievement (Shechter, Durik, Miyamoto, and Harackiewicz, 2011).

Subjective task values have several components (Wigfield, 1994). Interest or intrinsic value refers to the enjoyment one gains from engaging in the task. Attainment value refers to the importance placed on doing well at that task. Utility value refers to how useful the task is to a person's future (for example undertaking a statistics course in order to become a psychologist). Finally, relative cost, which has been least studied (Wigfield and

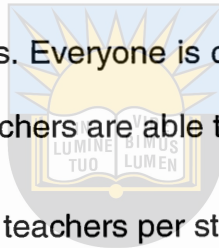
Cambria), refers to assessments of how much effort is needed to accomplish the task and the cost of that in terms of other activities (for example losing time to socialize). Expectancies and values are influenced by the individual's goals and general self-schema (short- and long-term goals, self-concept and ability beliefs, and perceptions of task difficulty). Values are also influenced by the individual's affective reactions. More significantly, past performance and aptitude, as well as the socialiser's expectations and behaviours, influence these goals, self-schema, and affective reactions.

2.3 Class size



Class size is the number of students regularly in a teacher's room and those to whom that teacher is responsible and accountable. It is the number of students assigned to a regular classroom teacher for instruction (Ehrenberg, Brewer, Gamoran, & Williams, 2001). Several academics have sought to define class size and explain its benefits. Class size is a statistical measure which measures the number of pupils taught in a class during a single selected period of a particular school day (Hawkins and Lilly, 2008). In other words, class size, refers to the average class size in a given grade level of a given school. Class size is incorrectly understood as student-teacher ratio, but these two terms are different from each other. "Student-teacher ratios, normally, are calculated by taking the total number of teachers at a given school divided by the complete enrolment of that school. This distinction is significant, because the ratio will not always match up with the class size figure (or vice-versa)" (Harris, 2009). For example, a student-teacher ratio may be small, but a class size may be larger than what the student-teacher ratio leads one to believe.

Literature by Hayes (1997) claims that there is no quantitative definition of what constitutes a large class. This author, therefore, defines a large class as one with more students than the teacher prefers to manage and available resources can support, from this point of view; large classes usually are considered to pose insurmountable problems for teachers. It is for this reason that Rockoff (2009) views that the size of the class is largely under control of the school system, and its choice influences the size and number of classrooms and the number of teachers required, and so class size is naturally a concern of parents, teachers, and school administrators. Everyone is concerned that the pupils should receive adequate attention and that the teachers are able to control their classes.

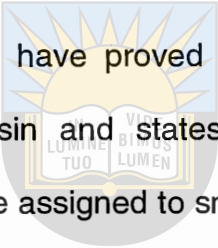


Some courses seem to need more teachers per student than others. For example, classes in carpentry or cooking, in which hazardous tools and equipment are used, may require closer supervision than a class in arithmetic. Class size is a highly controversial issue, which today has sunk into the background of the education debate somewhat. Common sense and extensive research suggest that the smaller the class a child is in, the more individual attention he or she can receive, which will presumably improve educational attainment. Class size has been a significant issue for many years, with concerns long expressed about the quality of teaching possible when a single teacher is responsible for large numbers of pupils. Dwindling teacher retention and low schools funding had, by the mid-1990s, led class sizes, particularly in primary schools, to be regarded as something of a crisis (Tanner, 2009).

Class size has been an area of concern particularly in the developed education fraternities. Banghart (2000) held that there are a “small number of variables in American K-12 education that are both thought to influence student learning and are subject to legislative action. Class size is one”. Class size is one of the small numbers of variables in American K-12 education that are both thought to influence student learning and are subject to legislative action. Legislative mandates on maximum class size have been very popular at the state level. Tanner (2009) notes that in recent decades, at least 24 states have mandated or incentivized class-size reduction (CSR). The current fiscal environment has forced states and districts to rethink their CSR policies given the high cost of maintaining small classes. For example, increasing the pupil-teacher ratio in the U.S. by one student would save at least \$12 billion per year in teacher salary costs alone, which is roughly equivalent to the outlays of Title I of the Elementary and Secondary Education Act, the federal government’s largest single K-12 education program (Tanner, 2009). These substantial expenditures that are needed to sustain smaller classes are justified by the belief that smaller classes increase student learning. This shows that in the developed world, class size is seen as one of the important determinants of successful learning.

Literature on class size has been largely mixed; there is no settled opinion on the likely effects of class size in learning. However, a “large body of research suggests that class size has only small effects on educational outcomes. The vast majority of these studies simply examine the association between variation in class size and student achievement” (Tanner and Lackney, 2006). The primary difficulty in interpreting this research is that schools with different class sizes likely differ in many other, difficult-to-observe ways. For

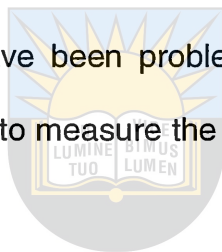
example, more affluent schools are more likely to have the resources needed to provide smaller classes, which would create the illusion that smaller classes are better when in fact family characteristics were the real reason. Alternatively, a school that serves many students with behaviour problems may find it easier to manage these students in smaller classes. A comparison of such schools to other schools might give the appearance that small classes produce less learning when in fact, the behaviour problems were the main factor.



Studies from the developed world have proved that class size matters. For instance, studies from Tennessee, Wisconsin and states throughout the United States have demonstrated that students who are assigned to smaller classes in grades K-3rd do better in every way that can be measured: they score higher on tests, receive better grades, and exhibit improved attendance. The most influential and credible study of class size reduction is the Student Teacher Achievement Ratio, or STAR, study which was conducted in Tennessee during the late 1980s. Beginning with the entering kindergarteners in 1985, students and teachers were randomly assigned to a small class, with an average of 15 students, or a regular class, with an average of 22 students. Thus, the reduction in class size (7 students, or 32 percent) was quite large. There are several research studies based on the STAR experiment. Below is a discussion of two, including one that focuses on longer-term outcomes.

Literature by Krueger's (1999) made an analysis of the Tennessee STAR experiment and found that elementary school students randomly assigned to small classes outperformed

their classmates who were assigned to regular classes by about 0.22 standard deviations after four years. This was equivalent to students in the smaller classes having received about 3 months more schooling than the students in the regular classes. This effect was concentrated in the first year that students participated in the program. In addition, the positive effects of class size were largest for black students, economically disadvantaged students and boys. Krueger (1999) estimated that the economic returns to class-size reduction in Tennessee were greater than the costs, with an internal positive rate of return of about 6 %. However, there have been problems with the methodologies that these studies used. Methodologies used to measure the outcomes of class size have been seen to have bias.



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Angrist and Lavy (1999) highlight a particular way in which such bias can arise. This points to the fact that class size is often positively related to enrolment, which may, in turn, be correlated with socioeconomic status (SES) and achievement. These channels seem to be empirically relevant. Various studies have sought to come up with robust models that eliminate bias and other statistical errors. Lazear (2001) presents a model in which a causal negative effect of class size on achievement is obscured as schools assign more disruptive students to smaller classes. More generally, if class size is endogenously determined, cross-sectional variation may yield biased estimates of its effects.

Most of these studies that were conducted in the US used statistical and economic estimation techniques to measure the effects of class size. For instance, Rivkin, Hanushek, and Kain (2005) used a sophisticated statistical model to examine the effects of

natural variation in class size in Texas in the mid-1990s. The study utilized longitudinal data from more than one-half million students in over three thousand schools. The researchers found positive effects of smaller class sizes on reading and mathematics in 4th grade, a smaller but still statistically significant effect in 5th grade, and little or no effects in later grades. Because the researchers used state assessment results that were only available beginning at 4th grade, they could not estimate class-size effects for the early grades that were studied in STAR. The estimated class-size effects for 4th and 5th graders in Texas were about half the size the K-3 effects in Tennessee.

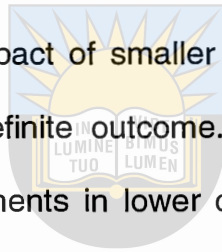
International studies, other than those from the US, also provide positive evidence for the effects of class-size reduction. Angrist and Lavy (2000) took advantage of a class-size limit in Israel of 40 students. Whenever there were more students in a grade than 40 per teacher, a teacher and classroom had to be added. The effect on class size in smaller schools proved to be dramatic. For example, with 80 students in a two-classroom 3rd grade, class size would be 40, but with 81 students it would be 27. The researchers found positive effects of smaller fourth- and fifth-grade classes. The main outcomes of class size were found in class size reduction. This strategy has been popular in the developing world. Class size reduction can affect the achievement gap in three ways.

- (i) First, if high achievers benefit more than low achievers from being in small classes, then one would expect more variability in student achievement in small classes than in regular classes (Konstantopoulos, 2006). In this case the achievement distribution in small classes will have a higher mean and a larger standard deviation than the achievement distribution in regular classes. This

may also indicate that achievement differences between students in small and in regular classes are larger in the upper tail of the achievement distribution (higher-achieving students) than in the lower tail (lower achieving students). If this hypothesis were true, then small classes would not close the achievement gap between the two groups of students;

- (ii) Second, "if low achievers benefit more from being in small classes, then one would expect smaller variability in achievement in small classes than in regular classes. In this case, the achievement distribution in small classes will have a higher mean and a smaller standard deviation than the achievement distribution in regular classes" (Konstantopoulos, 2006). This may also indicate that achievement differences between students in small and regular classes are larger at the lower end of the achievement distribution (lower achieving students) than at the upper end (higher-achieving students). If this hypothesis were true, then small classes would close the achievement gap between low and high achievers because low achievers would benefit more than other students from being in smaller classes; and
- (iii) Third, if small and regular classes help higher- and lower-achieving students similarly, then one would expect the variability in achievement in small and regular classes to be comparable. In this case, the achievement distribution in small classes will have a higher mean than that in regular classes but a comparable standard deviation (Konstantopoulos, 2006).

The effects of class size on children's learning have been studied, usually without reaching definitive conclusions. Most research on class size has compared the performance of pupils in classes of different sizes in such cognitive subjects as reading, mathematics, or social studies. Designing and executing these studies is difficult not only because parents may object to variation in the treatment of children, but also because of the constraints that must be imposed if anything of value is to be learned from the investigation (Rockoff, 2009). Groups are to be compared following different treatments need to be equivalent at the start. The debate over the impact of smaller class sizes continues to this day, with conflicting conclusions and no definite outcome. However, evidence suggests that, in terms of value for money, investments in lower class sizes do not provide the greatest possible benefit.



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2.4 Learner Achievement

Learning achievement is knowledge mastery or skill that is developed by subject, and it is shown by the mark (grade) that is given by a teacher (Purwodarminto in Nurkholis 2006:10). Learning achievement or learning result is the change that occurs in the student's self, following a learning process. Learning result is a response that given by students. One of the parameters used to measure the level of educational success is students' learning achievement. Learners' achievement relates to all aspects of their planned learning. It includes their achievement in relation to national standards and expectations in the broad and general education (Anthares, 2013).

If the students show good learning achievement, it means that the education process is success. However, when students show bad learning achievement, it means that the education process has failed. When there are low rates of student achievements, policy makers and researchers become increasingly concerned with low education quality in the era of increased education spending. It has been realized that poor education outcomes can have detrimental effects on a country's economic and social development. At the individual level, low learning achievement not only limits one's progression further in school, but it also negatively affects an individual's future income and productivity (Hanushek and Pace, 1995). Nevertheless, the recognition of the problem of poor learning outcomes has not translated into the development of more effective actions to improve education quality. Therefore, considering the important role of students learning achievement to determine the success of education, the learning process should be directed toward the increasing of students learning achievement. However, it is worthwhile to know the kind of factors those influences it.

Anthares (2013) notes that research has shown that the variation in student achievement is predominantly a product of individual and family background characteristics. Of the school factors that have been isolated for study, teachers are probably the most important determinants of how students will perform on standardized tests. Given the past failures of education reform to make significant improvements in student performance, it is reasonable to focus on those factors that research has shown have the greatest influence on achievement. A study by Coleman (1966) found that background characteristics such

as race, parental achievement levels, and family income swamped most other factors studied as determinants of student test scores. Decades of research have confirmed this study's general findings, with a 1999 paper estimating that 60 percent of variation in student achievement was attributable to such background characteristics.

An ample knowledge-base tells us that teachers account for a substantial share of the influence on student's performance, and currently, a growing body of evidence points to school leadership playing a powerful role in the success of students. Many factors contribute to a student's academic performance, including individual characteristics, family and neighbourhood experiences. However, research suggests that among school-related factors, teachers matter most. When it comes to student performance on reading and maths tests, a teacher is estimated to have two to three times the impact of any other school factor, including services, facilities and even leadership. Research by Marzano, Waters, and McNulty (2005) suggests that the roles of principals and superintendents are notable enough to make it imperative that educators seek ways of advancing leadership skills as part of school improvement and reform efforts. In addition to this, recent evidence suggests that a teacher's impact on student achievement remains reasonably consistent even if the teacher changes schools, regardless of whether the new school is more or less advantaged than the old one.

Other school facilities have also been seen to influence student participation. Literature has shown that school quality and other school facilities are central to student participation. For example, literature by Abramson (1991) found higher achievement in schools with adequate space and further noted that if those larger spaces were used for

instructional purposes, the achievement was even greater. The lesson is clear. Students need ample space because crowding causes problems. For example, a high-density school influences achievement negatively. The effects of high density were summarized by Wohlwill and van Vliet (1985) thus, "It appears as though the consequences of high density conditions that involve either too many children or too little space are: excess levels of stimulation; stress and arousal and a drain on resources available.

In South Africa, studies have shown that socio-economic status seems to lay a huge role in influencing student achievement. Studies have proved that socio-economic education which is the class influences overall learner performances especially in provinces that are relatively rich like the Western Cape, Northern Cape and Gauteng which obtained higher overall matric pass rates than the poorer provinces (DoE, 2006). In addition to this, literature in South Africa has seen that poor provinces tend to perform poorly as compared to rich provinces. Differences were also noted within provinces where urban schools achieved good matric passes compared to poorer matric results from rural schools. The rural schools in Eastern Cape, KwaZulu-Natal and Mpumalanga obtained poor matric results as compared to the urban schools in these provinces. Therefore, other factors socio-economic status factors such as class play a significant role in learner's academic achievement (DoE, 2006).

It can thus be concluded that learner achievement is a complex factor which requires careful consideration because there are various factors that influences it. These factors depend on the prevailing circumstances.

2.5 Relationship between class size and learner achievement

The impact of class size on student achievement remains an area of concern for educational decision makers. Policy makers are perpetually looking for ways to raise educational quality, and often turn to academics for guidance on how this might be done. Perhaps surprisingly, however, empirical research sheds little light on how to best allocate educational budgets. Gilman and Kiger (2003) stated “the current focus on reducing class size has become a controversial topic in the education world, and contradictory findings from various research studies have yielded speculation about whether smaller classes actually improve student achievement. Because education plays an important role in shaping an individual’s life opportunities, it is generally agreed that the higher a person’s achieved educational status, the higher the returns for that person in terms of economic and social status (see, for example, Levin 2001). However, what is less clear are which factors shape educational attainment, and how they operate. Teasing out these factors and their effects is extremely complex. In order to explain differences in educational attainment, one needs to consider a number of factors frequently considered important at various levels of education systems. Class size is one of those factors.

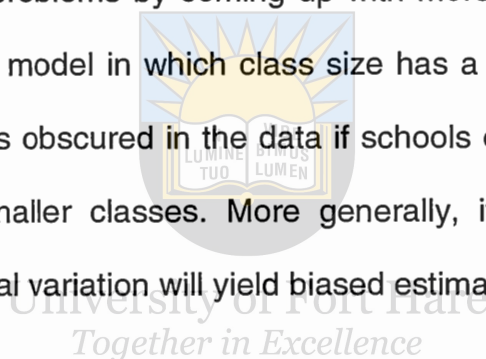
Due to popular belief that class size matters, there is a great deal of interest in and enthusiasm for class size reduction (CSR) and many states are in the process of implementing CSR as a part of their educational policy. Class size reduction has been promoted as an educational panacea. Does the research support the hope that smaller class sizes will improve learning? While empirical evidence on the relationship between CSR and achievement is mixed, many studies indicate that reduced class sizes leads to

improved student achievement (Finn and Voekl, 1992; Robinson, 1990). Class size reduction appears to be more effective for minority, low-achieving and low SES students (Angrist and Lavy, 1997).

The key empirical challenge in identifying class size effects arises due to the potential non-random matching of students to schools and, within schools, to particular classes. For instance, if higher ability students are systematically placed in the larger classes within their grade in the school, a positive coefficient for class size can appear in a standard estimate of the education production function but this would not represent a causal effect. In order to circumvent this kind of endogeneity bias two major approaches have been used in the literature. The first uses randomized experiments. The Project STAR (Student/Teacher Achievement Ratio) carried out in Tennessee in the mid-1980s is probably the most important study of this kind. Krueger (1999) found that the advantage of experimentally reducing class size were relatively small: a reduction of around 8 students per class raised test score by less than 0.02 standard-deviations, making class size reduction a very costly way of achieving small learning gains.

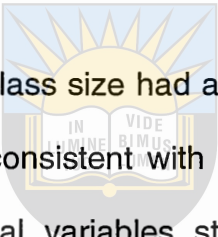
A number of studies that used quantitative or statistical techniques suffered from endogeneity or biases errors. Several studies have sought to include instrumental variables or other robustness techniques to remove the statistical errors. Angrist and Lavy (1999) highlight a particular way in which bias can arise. Namely, class size is often positively related to enrollment, which may in turn be correlated with socioeconomic status

(henceforth SES) and achievement. The combination can cause cross sectional data to suggest that larger classes do not lower, and may even raise, test scores. Further, this situation seems to be empirically relevant: Lavy (1995) finds an enrollment/SES/achievement link to be an important feature in Israel, and points out that the Coleman (1966) report produced a similar finding for the U.S. In an effort to investigate the link between class size and learner achievement, various studies also sought to address these statistical problems by coming up with more strong models. For instance, Lazear (2001) presents a model in which class size has a negative and causal effect on achievement, one which is obscured in the data if schools optimally assign weaker, more disruptive students to smaller classes. More generally, if class size is endogenously determined, cross sectional variation will yield biased estimates of its effects.



Angrist and Lavy's (1999), the first research design exploits a teacher allocation practice that allows principals whose schools have classes with more than 30 students to apply for an additional teacher. This mechanism generates a discontinuity in the enrolment/class size relation, making it feasible to identify the latter's effect using the resulting class size function as an instrumental variable. In short, this strategy accepts the presence of an enrolment/SES link, but identifies a situation where the effects of class size can be potentially separated from those of enrolment. The second strategy focuses on variation in class size that arises from comparisons of rural schools that have fewer than 30 students, and hence only one classroom per grade. First, this eliminates their ability to allocate weaker students to smaller classes in the manner raised by Lazear (2001). Second, these

schools are likely to be in remote areas and enjoy a monopoly in educational supply, reducing the scope for parental choice. This may account for why, at least on observables, enrolment/SES correlations are weaker among these schools than in broader samples. In contrast with the first approach, therefore, this strategy focused on a situation where it is impossible to isolate class size from enrolment because they are in fact equal. Instead, it partially relied on the assumption that in comparisons between remote areas, enrolment/SES correlations may be less important.



Both research designs suggested class size had a negative and significant impact on test scores. Further, the results were consistent with non-linearities in this effect: they were relatively large for the instrumental variables strategy, which emphasizes substantial variations in class size from high initial levels. They were also smaller for the second design, which emphasized schools with rather smaller classes. From a policy perspective, they suggested that in rural Bolivia, limiting class size among lower grades may have a significant return.

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It can thus be seen that evidence from both developing and developed countries, particularly the United States, is mixed. Literature by Hanushek (2003) based partially on extensive review of the USA literature concludes that school inputs such as teacher salaries and classroom size do not matter for student test score performance. Hanushek (2003) argues that increased school expenditures do not provide the requisite incentives within schools to improve learning outcomes. Rather, it is mainly family background in

terms parental income and education that are most importantly determinants of student performance.

On the contrary, Card and Krueger (1996) and Krueger (2003), using different measures of education outcomes, in particular post graduation earnings and controlling for omitted variables such as student ability, found that lower class sizes have strong and positive effects on future earnings. Differences in the results on class size are attributed to different treatment of omitted variables such as student ability and family background, which can lead to a spurious relation between school inputs and student performance. Other studies focusing on developing countries also point to school infrastructure to be an important factor for improved learning outcomes. For example, Glewwe and Jacoby (1994) using a survey of 1600 households in Ghana that tested students on mathematics, reading, and abstract reasoning investigate what kind of resources are important determinants of learning achievement and school completion. They found that providing blackboards and repairing school roofs that leak increases learning per year.

Studies that used high-quality experimental data have consistently demonstrated the positive effects of small classes on average student achievement for all students (Krueger, 1999; Nye, Hedges and Konstantopoulos, 2000). Specifically, these studies indicated that the average student achievement in small classes (15 students on average) was significantly higher than in regular classes (22 students on average). These findings suggest that reducing class size is a promising intervention that increases academic

achievement on average for all students. Given that previous findings on the social distribution of the effects of small classes have been mixed and inconclusive, Konstantopoulos (2005) attempted to shed light on the mechanism through which small classes affect the achievement of low- and high-achieving students. Konstantopoulos (2005) used data from a 4-year large-scale randomized experiment (project STAR) to examine the effects of small classes on the achievement gap. The sample consisted of nearly 11,000 elementary school students who participated in the experiment from kindergarten to grade 3. Meta-analysis and quintile regression methods were employed to examine the effects of small classes on the achievement gap in mathematics and reading (Stanford Achievement Test). The results consistently indicated that higher-achieving students benefited more from being in small classes in early grades than other students. The findings also indicated that although all types of students benefited from being in small classes, reductions in class size did not reduce the achievement gap between low and high achievers.

In another study, Woessman and West (2006), taking advantage of differences in average class size between the 7th and 8th grades within schools, examined class-size effects on performance on international examinations in 11 countries around the world. They found educationally meaningful effects of smaller classes in a small number of countries, and a roughly even split between no effects and small effects in the remainder of the countries. Interestingly, the countries in which they found educationally meaningful positive effects of smaller classes are those with low salary levels for teachers and lower than average

performance on international exams. A low average salary level for teachers suggests that a country is drawing its teaching population from a relatively low level of the overall capability distribution of all its employees. Thus, the countries studied by Woessman and West seemed to have taken different paths, with some opting for relatively large numbers of poorly-paid teachers who performed better in smaller classes and others having relatively fewer but better-paid teachers whose performance was not as affected by the number of students in class. In this regard, it is worth noting that the East Asian nations that perform at higher levels than the U.S. on international exams have very large class sizes.



In South Africa, empirical evidence suggests that socio-economic status influences overall learner performances, especially in provinces that are relatively rich like the Western Cape, Northern Cape and Gauteng which obtained higher overall matric pass rates than the poorer provinces (DoE, 2006). Mpumalanga, Eastern Cape and KwaZulu-Natal provinces had low matric pass rates (DoE, 2006). Differences were also noted within provinces where urban schools achieved good matric passes compared to poorer matric results from rural schools. The rural schools in Eastern Cape, KwaZulu-Natal and Mpumalanga obtained poor matric results as compared to the urban schools in these provinces. Thus considering all other factors, socio-economic status factors such as class do plays a significant role in learner's academic achievement (DoE, 2006)

2.6 Chapter Summary

The main focus of this chapter was to present the theoretical framework and the empirical literature that underpins this study. In an attempt to do this, the study conducted a literature survey. The study presented two theories that underpin this study, and these are the attribution theory and the expectancy-value theory. With the attribution theory, it was revealed that in this study, students achievement is attributed to external factors such as class size. Students have no control over these external factors for example class size. In the proposed study, learners from a large class will attribute their failure to the fact that they come from a large class. In the academic field, the expectancy value theory could be subsequently used in this study to explain how expectancies and values directly and indirectly influence achievement choices, performance, effort, and persistence across a wide range of academic and physical domains and age groups.

Empirical literature was consulted, and it was seen that despite there being a large literature on how class-size affects academic achievement, only a few studies are of high enough quality and sufficiently relevant to be given credence as a basis for legislative action. Conflicting results have been found with regards to the relationship that exists between class size and learner academic achievement. Some researchers argue that there is a positive relationship between class size and learner academic achievement while others argue that class size has no effect on learner academic achievement.

Because the pool of credible studies is small, the individual studies differ in the setting, method, grades, and magnitude of class size variation that is studied; and no study is without issues, including those reviewed here, therefore conclusions have to be tentative. Thus, it can be said that empirical evidence of the benefit of smaller class sizes on education outcomes presents a more complicated picture. Questions such as: what size class is 'small enough?' how and why reducing class size works?and under what conditions it works? are all under-explained. It is therefore safe to say that there still exists a gap in literature on the relationship between class size and learner achievement.



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CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The previous chapter presents the literature review concerning the phenomenon under study. The present chapter provides the methodology employed in this study. Research methodology is a body of methods adopted in a particular research study or activity (Hair, Wolfinbarger, Ortinau & Bush, 2008). Research methodology is concerned with how data is collected, measured and analyzed in an attempt to achieve research objectives (Kothari, 2004). This chapter addresses how data was collected, measured and analyzed through discussion of various sections of the research methodology, namely, the research design, population of the study, sample and sampling methods and the research instruments.

3.2 Research aim and Question

As previously mentioned in chapter one, the main aim of the study is to explore if there is a correlation between class size and learner academic achievement in Grade 12 schools in the KWT education district. Additionally, a comparison was done between urban high schools and rural high schools. In an attempt to achieve the above- mentioned aims, the following research questions were asked:

3.2.1 Is there a significant relationship between class size and learner academic achievement in Grade 12 schools in the KWT education district?

3.2.2 What is the effect size of the relationship between class size and learner academic performance in schools in the KWT district?

3.2.3 Is the effect size of the relationship between class size and learner academic performance significantly different between urban and rural settlement schools?

3.2.4 Does the location of the school has an interaction effect on the association between class size and learners' academic performance in schools in the KWT education district?

3.2.5 What is the practical significance of the relationship between class size and learners' academic achievement in schools in the KWT education district?

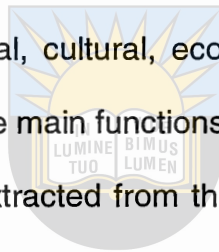


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3.3 Research paradigm

Research paradigm is the underlying assumptions and intellectual structure upon which research and development in a field of inquiry is based (Neuman, 2006). According to Parahoo (2006), a research paradigm is a worldview from a general point or a way of breaking down the complexities of the real world to make concepts simpler. Furthermore, Wellington (2008) strongly agrees that a research paradigm is a basic set of beliefs that guides action, specifically in terms of disciplined inquiry, in a wider sense, thereby making concepts on how a particular phenomenon should be studied and understood. Among others, there exists positivist, interpretive and critical paradigms that are mainly used in research.

The positivist paradigm is made up of distinct concepts that produce constructive results, that is, it involves experiments and testing in order to gather data (Wellington, 2008). The interpretive research paradigm seeks understanding and places emphasis on the human capacity as it seeks to understand others through sympathetic introspection and reflection based on detailed narrative gathered through direct observation, in-depth, open-ended interviewing, and case studies (Cooper & Schindler, 2003). Last but not least, the critical paradigm focuses on oppression whereby it aims to promote democracy by making changes in different social, political, cultural, economic, ethical as well as other society oriented beliefs and systems. The main functions of a paradigm is that it defines how the world works, how knowledge is extracted from this world, and how one is to think, write, and talk about this knowledge (Neuman, 2006).



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In this respect, the study was based upon the positivist research paradigm and was aimed at interpreting the relationship between class size and learner achievement through principles, belief and knowledge that can be directly experienced and verified. This is so as a lot of data was gathered through learner-records and/or documents which included mark schedules, class registers and school reports, amongst others. The positivist paradigm involves principles, belief and knowledge that can be directly experienced and verified between independent observers (Wellington, 2008). Logical positivism, as it is known in some literature, is a scientific paradigm based on empirical testing using inductive and deductive hypotheses which are applied in order to interpret data (Neuman, 2006). Thus, positivist paradigm enabled the researcher to deal with complex social problems such as class size and learner achievement and was concerned with their visible manifestations

rather than the underlying casual mechanisms that are invisible. Hence, positivist paradigm tends to treat the symptoms rather than the root cause of the problem.

3.4 Research Approach

Basically, there are various approaches that can be used in research. Researchers can adopt a qualitative research approach or a quantitative research approach. There is an important distinction between quantitative research and qualitative research. In qualitative research, the information obtained from participants is not expressed in numerical form. The emphasis is on the stated experiences of the participants and on the stated meanings that they attach to themselves, to other people, and to their environment (Patton, 2002). Those carrying out qualitative research sometimes make use of direct quotations from their participants, arguing that such quotations are often very revealing (Eysenck, 2004). In quantitative research, the information obtained from the participants is expressed in numerical form. Quantitative research employs mathematical analysis for the measurement of variables and places a heavy emphasis on the use of structured questionnaires (Cant, Gerber, Nel, & Kotze, 2005). According to Hair *et al.* (2008), quantitative research enables the researcher to validate relationships and to test hypotheses.

As far as a research approach is concerned, when conducting research, the research can be either qualitative, quantitative or a combination of both (Patton, 2002). For the purpose of this research, a quantitative approach was chosen. A quantitative approach was found to be appropriate since the research purpose is to test predictive and or cause-effect type

of hypotheses (Tashakkori & Teddlie, 2003). The study sought to analyze the relationship between the study variables. Thus, the quantitative approach was considered to be more suitable for this study. The quantitative approach was chosen because its set of questions is limited, thereby, facilitating comparison and statistical aggregation of the data (Patton, 2002). This allowed for development of a generalized set of findings. A quantitative research approach also allows the researcher to validate relationships and to test hypotheses which made it a more suitable approach in this study.

3.5 Research Design

According to Leedy and Ormrod (2001), a research design is the complete strategy for attack on the central research problem. Research designs provide the overall structure of the procedures that the researcher follows, the data that the researcher collects and the data analysis that the researcher conducts. Simply put, a research design is the planning of how the data is collected and analyzed (Welman, Kruger & Mitchell, 2006). According to Yin (2009) a research design is the logical sequence that connects the empirical data to a study's initial research questions, and ultimately, to its conclusions. The present study adopted a quantitative non-experimental research design where there was utilization of existing data. Quantitative non-experimental research is research that lacks the manipulation of an independent variable, random assignment of participants to conditions or orders of conditions, or both (Yin, 2009).

The non-experimental design is appropriate when the researcher has a specific research question or hypothesis about a causal relationship between two variables and it is

possible, feasible, and ethical to manipulate the independent variable and randomly assign participants to conditions or to orders of conditions (Yin, 2009). This design was appropriate for this particular research because it describes current existing characteristics of a research question such as achievement, attitudes, relationships, size, amongst others, which the researcher is focused on. Additionally, a non-experimental design focuses on a statistical relationship between two variables but does not include the manipulation of an independent variable.

This kind of research takes two basic forms: correlational research and quasi-experimental research, and the researcher used the former. Correlational research design describes the relationship between concepts, but they do not imply causation. Many factors may be influencing the results of a correlational study, for example in this study, a negative correlation may exist between class size and learner achievement or performance, however, other factors like teacher effectiveness, teacher efficacy, resources available may exist as additional factors. Deductive logic was used, and the design was suitable for phenomena that have been well-developed with regard to theory and concept.

3.6 Population

Population is the total number of possible units or elements that are included in the study (McClendon, 2004). Furthermore, Hair *et al.*, (2008) strongly agree that a population is an identifiable set of interests to the researcher and related to the phenomena under study. It entails the specification of the survey group which is under investigation, and these specifications define the elements that belong to the target group and those that are not to

be included (Flick, 2009). In that respect, this study sought to explore the correlation between class size and learner achievement in King Williams Town educational district. Therefore, the population (N) of the study is made up of all the rural and urban schools in the King Williams Town Educational district. The total number of the rural schools is 72, and urban schools are 48, making a total of 120 high schools in King William's Town education district.

3.7 Sample and Sampling

Sampling is defined as the process of selecting a few participants (a sample) from a bigger group (the sampling population) to become the basis for estimating or predicting a fact, situation or outcome regarding the bigger group (Cooper & Schindler, 2003). Various authors are in strong agreement that a sample is a small part of the population with the same attributes as those in the entire population which can be analyzed to make various decisions about a particular population (Sekaran, 2004). The main idea of sampling is that by selecting some elements of a population, the researcher can draw conclusions about the entire and defined group of elements which is the target population (Wellington, 2008). Hence, data gathered about a sample will be used to accurately make decisions about the population. The subsections that follow provide details on the sampling procedures and sampling techniques used in this study.

3.7.1 Sampling procedure

Various researchers use probability and non-probability sampling procedures for sampling participants when they are conducting their studies so as to save costs and time.

Probability sampling entails that all members in the population have an equal chance to be chosen for the study (Cohen, Manion & Morrison, 2007). Thus, the selection of participants from the population was random. Various research designs such as simple random sampling, systematic sampling, stratified sampling and cluster sampling are used in probability sampling (Neuman, 2006). Non-probability sampling is the opposite of probability sampling where elements in the population have no equal chance to be selected for the sample (Cohen *et al.*, 2007). This study adopted a probability sampling procedure to obtain the sample of schools for study.



3.7.2 Sampling Technique

Stratified sampling is a method that involves the division of a population into smaller groups known as strata (Cohen & Schindler, 2008). According to Wellington (2008), strata are a subset of the population which is being sampled. A stratum is formed based on members' shared elements or characteristics Wellington (2008). In this case, there is one stratum for urban schools and another stratum for rural schools which were obtained from the total population of all high schools in King Williams Town. These subsets of the strata are then pooled to form a random sample. Thus, stratified sampling was used to divide the schools into two different strata.

To obtain the sample, a list of all Grade 12 schools was obtained from the education district offices, and then the schools were divided into two strata. One stratum comprised of all Grade 12 rural schools while the other stratum comprised of all Grade 12 urban schools. The urban stratum comprised of those schools located in town and those that fall

within the 15 kilometer radius from King Williams Town. The rural stratum comprised of schools that are located outside the 15 kilometer radius from King Williams Town. To obtain the final sample of the study, simple random sampling was done in each stratum. A random sample from each stratum was taken in a number that is non-proportional to the stratum's size when compared to the population. At the end, the final sample of the study comprised of ten (10) Grade 12 rural classes and ten (10) Grade 12 urban classes.

3.8 Access to the participants.

To gain access to the research sites and participants, the researcher sought permission from the District Department of Basic Education, the District Director, and the school principals. A letter was written to the District Education Office to inform them about the research and to request permission to access the schools. Permission was granted for the research to take place (see appendices 1, 2, 3, 5 and 6). At the school level, the school principal took the responsibility of making available relevant records needed by the researcher. .

3.9 Data Collection

Data collection is the process of gathering and measuring data on variables of interest, in an established and systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes (Cooper & Schindler, 2008). Data collection is an important aspect of any type of research study, and inaccurate data collection can impact the results of a study and eventually lead to invalid results. However, data collecting methods vary from one discipline to the other, but the level of accuracy

should be maintained at all cost. Data collection methods for impact evaluation vary along a scale. At the one end of this scale are quantitative methods, and at the other end of the scale are qualitative methods for data collection. Thus, the present study is focused on quantitative forms of collecting data from the participants.

3.9.1 Data Collection instruments

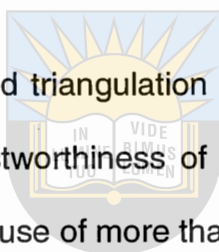
Records were used as the main data collection instrument in this study. Analysis of records is also another method used to gather information in research when the researcher wants to obtain a deeper understanding of a phenomenon (Churchill & Brown, 2007). Analysis of records entails reviewing records that are relevant to a study. The researcher used records for analysis as a faster way to access a lot of relevant information available.

The data for determining the relationship between class size and learner academic achievement was gathered from written records from the selected schools. Class registers, mark schedules and school reports from 2012 to 2013 school terms were the records used to gather data. Class registers outline the number of learners in each class as well as the number of days a learner had to attend class per given term. This enabled the researcher to get an insight of the total number of learners in each class as well as the student teacher ratio as it the key to learner achievement.

Mark schedules from 2012 to 2013 academic year were also used in this research as they reveal the performance of each learner and the overall performance of that particular class relative to others in rural areas and in the whole district. Moreover, class teacher ratio was

a point of reckoning as it contributes to the performance of the learners. Last but not least, the researcher used school reports as a data collecting instrument. As a source of data, school reports gave the researcher a clear understanding of the achievements of various learners both in their respective classes and their overall performance in their respective schools. Additionally, the researcher managed to acquire the school's report on progress of the grade 12s from the various schools management, and this augmented the research progress as it answered more questions.

In this respect, the researcher used **triangulation** of the above mentioned data collection instruments so as ensure the trustworthiness of the study. According to Hitchcock and Hughes (1995), triangulation is the use of more than one method of data collection within a single study as it enables concrete facts to be made.



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3.10 Data analysis

3.10.1 Record Analysis

A record is any document or other source of information compiled, recorded or stored in written form or on film, or by electronic process, or in any other manner or by any other means so as to act as a piece of evidence of activities performed, events occurred, results achieved or statements made (McMillan & Schumacher, 1993). Thus in this research, examining the records of the various schools enabled the researcher to find out about the correlation between class size and learner achievement. In this regard, Fraenkel and Wallen (1993, p. 389) state, "a person's or groups' conscious and unconscious beliefs, attitudes, values, and ideas are often revealed in the documents they produce". To

reiterate, this study used class registers, school reports and mark schedules as the primary sources of gathering data, and various documents were used to support these primary sources. An analysis of the data collected from the mark-schedules and reports was observed and done where the researcher had to draw conclusions as to whether class size is related to learner achievement, and whether the relationship has any effect and practical significance.

3.10.2 Pearson Correlation analysis

Pearson Correlation analysis was used to determine the relationship that exists between the study variables. Pearson correlation analysis was also used to measure the strength of association between the two ranked variables or categorized variables which are small classes and large classes. Data gathered was analyzed, and conclusions were reached to determine whether there is a relationship in the study variables. Since the study is investigating the relationship that exists between certain variables, Pearson Correlational analysis was found to be useful since it analyzes data which is concerned with relationships of variables.

3.10.3 T-testing

Significance testing which is known as t-testing was used to test for the significant differences in class size and academic achievement between urban and rural schools. The t-test was also used to compare the actual difference between the two means of the two strata's in relation to the variation in the data. The t-test deals with the problems associated with inference based on "small" samples usually less than 30 as in this case

the two strata have a total of 10 high schools each. The t-test assesses whether the means of two groups are statistically different from each other. This analysis is appropriate whenever a researcher wants to compare the means of two groups. Furthermore, it can be used to compare one variable between two groups that is, class size and learner achievement. The t-test was used by the researcher because the null hypotheses of the two variables were the same, and the responses in each group were independent of those in the other group, whilst the distributions of the variables of interest were normal.

3.10.4 Regression

The regression model was used to test whether the geographic location of the school has an interaction/moderating effect on the association between class size and academic performance. Regression analysis is a statistical technique for studying linear relationships. It is characterized by one particular variable that we are interested in understanding or modelling, whereby in this case, the dependent variable is learner-achievement. Additionally, it is characterized by other variables that might be useful in predicting or modeling the target variable that, in this case, might be teacher inefficiency, teacher experience, available teaching resources to mention but a few. However, in this study, the variable predicting or modeling academic achievement is class size. A regression analysis is done for one of two purposes: in order to predict the value of the dependent variable for individuals for whom some information concerning the explanatory variables is available, or in order to estimate the effect of some explanatory variable on the dependent variable.

3.10.5 Effect size and practical significance

The effect size analysis was done to establish the practical significance of the relationship between class size and learners academic achievement. According to Flick (2009), effect size is a simple measure for quantifying the difference between two groups or the same group over time, on a common scale. Most commonly used in an educational setup, effect size is one way to measure the effectiveness of a particular intervention. As in this study, effect size enabled the researcher to measure both the Improvement (gain) in learner achievement for a group of learners and the variation of student performances expressed on a standardized scale. Effect size is calculated by taking the difference in two mean scores and then dividing this figure by the average spread of student scores (i.e. average standard deviation*). The most common effect-size measure is the correlation/regression coefficients.

3.11 Validity of the study

In attempt to minimize errors in measurement, there is need to ensure construct validity. Construct validity refers to the extent to which a measure adequately assesses the construct it purports to assess (Nunnally & Bernstein, 1994). Construct validity is the term given to a test that measures a construct accurately (Guion & Highhouse, 2006). Construct validity is evaluated by empirically testing the hypothesis of the study. If the alternative hypotheses of this study are accepted while rejecting the null hypotheses, we can prove that there is evidence of construct validity (Struwig & Stead, 2004). The constructs that were validated in this study were the research variables which are class size and learner

achievement. If observed relationships match predicted relationships, then the evidence supports the construct validity of the interpretation. This is the case with the proposed study that seeks to examine the relationship between two constructs: class size and achievement. If the results of the study match the predicted results, then the study is said to be construct valid.

3.12 Reliability

Reliability refers to the consistency of a measure (Patton, 2002). The researcher ensured that the study is reliable. The research is considered to be reliable if the same results are obtained repeatedly when the questionnaire is re-administered/ or tested repeated. One way the researcher ensured reliability of this study was by drawing an accurate representation of the sample. Furthermore, a pilot study was conducted first then later the study was conducted. The results yielded the same results as the pilot study, therefore, the study is considered to be reliable. The researcher also ensured that the research records used for analysis are reliable and have not been tampered with.

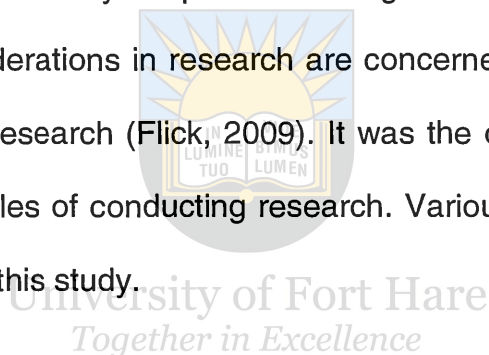
3.13 Delimitation of study

Delimitations in research are those characteristics selected by the researcher to define the boundaries of the study (Briggs & Coleman, 2007). Thus, one of the delimitations of the study is that the study looked at the Grade 12's rural and urban schools only. No other classes were included in the study since it was only limited to grade 12 schools only. The other delimitation was that the study was conducted only in high schools of King William's Town education district. No other schools from other districts were included in this study.

The variables that were under study are class size and learner academic achievement. The data that was used for this study was obtained from the records from 2012 to 2013 only.

3.14 Ethical considerations

In undertaking research, researchers obtain information from participants who are normally not part of the research process (McMillan & Schumacher, 2010). It is therefore the researcher's ethical responsibility to protect the rights and welfare of the sources of information. Ethical considerations in research are concerned in minimizing harm while in turn increase benefits in research (Flick, 2009). It was the obligation of the researcher to respect the ethical principles of conducting research. Various ethical principles discussed below were adhered to in this study.

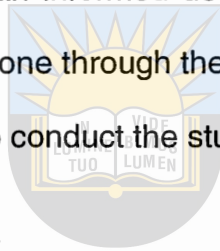


3.14.1 Permission to conduct study

Firstly, approval to conduct this study was obtained from the institutional ethics committee at the University of Fort Hare. Furthermore, the researcher sought permission to conduct this study from the various schools' research committees. After obtaining the clearance, the researcher asked permission to conduct the research from the Department of Basic Education offices in King Williams Town since this is where the study took place. Moreover, a letter requesting permission to conduct the empirical survey was written to the principals of the various schools clearly stating the purpose of the study.

3.14.2 Informed Consent and Voluntary Participation

According to Parahoo (2006), informed consent is the process of agreeing to take part in a study based on access to all relevant and easily digestible information about what participation means, in particular, in terms of harms and benefits. To ensure compliance with the ethical principles of informed consent, the Education District Head and relevant people from the education district were informed of the true nature of the study and its objectives so that they can make an informed decision either to allow this study to take place. This informed consent was done through the application letter which was sent to the district heads to grant permission to conduct the study.



3.14.3 Privacy and confidentiality

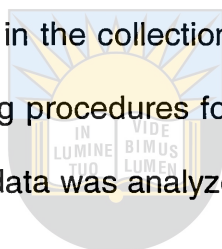
When conducting a study, it is very important to conduct research in a principled way to avoid informant stress, undesirable publicity and humiliation. Thus, according to Maree and Westhuizen (2007) essential ethical aspects relate to issues of confidentiality, privacy of the results, findings of the study, and the protection of the participants' identity and keeping it anonymous, together with and reassuring them that the research will not harm them in any way.

Privacy and confidentiality of the records that is school, reports, class registers, mark schedules to mention but a few, was guaranteed during the data collection process. The records that were obtained from the schools were kept strictly confidential. No other person besides the researcher had access to the records used in this study. To ensure

anonymity of the schools that were used in the study, symbols or pseudonyms, rather than real names, were given to them so as to avoid them being recognized.

3.15 Chapter Summary

This chapter has explained the research design, location of the study, instruments of the study and selection of respondents. In the last section, the data collection process and data analysis are explained. In conclusion, it has been noted that a research design involves all the processes involved in the collection of data, including the population, how respondents are identified, sampling procedures followed, and the data collection method used and also highlighted how the data was analyzed.



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CHAPTER 4

PRESENTATION AND DISCUSSION OF THE FINDINGS



4.1 Introduction

The chapter introduces the findings of the study that was conducted on the various schools on the phenomena of class size and how it relates to learner academic achievement. The findings of the study conducted were used to answer various research questions highlighted in chapter one and three. The research attempted to answer the following research questions: Is there a significant relationship between class size and learner academic achievement in Grade 12 schools in the KWT education district? What is the effect size of the relationship between class size and learner academic performance in schools in the KWT district? Is the effect size of the relationship between class size and learner academic performance significantly different between urban and rural settlement schools? Does the location of the school have an interaction effect on the association between class size and learners' academic performance in schools in the KWT education

district? What is the practical significance of the relationship between class size and learners' academic achievement in schools in the KWT education district?

This chapter focuses on the presentation of data and discusses the key findings of the relationship that exists between class size and learner academic achievement. Furthermore, data on the significant differences in class size and academic achievement among grade 12 between urban and rural schools is presented in this chapter. The analysed data that is presented in this chapter as findings was collected from 10 urban and 10 rural schools. The majority of the findings presented emerged from the data collected through class registers, mark schedules and school reports from the various schools. This chapter begins with a description of the schools used in the study. Following these, inferential statistics are used to describe the findings of the tested hypotheses. Relevant literature is used to explain, justify and account for trends in the findings and to compare the findings of the present study with the finding of previous studies on the bearing that class size has on academic achievement.

4.2 Findings on class size and academic achievement

4.2.1 Significant Correlations between class size and academic achievement

The hypothesis that informed the computation of the correlations is that class size is related to the academic achievement of Grade 12 learners. The correlation coefficients were calculated using Pearson-product moment correlation. The confidence levels on the SPSS version 21 were set such that significant correlations with 95% and 99% confidence levels are flagged so that conclusions could be drawn about the relationships, with only

5% and 1% of the associations attributed to chance. The sizes of correlations indicate the magnitude of the relationships. In interpreting the sizes of the correlation, the following guidelines by Cohen, Manion, and Morrison (2007) were used:

- Small: $r = 0.1 - 0.3$
- Moderate: $r = 0.4 - 0.6$
- Large: $r = 0.7 - 0.8$
- Perfect: $r = 0.9 - 1.0$

The table below 4.1 shows the correlations between class size and achievement of Grade 12 learners for the 2009 to 2013 period. Overall, the results from the correlations indicate that there is a negative relationship that exists between class size and academic achievement in Grade 12 classes. For example, using the Pearson-product moment correlation, the following statistically significant relationships between class size and learners academic achievement in Grade 12 were found:

Academic Years	correlation	Significance	Significance Level
2009	-0.658	0.002	Significant at the 0.01 level
2010	-0.380	0.098	Not significant
2011	-0.599	0.005	Significant at the 0.01 level
2012	-0.236	0.317	Not significant
2013	-0.380	0.098	Not significant

Table 4. 1: Correlations between class size and achievement of Grade 12 learners

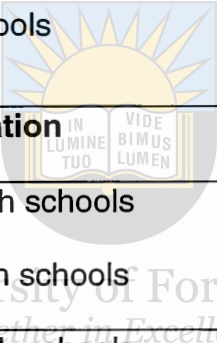
In 2009, the correlation is $r = -0.658$, $p = 0.002$, and the 2011 correlation $r = -0.599$, $p = 0.005$, supported the research hypothesis that surmised that there is a statistically significant relationship between class size and learners academic achievement. However, the 2010 the correlation is $r = -0.380$, $p = 0.098$; 2012 the correlation of $r = -0.236$, $p = 0.317$; and the 2013 correlation of $r = -0.380$, $p = 0.098$ refuted the research hypothesis in favour of the null hypothesis. The correlations of the 2009 and the 2011 results indicate that a negative relationship exist between class size and learner academic achievement in Grade 12 classes. The results indicate that when class size decreases, learner academic achievement increases. This basically means that when class size decreases then academic achievement in Grade 12 increases.

The correlations results, however, indicate that some relationships are significant while others are not significant. The correlational relationship of 2009 and 2011 indicates that a significant negative relationship exists between class size and learner academic achievement. The correlations for 2010, 2012 and 2013 indicate a non-significant negative relationship that exists between class size and learner academic achievement.

4.2.2 Significance differences using location as a sorting/categorising variable

4.2.2.1 Significant Differences in class sizes of Grade 12 urban and rural schools

Table 4.2 below shows the mean differences in the average class sizes of Grade12 learners in urban and rural high schools

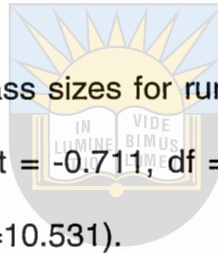


Year	Location	N	Mean	SD
2009	Urban high schools	10	36.70	10.531
	Rural high schools	10	40.20	11.478
2010	Urban high schools	10	34.20	6.697
	Rural high schools	10	36.80	10.196
2011	Urban high schools	10	31.70	7.617
	Rural high schools	10	32.50	9.396
2012	Urban high schools	10	32.00	7.775
	Rural high schools	10	33.70	9.799
2013	Urban high schools	10	32.10	6.935
	Rural high schools	10	35.00	8.907

Table 4.2: Mean differences in the average class sizes of Grade12 learners in urban and rural high schools

At a glance, the average class sizes of rural schools appear to be larger than those of urban schools. However, the difference is small with a mean difference of 3.5, at most, in 2009, and 0.8 is the least in 2011.

The t-test results show that there are no significant differences in the Grade 12 class sizes between urban and rural high schools for the 2009 to 2013 period. The significance values are above 0.05, hence the conclusion that the mean differences are not significant. For example:



In 2009, the mean score of the class sizes for rural schools ($M=40.20$, $SD=11.478$) did not differ statistically significantly ($t=-0.711$, $df=18$, two tailed $p=0.486$) from those of urban high schools ($M=36.70$, $SD=10.531$).

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In 2010, the mean score of the class sizes for rural schools ($M=36.80$, $SD=10.196$) did not differ statistically significantly ($t=-0.674$, $df=18$, two tailed $p=0.509$) from those of urban high schools ($M=34.20$, $SD=6.697$).

In 2011, the mean score of the class sizes for rural schools ($M=32.50$, $SD=9.396$) did not differ statistically significantly ($t=-0.209$, $df=18$, two tailed $p=0.837$) from those of urban high schools ($M=31.70$, $SD=7.617$).

In 2012, the mean score of the class sizes for rural schools ($M=33.70$, $SD=9.799$) did not differ statistically significantly ($t=-0.430$, $df=18$, two tailed $p=0.672$) from those of urban high schools ($M=32.00$, $SD=7.775$).

In 2013, the mean score of the class sizes for rural schools ($M=35.00$, $SD =8.907$) did not differ statistically significantly ($t =-0.812$, $df = 18$, two tailed $p=0.427$) from those of urban high schools ($M=32.10$, $SD =6.935$).

4.2.2.2 Significant Differences in the achievement of Grade 12 learners in urban and rural schools.

Table 5 below shows the mean differences in the achievement of Grade12 learners in rural and urban schools.



Year	Location	N	Mean	SD
2009	Urban high schools	10	65.00	29.261
	Rural high schools	10	38.70	21.108
2010	Urban high schools	10	63.90	28.965
	Rural high schools	10	38.00	15.797
2011	Urban high schools	10	71.00	24.558
	Rural high schools	10	49.20	23.289
2012	Urban high schools	10	74.00	17.657
	Rural high schools	10	48.60	18.674
2013	Urban high schools	10	75.60	21.986
	Rural high schools	10	47.00	25.927

Table 4. 3: Mean differences in the achievement of Grade12 learners in rural and urban schools.

At a glance, the academic achievement of urban schools appear to be better than those of rural schools. The difference is large across all the years. The results show that there are statistical significant differences in academic achievement between Grade 12 classes in urban and rural high schools for the 2009 to 2013 period. For example:

In 2009, the mean score for Grade 12 achievement for urban high schools ($M= 65.00$, $SD =29.261$) differed statistically significantly ($t = 2.305$, $df = 18$, two tailed $p=0.033$) from that of rural high schools ($M=38.70$, $SD =21.108$).

In 2010, the mean score for Grade 12 achievement for urban high schools ($M= 63.00$, $SD =28.96$) differed statistically significantly ($t = 2.482$, $df = 18$, two tailed $p=0.023$) from that of rural high schools ($M=38.00$, $SD =15.797$).

In 2011, the mean score for Grade 12 achievement for urban high schools ($M= 71.00$, $SD =24.558$) differed statistically significantly ($t = 2.037$, $df = 18$, two tailed $p=0.057$) from that of rural high schools ($M=49.20$, $SD =23.289$).

In 2012, the mean score for Grade 12 achievement for urban high schools ($M= 74.00$, $SD =48.60$) differed statistically significantly ($t = 3.125$, $df = 18$, two tailed $p=0.006$) from that of rural high schools ($M=48.60$, $SD =18.674$).

In 2013, the mean score for Grade 12 achievement for urban high schools ($M= 75.60$, $SD =21.986$) differed statistically significantly ($t = 2.660$, $df = 18$, two tailed $p=0.016$) from that of rural high schools ($M=47.00$, $SD =25.927$).

4.2.3 Predictors of achievement and practical significance

Location and class size of 2009 were modelled as explanatory variable on achievement, and 57.30% of the variation in achievement was explained by location and class size. The resulting $p=0.001$ shows that the model was significant. When location and class were modelled as the explanatory variable on achievement in 2010, 34.8% of the variation in achievement was explained by location and class size variables. The resulting $p=0.026$ shows that the model was significant.

In 2011, 52.20% of the variation in achievement was explained by location and class size. The resulting $p=0.002$ shows that the model was significant. In 2012, 38.30% of the variation in Grade 12 learners' achievement was explained by location and class size. The resulting $p=0.016$ shows that the model was significant. For 2013, 36.40% of the variation in learners' achievement was explained by location and class size. The resulting $p=0.021$ shows that the model was significant.

The geographic location of the school was found to be a mitigating variable between class size and Grade 12 learners' academic achievement. In the regression models for 2009 through to 2013, location significantly correlates with academic achievement even in 2010, 2012 and 2013 when class size did not significantly relate to grade 12 learners academic achievement.

4.2.4 Findings on the practical significance of the Differences in Achievement

The effect size statistic was used to compute practical significance of the difference in Grade 12 learners' achievements. Using Cohen's d-values, a determination could then be

made as to the practical importance or clinical significance of the difference in terms affecting decisions to be made about the costs, requirements and goals. In interpreting Cohen's d-values, the framework below was used:

0 – 0.20 weak effect

0.21 – 0.50 modest effect

0.51 – 1.00 moderate effect

Larger than 1.00 strong effect (Cohen, Manion, and Morrison, 2007)

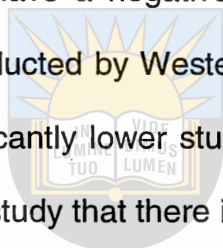
In 2009, the effect size $d=1.15$ suggests that location of the school has a strong effect on Grade 12 learners' academic achievement. Again, in 2010, the effect size $d= 1.11$ suggests a strong effect. However, in 2011 the effect size $d=0.91$ suggests a moderate effect while in 2012, $d= 1.40$ and 2013, $d=1.19$ the location of the school had strong effect on Grade 12 learners' academic achievement.

4.3 Discussion of the findings

The findings of the study indicate that a negative relationship exists between class size and learner academic achievement. The results of the relationship from 2009 to 2013 shows that a negative correlation exists between class size and learner academic achievement. These results indicate that when class size decreases, learner academic achievement increases. This shows that classes with a smaller number of learners are characterised by learners who perform better as compared to those classes with a large

number of learners. The relationship between class size and learner academic achievement is negative in all cases.

Various recent studies have highlighted a negative relationship between class size and learner academic achievement. Bedard and Kuhn (2008) examined students' evaluations of economics courses from 1997 to 2004. They found a large, highly significant negative impact of class size on student achievement. Similarly, Walia (2008) highlighted in his study that class size is found to have a negative and statistically significant impact on student achievement. A study conducted by Westerlund (2008) reported that increases in the size of classes leads to significantly lower student achievement. Thus, these studies support the findings of the current study that there is a negative relationship between class size and learner academic achievement.



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Such findings are consistent with the findings of previous authors. Historically, researchers have found that a positive correlation exists between smaller class sizes and student achievement (Glass, Cahen & Smith, 1978). The first meta-analysis by Glass *et al.*, (1978) dealt with the impact of class size on student achievement. Glass *et al.*, (1978) conducted a meta-analysis of over 80 class size studies and found that a relationship between class size and student achievement emerged. Though the study is outdated, it showed that historically, class size has been linked to learner academic achievement.

An important outcome of the Glass *et al.*, (1978) meta-analysis was the finding that the greatest gains in achievement occurred among students who were taught in classes of 15 students or less. Glass *et al.*, (1978) noted that as class size increases, achievement

decreases. This is exactly what the current study found as there is a negative relationship between class size and learner academic achievement. Carter (1994) concurs with Glass and Smith (1979) and refers to the three categories of issues affected by class size as behavior management, individualization and curriculum. Carter (1994) concurs with the findings of Glass *et al.*, (1978) and those of the present study by adding that smaller classes make discipline easier as the teacher spends more time teaching and less time policing.

International studies on effective schooling indicate that class size impacts on the teaching and learning environment, with larger classes performing poorly in comparison to classes with fewer learners (Hattie, 2005). This shows that when the class size increases, learners' academic achievement drops, and when class sizes decrease, learner academic achievement improves. A study by Chisholm (2005) reported that smaller classes are often perceived as allowing teachers to focus more on the needs of individual students and reducing the amount of class time needed to deal with disruptions. The study reported that when a class is small, learners' academic achievement improves, which concurs with the results of the present study.

The results of this particular study also support the findings of Rice (1999) who reported that smaller classes are seen to be directly linked to positive learner academic achievement. Wildeman (2005) found out that students in smaller classes benefit more than learners from bigger classes. Gilman and Kiger (2003), Biddle and Berliner (2002) reported that learners from appropriately sized classes benefit more academically as they

perform better than children from large classes. These findings correspond with the findings of this study as learners from smaller classes are shown to achieve or obtain better grades than learners from bigger classes. There are increased benefits to learners when appropriately sized classes are established (Biddle & Berliner, 2002). Achilles (1999) reported that such a negative relationship exists not only because the classroom is more manageable, but the impact on children can be targeted to meet their individualized needs. Smaller classes are seen to be directly linked to positive learner academic achievement (Wildeman, 2005).



The findings of this study refute the findings of Van Allen (1990) who asserted that the quantitative products which are the monetary gains afforded by increased enrolment far outweigh the qualitative product of well-educated and knowledgeable learners. Van Allen (1990) pointed out that there are returns to investing in smaller classes for learners. This authors' study indicated that smaller classes have more positive consequences than larger ones, no matter how small (Van Allen, 1990).

The findings above support the findings of the present study as there is a negative relationship between class size and learner academic achievement. If the class is small, learners achieve more academically as compared to when the class is bigger. Moreover, other authors who support the findings of this study are: West and Woessmann (2003) and Cahen, Filby, McCutcheon and Kyle (1983) who agree that when class size reduction programmes are well-designed and implemented in the American primary grades, students' achievement rises as class size drops. This shows that when class size

decreases, learners' academic achievement increases, as is indicated by the findings of the current study.

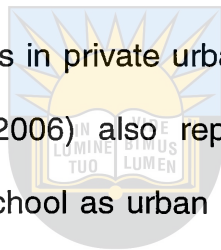
The findings of the study in 2010, 2012 and 2013 indicated a negative non-significant relationship between class size and learner academic achievement. A negative relationship exists, although this relationship is insignificant. This shows that though a negative relationship exists between the study variables, the relationship is insignificant. These findings may be consistent with the findings of Krueger (2002) who reported that the overall evidence of the effects of differences in class size on learner achievement is weak. Hanushek (1999) highlighted that an insignificant relationship exists between class size and learner academic achievement because other factors other than class size influences student learning. While it seems a smaller class size benefits student achievement, research indicates that the impact of class size paired with other teacher variables may also play a part in student success, specifically teacher education, teacher quality and teaching style (Rice, 1999).

Krueger (2002) highlighted that a weak relationship exists between class size and learner academic achievement as factors such as: the level of initial intelligence and learner aptitude, the length of time dedicated to the subject, availability of resources such as public address gadgets and other audio-visual aids, learner and teacher attitudes, the culture in the institution and a host of other factors play a part in influencing the learners academic performance. These researchers argue that class size, coupled with other variables, will affect learner achievement and not class size on its own.

The findings correspond with the findings on the research that suggests there is a weak relationship between class size and students' performance (Piketty & Valdenaire, 2006). These authors argue that not all learners are influenced by the issue of class size. These researchers argue that only those learners in elementary schools are influenced by class size as compared to old learners, where other variables apart from class size play a significant role in influencing learner achievement. As reported by Finn (1998), class size seems to be more important in the earlier years of schooling than it is for 15-year-olds. Therefore, the insignificant relationship between class size and learner academic achievement in 2010, 2012 and 2013 may be attributed to the fact that other variables in addition to class size affect learner academic achievement.

The study also found that rural area classes are bigger than urban area classes. The difference is, however, not big. The findings of the study concur with the findings of other authors such as Makola (2005) who observed that rural-based district schools tend to have larger class sizes than urban-based district schools. Data analyzed across geographical locations to ascertain differences between schools in urban areas and rural schools indicated that most black teachers who are responsible for teaching learners in most rural areas are responsible for large classes of over 46 learners (Makola, 2005). A report by The Department of Basic Education (2011a) further supports this when it reported that independent urban schools have an average class size of 30 as compared to rural public schools who have an average class size of 45. The findings of the study support these previous findings that large classes are more dominant in rural areas than in urban areas.

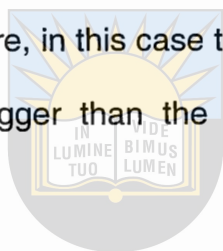
From the results of the study, the location of the school has a huge impact on the learner's academic achievement. The results shows that learners from urban areas perform better academically as compared to learners from rural areas. This can be attributed to the fact that there are large classes in rural areas as compared to urban areas. These findings support the finding of various authors who report that various characteristics of the school such as the location have an important impact on academic performance (Gamoran & Long, 2006) and Behrman (2010). A study by Vandenberghe and Robin (2004) reported that students attain better outcomes in private urban schools than in public rural schools. Opdenakker and Van Damme (2006) also reported that academic achievement is influenced by the location of the school as urban schools perform better than learners in rural schools.



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Talbert (1993) and Young (1998) further supported this claim when they reported that it is the differences in the characteristics of urban and rural areas that account for most of the differences in academic achievement between learners from rural and urban schools. These studies supported the theory that learners in urban schools perform better than learners in rural schools as they have adequate resources to perform better as compared from learners in rural classes. Woßmann (2010) further reported significant differences in the achievement of students attending rural and urban schools. A study by Nielsen, Nashon and Mutonyi (2005) in Columbian schools students in rural schools are falling behind their urban counterparts.

Due to the fact that location of the school was found to have a significant impact on learner's academic achievement, learners can attribute their failure or pass to the geographical location of the school. The attribution theory comes into existence in this scenario as learners may attribute their success to the external environment. The learners from the rural areas may attribute their failure to the fact that their school is located in the rural areas. Moreover, learners from the rural schools may attribute their lower levels of academic achievements to the size of the class. Rural schools are found to be slightly bigger than urban schools. Therefore, in this case the learners may attribute their failure to the fact that their classes are bigger than the urban school classes, thus hindering effective learning.



4.4 Chapter summary

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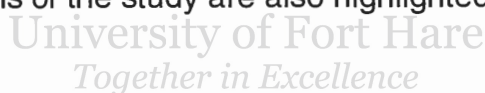
This chapter provided the results obtained from data collection. In this chapter, the results of the study were interpreted by analysing the findings that enabled conclusions to be drawn from such findings. The findings of the present study were related to previous findings. The next chapter provides the conclusion and recommendations drawn from the analysis of this study.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

While the previous chapter presented the results of the data analyses, this chapter draws conclusions of the entire research project. Recommendations for education administrators and for future directions are provided in an attempt to improve learners' academic achievement. The limitations of the study are also highlighted.

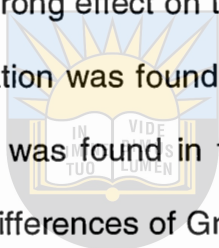


5.2 Summary of the research

The study found a negative relationship between class size and learner academic achievement. This indicated that when class size increases learner academic achievement decreases or learner academic achievement increases when class sizes decrease. This shows that class size has a negative relationship on learners' academic achievement. The results of the relationship between class size and learner academic achievement for the year 2009 and 2011 are negative and significant, whereas the ones for 2010, 2012 and 2013 are negative but insignificant. This was attributed to negligible differences in the class sizes of urban and rural high schools in the King William's Town education district for the above-mentioned years. This shows that in 2009 and 2011, a significant negative relationship existed between class size and learner academic achievement whereas in

2010, 2012 and 2013, a non-significant negative relationship exists between class size and learner academic achievement.

The study also found geographical location to be a mitigating variable between class size and Grade 12 learners' academic achievement. There is a strong correlation between geographical location and learner academic achievement. The learners from rural classes achieved poorly, academically, as compared to learners from urban classes. The location of the school was found to have a strong effect on the academic achievement of Grade 12 learners. The effect size of the location was found to be strong in the years 2009, 2010, 2012 and 2013. A moderate effect was found in the year 2011. This suggests that the location has a strong effect on the differences of Grade 12 learners' achievement between urban and rural schools.



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5.3 Conclusions

The study concluded that a negative relationship exists between class size and learners' academic achievement among Grade 12 classes in King Williams Town District. Both the rural and urban classes indicated a negative relationship between class size and learner academic achievement. However, in instances where the difference in class size between urban and rural high school is insignificant, class size does not explain or account for differences in learners' academic achievement between urban and rural high schools.

Class size and geographical locations of the schools were found to have an effect on the Grade 12 learners' academic achievement. Class size was found to have a weak effect on academic achievement between rural and urban classes. However geographical location

was found to have a strong effect on Grade 12 learners' academic achievement between rural and urban classes.

The study also concludes that the negative relationship between class size and learner academic achievement is significant under certain circumstances, specifically when paired with a host of other mitigating variables such as the geographic location of the school. The relationship between the study variables in 2009 and 2011 was significant, whereas in 2010, 2012 and 2013, the negative relationship was insignificant. The insignificance was accounted for by negligibility of the differences in class sizes of urban and rural high schools.



5.4 Recommendations

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From the findings of the study, the researcher recommends the following:

5.4.1 In order to improve learner academic achievement in schools, class sizes must be reduced. This is based on the fact that the study findings indicated a negative relationship between class size and learner academic achievement which shows that when class size is reduced, learners' academic achievement improves.

5.4.2 Policies and strategies must be put in place in an attempt to reduce class size to an optimum size such that teachers can effectively render their service to the learners. Class reduction practices in schools will play a significant role in improving learners' academic achievement.

5.4.3 Not only class size will improve the relationship that exists between class size and learners' academic achievement but other practices should also be implemented to improve learner' academic achievement after reducing the classes. For instance, reducing the classes and making them small while at the same time not recruiting more teachers plays no significant difference. Teachers will still be with the same load they were carrying previously. Therefore, when classes are reduced and learners increase in number, schools must also recruit more teachers to cater for the classes that have been increased due to class reduction. This will reduce the load that certain teachers will have and can result in the efficient and effective delivery of education to the learners thus improve achievement.

5.4.4 There needs to be improvement of resources at the schools, specifically, the physical environment to facilitate conducive learning and attract more and better equipped teachers who might be running away from the schools because they are located in the rural areas.

5.4.5 Since classes cannot relocate from rural areas to urban areas, there must be mechanisms put in place to improve learner academic achievement in rural schools. Rural school managements must implement practices that can be useful in improving academic achievement at the rural schools. It has been noted that it may not be the location of the school itself that results in poor academic achievement of learners in rural schools, but the differences in the characteristics of urban and rural areas that cause variation in academic achievement. Therefore, in light of the above, the best way to improve academic achievement in rural schools may be to change the characteristics of the rural schools to match urban school characteristics.

5.5 Further research

Further research needs to be done as inconsistent results are still emerging on the relationship between class size and learner academic achievement. The recommended study would have to sample schools where small and large class sizes are selected for comparative purposes.

Additionally, in the current study other factors that might have an effect on learner academic achievement were not holding constant. Therefore, in the future, it is recommended that researchers could conduct a study on the relationship that exists between class size and learner academic achievement. Such research could investigate other factors that might have an effect on the relationship between the variables constant. This will enable them to make concrete conclusions on the causes and effects between the study variables, namely class size and academic achievement.

5.6 Chapter summary

The chapter provided the conclusions and recommendations of the study. The study found a negative relationship between class size and learner academic achievement. The researcher concludes that the relationship between class size and learners' academic achievement is negative and significant under certain conditions such as locality of the school. That is, the location of the schools does seem to have an impact on the learner's academic achievement as reflected on the effect size results. Therefore, one important conclusion from the study is that when the size of classes decreases, learner academic

achievement increases, and location of the school is the mitigating variable in explaining the learners' academic achievement.

5.7 Reflection

Reflecting on the findings of the study, this research answered the research questions and also succeeded in terms of meeting the objectives of the study. All the hypotheses were tested, and conclusions were made based on the findings of the statistical analysis methods employed. The theories used to support this study are relevant as they all allude to the fact that a number of factors do affect learners' academic achievement. The results of this study show a significantly negative relationship that exists between class size and learners' academic achievement in years where there is variability in class sizes, and insignificant relationships where class sizes are more or less the same. This shows that class size is not the only variable that affects learner academic achievement. The geographic location of the school is an example of an additional variable that affects learners' achievement. Therefore, the theories employed in the study are relevant to this study.

This chapter also made recommendations for further study. These are that such a study could increase the sample. In addition, such a study could include other schools from other provinces so as to validate the results of this study. The research only focused on schools in King Williams Town, so increasing the sample size can enable the researcher to make generalisations of the entire population which will be all Grade 12 schools in the country.

Moreover, a longitudinal study should be conducted of the same group of students from Grade 7 up to Grade 12 rather than using different groups of learners and their academic achievements as in this study. The same group of students must, therefore, be exposed to different classroom sizes so as to determine if class size does have an effect on the learner's academic achievement. This is more of an experimental design where learners will be exposed to the different classes and observe if there will be differences in academic achievement.



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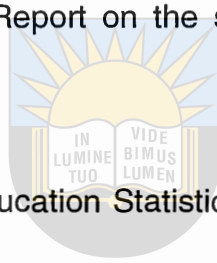
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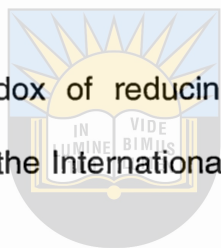
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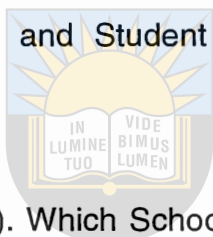
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Appendix 1: Application to conduct Research letter



Province of the
EASTERN CAPE
EDUCATION

45 Elias Street King William's Town, 2600, Private Bag 274445, KWT, 6600
REPUBLIC OF SOUTH AFRICA, Website: www.education.gov.za

Email: netawuto@education.gov.za or netawuto@education.gov.za

Ref. No.

Tel.: 043 – 604 3216

Enquiries: N.M. Paatje

Fax: 0865486357

Mr L. Rusi

King William's Town

Dear Sir



APPLICATION TO CONDUCT RESEARCH

Permission is hereby granted for you to conduct research in schools of your choice in the King William's Town District for the purpose of fulfilling the requirements for Masters in Education at the University of Fort Hare.

Together in Excellence

Please be informed that permission is only granted provided that school activities are not disrupted.

We wish you well in your endeavors.

Yours faithfully

F.C. SOKUTU

DISTRICT DIRECTOR:KWT

Mr L N Rusi

0769835052

Building blocks for growth



Province of the Eastern Cape



Appendix 2: Request for permission conduct research letter 1

Teaching and Learning Centre
Teaching Development Unit

Office #202
Henderson Hall
Alice Campus

Tel: 040 625 2703
Fax: 040 625 2986
Email: university@ufh.ac.za



TO:

The District Director
The Department of Basic Education
King Williams Town Education District

03 March 2014

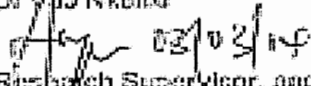
Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

Mr Lazola Rusi is carrying out his research in fulfillment of the requirements for the degree of Master of Education at the University of Fort Hare. The research is on the relationship between class size and learner academic achievement.

In terms of this research he needs to collect data from school enrolment and learner achievement records in schools in the district. It would be appreciated if he could be given access to those records in the district and selected schools so that he is able to carry out this research.

Any further help canvassed would be appreciated. Mr Rusi would be happy and willing to share the outcomes of this research with the school.

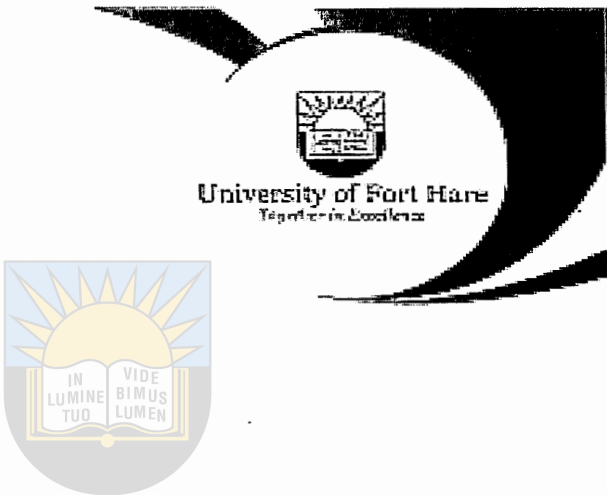
Dr YJJ Nkomo

Research Supervisor, and
Manager (A&E)
Teaching and Learning Centre

Appendix 3: Request to conduct research letter 2

Teaching and Learning Centre
Teaching Development Unit

Office #202
Henderson Hall
Alice Campus

Tel: 049 609 2701
Fax: 086 626 6986
Email: vnkonki@ufh.ac.za



TO:

The Principal
The Department of Basic Education
King Williams Town

03 March 2014

Dear Sir/Madam

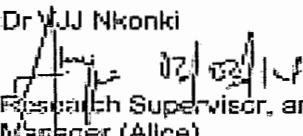
University of Fort Hare
Together in Excellence

REQUEST FOR PERMISSION CONDUCT RESEARCH

Mr Lazola Rusi is carrying out his research in fulfillment of the requirements for the degree of Master of Education at the University of Fort Hare. The research is on the relationship between class size and learner academic achievement.

In terms of this research he needs to collect data from school enrolment and learner achievement records in schools in the district. It would be appreciated if he could be given access to these records in your school so that he is able to carry out this research.

Any further help canvassed would be appreciated. Mr Rusi would be happy and willing to share the outcomes of this research with the school.

Dr VJJ Nkonki

Research Supervisor, and
Manager (Alice)
Teaching and Learning Centre

Appendix 4:Request for permission to conduct research letter 3

VICTORIA MXENGE HIGH SCHOOL

P.O. BOX 418, KING WILLIAMS TOWN, 5600
ENO: Z Z. DLOVA - 082 715 4193
e-mail: admin.victoriamxenge@vodamail.co.za

05 MAY 2014

RESEARCH SUPERVISOR AND MANAGER
UNIVERSITY OF FORT HARE
TEACHING AND LEARNING CENTRE

CONFIRMATION OF RESEARCH CONDUCTED BY Mr. L. RUSI

This serves to confirm that Mr. L. Rusi conducted research in the school.
The information collected is according to the school records.

University of Fort Hare
Together in Excellence

The school wishes him success in his studies.


Z. Z. DLOVA
SCHOOL PRINCIPAL

DEPARTMENT OF EDUCATION VICTORIA N. MXENGE P.O. Box 418, King Williams Town
2014-05-05
082 715 4193
Signature: 
PRINCIPAL OF THE EASTERN CAPE

Appendix 5: Permission to conduct study

VICTORIA MXENGE HIGH SCHOOL

P.O. BOX 418, KING WILLIAMS TOWN 5000
ENO: Z.Z. DLOVA – 082 715 4155
e-mail: admin.victoriamxenge@vodata.co.za

05 MAY 2014

RESEARCH SUPERVISOR AND MANAGER
UNIVERSITY OF FORT HARE
TEACHING AND LEARNING CENTRE



CONFIRMATION OF RESEARCH CONDUCTED BY Mr. L. RUSI

This serves to confirm that Mr. L. Rusi conducted research in the school.
The information collected is according to the school records.

University of Fort Hare
Together in Excellence

The school wishes him success in his studies.


Z.Z. DLOVA
SCHOOL PRINCIPAL

DEPARTMENT OF EDUCATION VICTORIA N. MXENGE P.O. Box 418, King Williams Town
2014-05-05
Signature:  082 715 4155
STANDARD COPIES OF THIS DOCUMENT

Appendix 6:Permission to conduct study.



SIWABABALWA HIGH SCHOOL

P.O. Box 1795
King William's Town
5600

This serves to confirm that Mr L.N. Rusi visited the school in connection with the Research he is conducting.

We, as the Management of the school provided him with all the information he requested.

For more enquiries please do not hesitate to contact the school.

Yours Faithfull

W.A.SKEYI (PRINCIPAL)

Phone No. 040 654 3982

Cell No. 073 3588 047

Appendix 7: FINDINGS FROM THE ANALYSIS OF DATA

THE RELATIONSHIP BETWEEN CLASS SIZE AND ACADEMIC ACHIEVEMENT IN GRADE 12

Correlations			
		Average Class Size 09	Achievement 2009
Average Class Size 2009	Pearson Correlation	1	-.658**
	Sig. (2-tailed)		.002
	N	20	20
Achievement 2009	Pearson Correlation	-.658**	1
	Sig. (2-tailed)	.002	
	N	20	20

**. Correlation is significant at the 0.01 level (2-tailed).

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Correlations			
		Average Class Size 2010	Achievement 2010
Average Class Size 2010	Pearson Correlation	1	-.380
	Sig. (2-tailed)		.098
	N	20	20
Achievement 2010	Pearson Correlation	-.380	1
	Sig. (2-tailed)	.098	
	N	20	20

Correlations

		Average Class Size 2011	Achievement 2011
Average Class Size 2011	Pearson Correlation	1	-.599**
	Sig. (2-tailed)		.005
	N	20	20
Achievement 2011	Pearson Correlation	-.599**	1
	Sig. (2-tailed)	.005	
	N	20	20

** . Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Average Class Size 2012	Achievement 2012
Average Class Size 2012	Pearson Correlation	1	-.236
	Sig. (2-tailed)		.317
	N	20	20
Achievement 2012	Pearson Correlation	-.236	1
	Sig. (2-tailed)	.317	
	N	20	20

Correlations

		Average Class Size 2013	Achievement 2013
Average Class Size 2013	Pearson Correlation	1	-.380
	Sig. (2-tailed)		.098
	N	20	20
Achievement 2013	Pearson Correlation	-.380	1
	Sig. (2-tailed)	.098	
	N	20	20

MEAN DIFFERENCES IN CLASS SIZES BETWEEN URBAN AND RURAL GRADE 12 CLASSES

Group Statistics

Location		N	Mean	Std. Deviation	Std. Error Mean
Average Class Size 2009	Urban high Schools	10	36.70	10.531	3.330
	Rural High Schools	10	40.20	11.478	3.630
Average Class Size 2010	Urban high Schools	10	34.20	6.697	2.118
	Rural High Schools	10	36.80	10.196	3.224
Average Class Size 2011	Urban high Schools	10	31.70	7.617	2.409
	Rural High Schools	10	32.50	9.396	2.971
Average Class Size 2012	Urban high Schools	10	32.00	7.775	2.459
	Rural High Schools	10	33.70	9.799	3.099
Average Class Size 2013	Urban high Schools	10	32.10	6.935	2.193
	Rural High Schools	10	35.00	8.907	2.817

SIGNIFICANT DIFFERENCES IN THE CLASS SIZES OF GRADE 12

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Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Average Class Size 2009	Equal variances assumed	.125	.728	-.711	18	.486	-3.500	4.926	-13.849	6.849
	Equal variances not assumed			-.711	17.868	.487	-3.500	4.926	-13.854	6.854
Average Class Size 2010	Equal variances assumed	.750	.398	-.674	18	.509	-2.600	3.857	-10.704	5.504
	Equal variances not assumed			-.674	15.547	.510	-2.600	3.857	-10.797	5.597
Average Class Size 2011	Equal variances assumed	1.354	.260	-.209	18	.837	-.800	3.825	-8.836	7.236
	Equal variances not assumed			-.209	17.261	.837	-.800	3.825	-8.860	7.260
Average Class Size 2012	Equal variances assumed	.226	.640	-.430	18	.672	-1.700	3.955	-10.010	6.610
	Equal variances not assumed			-.430	17.116	.673	-1.700	3.955	-10.041	6.641
Average Class Size 2013	Equal variances assumed	.806	.381	-.812	18	.427	-2.900	3.570	-10.400	4.600
	Equal variances not assumed			-.812	16.980	.428	-2.900	3.570	-10.432	4.632

MEAN DIFFERENCES IN GRADE 12 ACHIEVEMENTS BETWEEN URBAN AND RURAL SCHOOLS

Group Statistics

Location		N	Mean	Std. Deviation	Std. Error Mean
Achievement 2009	Urban high Schools	10	65.00	29.261	9.253
	Rural High Schools	10	38.70	21.108	6.675
Achievement 2010	Urban high Schools	10	63.90	28.965	9.160
	Rural High Schools	10	38.00	15.797	4.996
Achievement 2011	Urban high Schools	10	71.00	24.558	7.766
	Rural High Schools	10	49.20	23.289	7.365
Achievement 2012	Urban high Schools	10	74.00	17.657	5.584
	Rural High Schools	10	48.60	18.674	5.905
Achievement 2013	Urban high Schools	10	75.60	21.986	6.953
	Rural High Schools	10	47.00	25.927	8.199

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SIGNIFICANT DIFFERENCES IN THE ACHIEVEMENT OF GRADE 12 LEARNERS

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Achievement09	Equal variances assumed	1.074	.314	2.305	18	.033	26.300	11.410	2.329	50.271
	Equal variances not assumed			2.305	16.371	.035	26.300	11.410	2.157	50.443
Achievement10	Equal variances assumed	3.592	.074	2.482	18	.023	25.900	10.433	3.980	47.820
	Equal variances not assumed			2.482	13.919	.026	25.900	10.433	3.510	48.290
Achievement11	Equal variances assumed	.036	.851	2.037	18	.057	21.800	10.703	-.686	44.286
	Equal variances not assumed			2.037	17.950	.057	21.800	10.703	-.690	44.290
Achievement12	Equal variances assumed	.034	.855	3.125	18	.006	25.400	8.127	8.326	42.474
	Equal variances not assumed			3.125	17.944	.006	25.400	8.127	8.322	42.478
Achievement13	Equal variances assumed	.511	.484	2.660	18	.016	28.600	10.750	6.015	51.185
	Equal variances not assumed			2.660	17.532	.016	28.600	10.750	5.972	51.228

REGRESSION RESULTS FOR 2009

University of Fort Hare

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Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.757 ^a	.573	.522	19.529

a. Predictors: (Constant), Location, AverageClassSize09

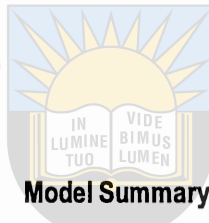
ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8691.359	2	4345.680	11.395	.001 ^b
	Residual	6483.191	17	381.364		
	Total	15174.550	19			

a. Dependent Variable: Achievement09

b. Predictors: (Constant), Location, AverageClassSize09

REGRESSION RESULTS FOR 2010



Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.590 ^a	.348	.271	22.463

a. Predictors: (Constant), AverageClassSize10, Location

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4573.265	2	2286.633	4.532	.026 ^b
	Residual	8577.685	17	504.570		
	Total	13150.950	19			

a. Dependent Variable: Achievement10

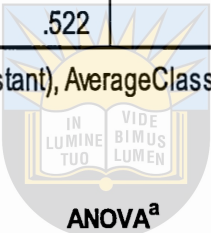
b. Predictors: (Constant), AverageClassSize10, Location

REGRESSION RESULTS FOR 2011

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.722 ^a	.522	.465	18.894

a. Predictors: (Constant), AverageClassSize11, Location



Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6617.252	2	3308.626	9.269	.002 ^b
	Residual	6068.548	17	356.973		
	Total	12685.800	19			

a. Dependent Variable: Achievement11

b. Predictors: (Constant), AverageClassSize11, Location

REGRESSION RESULTS FOR 2012

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.619 ^a	.383	.311	18.242

a. Predictors: (Constant), AverageClassSize12, Location



Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3513.244	2	1756.622	5.279	.016 ^b
	Residual	5656.956	17	332.762		
	Total	9170.200	19			

a. Dependent Variable: Achievement12

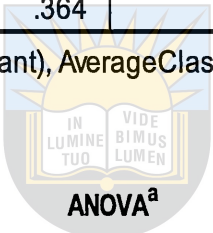
b. Predictors: (Constant), AverageClassSize12, Location

REGRESSION RESULTS FOR 2013

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.603 ^a	.364	.289	23.286

a. Predictors: (Constant), AverageClassSize13, Location



Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5272.373	2	2636.187	4.862	.021 ^b
	Residual	9217.827	17	542.225		
	Total	14490.200	19			

a. Dependent Variable: Achievement13

b. Predictors: (Constant), AverageClassSize13, Location