SCHOOL CULTURE, STRUCTURE AND PRACTICES AS CORRELATES OF STUDENTS' SELF- EFFICACY AND ACHIEVEMENT IN SENIOR SECONDARY SCHOOL MATHEMATICS IN OYO STATE, NIGERIA

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ABSTRACT

Stakeholders in education are concerned about general poor performance in mathematics and the low level of mathematics self- efficacy displayed by students in Oyo state. Studies from some other climes showed that school culture, structure and practices are predictors of achievement and self-efficacy in mathematics. Available studies in Oyo State used self-efficacy to predict achievement in mathematics. There seems to be dearth of study on how school culture, structure and practices predict self-efficacy and achievements in mathematics. This study, therefore, examined the extent to which school culture, structure and practices determined students' self-efficacy and achievement in mathematics in senior secondary schools in Oyo State.

Survey design was used while multistage sampling technique was adopted. Five local government areas (LGA) were randomly selected from Oyo state and the secondary schools in the LGA were stratified into high performing schools (HPS) and low performing schools (LPS). Schools where 40% of the students recorded credit pass in mathematics at the senior secondary certificate examinations in the last five years were classified as HPS, while others were regarded as LPS. From each LGA, 4 schools were randomly selected from each stratum. Also, 30 students and 4 teachers of mathematics were randomly and purposively selected respectively from each school. In all, 40 schools, 1,200 students and 160 teachers participated. Five instruments were validated using 50 students and 30 teachers. They were: the School Culture Scale ($\alpha = 0.81$), School Structure Scale ($\alpha = 0.75$), the School Practices Questionnaire ($\alpha = 0.81$), the Mathematics Self-Efficacy Scale ($\alpha = 0.78$) and the Mathematics Achievement Test ($\alpha = 0.80$). Mean, standard deviation, t-test and multiple regression were used to analyse the data at $p< 0.05$.

One hundred male and 60 female teachers had mean age= ±40.86; SD=9.56, while 500 male and 700 female students had mean age= ±15.56; SD=.92 in the study. Mean scores of HPS and LPS students' achievement in mathematics were ($\bar{x}$=26.78; SD =4.52 and ($\bar{x}$=14.95; SD =3.35) respectively. Self-efficacy and achievement in mathematics of students in HPS were significantly better ($\bar{x}$=134.22; SD =6.02) than those of LPS ($\bar{x}$=19.19; SD =11.65);(t= 18.80, df =158) (achievement) and t= 24.58 (self-efficacy). A significant relationship existed between the school culture, structure and practices, and achievement in mathematics (HPS: R = .389, $F_{(3, 76)}$ = 4.520 and LPS: R= .652, $F_{(3, 76)}$ =18.711) and self-efficacy (LPS: R=.304, $F_{(3, 76)}$ = 7.981) respectively. In HPS, only school structure significantly predicted achievement (β=.435), while in LPS, school culture (β=.471) and school structure (β=.244) significantly predicted achievement. None of culture, structure and practices significantly predicted self-efficacy in HPS, while school culture (β=.330) and school structure (β=.266) significantly predicted self-efficacy in LPS.

Students in high performing schools are efficacious and better academically than those in low performing schools in mathematics. It is only school structure that predicted achievement in high performing schools while school culture and structure predicted achievement in low performing schools. Good school culture, structure and practices should be encouraged in schools.

Keywords: Self-efficacy in mathematics, School management, Low and high performing schools.

Word count: 499

DEDICATION

This work is dedicated to Almighty God-the ALPHA and OMEGA and to my late father S.Ola. Akintola.

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CERTIFICATION

I certify that this study was carried out by Olayemi Oyenike OSHIN the in International Centre for Educational Evaluation, Institute of Education, University of Ibadan, Ibadan, Nigeria

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CHAPTER ONE
INTRODUCTION

1.1 Background to the study

Belief in one's efficacy is a key personal resource to self-development and successful adaptation to change. Self-efficacy operates through its impact on the domains of learning. Efficacy shows whether individuals think optimistically or pessimistically, in self-enhancing or self-debilitating ways. It affects people's goals and aspirations, self-motivation and perseverance. According to Bandura (2001), people ought to believe they can produce desired effects by their actions so that they can persevere in the face of difficulties. He further states that whatever other factors serve as guides and motivators to performance, they are rooted in the core belief that one has the ability to effect changes by one's actions.

Ormrod (2006) refers to self-efficacy as the belief that one is capable of performing tasks in certain ways to attain certain goals. Furthermore, Bandura (2001) affirms that self-efficacy is one's belief in one's ability to succeed in specific situations. Self-efficacy is a construct that deals with one's perception that one is capable of doing what is necessary to reach set goals in terms of knowing what to do and being emotionally capable of doing it (Pajares & Schunk, 2001). Self-efficacy shapes people's expectations, whether or not they expect their efforts to produce favourable outcomes or adverse ones. It also determines how environmental opportunities and impediments are viewed.

People of low self- efficacy are easily convinced of the futility of their effort in the face of difficulties and quickly give up trying while those of high self-efficacy view impediments as surmountable by self-development and perseverance, and they stay on course in the face of difficulties and remain resilient to adversity. Self-efficacy affects the quality of emotional life and the level of vulnerability to stress and depression. Lastly, it determines the choices people make at important decisional points (Pajares, 2002). Marshall (2005) believes that self-efficacy will be enhanced if learning experiences ascend in difficulty and sequence. They further state that if students collaborate and they are given opportunities to participate in small group activities, it will also boost their self-efficacy. Short and Greer (2002) opine that if teachers are provided with professional development, their self-efficacy increases. According to Bandura (2001), self-efficacy in human behaviour

can be made by exploring these four sources: mastery experience, vicarious experience, social persuasions, and physiological states.

Mastery Experience is the interpreted result of purposive performance. As students perceive their progress in acquiring skills and gaining knowledge, their academic efficacy for further learning is enhanced. Simply put, individuals gauge the effects of their actions, and their interpretations of these effects help create self-efficacy. Success raises self-efficacy while failure lowers it. For instance, students who perform well in Mathematics tests and earn high grades in Mathematics classes are likely to develop a strong sense of confidence in their Mathematics capabilities. This strong sense of self-efficacy helps ensure that such students enroll in subsequent Mathematics related classes, approach Mathematics tasks with serenity, and increase their efforts when a difficulty arises. On the other hand, low test results and poor grades generally weaken students' confidence in their capabilities. As a result, students with low Mathematics test result will more likely avoid future Mathematics classes and tasks, and they may approach the area of Mathematics with apprehension thus lowering their self-efficacy.

Another source of self-efficacy is the vicarious experience of the effects produced by the actions of others. Most achievements (school grades) are judged relatively, and one's own capability is inferred by comparing one's attainment to those of one's peers. Again, individuals may infer their self- efficacy by observing the successes and failures of others. Thus, the successes of others raise one's own efficacy, whereas their failures lower it. Schunk and Pajares, (2004) assert that the effects of role models are particularly relevant in this context. A significant role model in one's life can help instill self-beliefs that will influence the course and direction that life will take. Students are likely to develop the belief: "I can do that" when a highly regarded teacher models excellence in an academic activity.

Individuals also create and develop self-efficacy as a result of the social messages they receive from others. Schunk and Pajares, (2004) corroborate that teachers' social interaction increases self-efficacy. They also, ascertain that social persuasions can involve exposure and this can play an important part in the development of an individual's self-beliefs. Most adults can recall something that was said to or done for them during their childhood that has had a profound effect on their confidence in their lifetime.

Physiological states such as anxiety, stress, arousal, fatigue and mood swings provide information about self-efficacy, while self-efficacy in turn, also powerfully influences the physiological states. Schunk and Pajares, (2004) assert that people live within psychic environments that are primarily of their own making. Individuals have the capability to alter their own thinking. It is often said that people can "read" themselves, and so this reading comes to be a realisation of the thoughts and emotional states that individuals have themselves created. Often, they can gauge their confidence by the emotions they experience as they contemplate an action. People with high self-efficacy set higher goals, invests more efforts, show more resilience and persist longer than those with low self-efficacy

In view of the foregoing, it can be deduced that academic self-efficacy involves judgments of one's capabilities to perform tasks in specific academic domains. Therefore, academic efficacy refers to personal judgments of one's capabilities to organise and execute courses of action to attain designated types of educational performance (Pajares, 2002). Accordingly, within a classroom learning environment, measures of academic self-efficacy must be adopted to assess students' perception of their competence to do specific activities. However, most academic self-efficacy researches focus on specific areas of the school curriculum and factors that could enhance students' academic achievement. For instance, Adeoye and Emeke (2010) carried out a study which investigated emotional intelligence and self-efficacy as determinants of academic achievement in English while Pajares, (2002) investigated academic efficacy at Mathematics-related tasks. Furthermore, other research studies have provided consistent and convincing evidence that academic efficacy is positively related to academic performance (Odedele, 2000), academic motivation (Margolis & MacCabe, 2006), persistence (Matsushima & Shiomi, 2003), but other variables such as school culture, structure and school practices that could likely boost students' self-efficacy and aid achievement were rarely researched.

The acquisition of at least basic mathematical skills commonly referred to as numeracy is vital to life opportunities and achievements of individual citizens. Smith (2006) explains that problems with basic skills have a continuing adverse effect on people's lives and that problem with numeracy lead to the greatest disadvantages for the individual in the labour market in terms of general social exclusion. Oshin (2011) opines that Mathematics develop and support children's thinking, reasoning and problem-solving skills. The skills embedded in mathematics and the discipline of learning and using mathematics provides children with

other cognitive skills that they can use across and beyond the school curriculum. Mathematics forms the basis of most scientific and industrial research and development. Increasingly, many complex systems and structures in the modern world can only be understood using mathematics, and much of the design and control of high-technology systems depends on mathematical inputs and outputs. Ilori (2004) asserts that the importance of Mathematics has long been recognised all over the world and that is why all students are made to study Mathematics at the primary and secondary school levels, whether they have the aptitude for it or not. Despite the importance of Mathematics, the performance of students in the subject remains unremarkable as revealed in the analysis obtained from West Africa Senior School Certificate Examination (WASSCE) shown in Table 1.

Table 1: Statistics of WASSCE Mathematics Results (2000-2010)

Year of Examination	Total number of candidates	% of Total number of candidates	Total number of candidates with Credits pass and above	% of Total number of candidates with credits pass and above	Total number of candidates who had between D7 and F9	% of number of candidates with D7-F9
2000	634604	100	208244	32.83	426360	67.17
2001	1023102	100	373955	36.55	649147	63.44
2002	908235	100	309409	34.06	598826	65.94
2003	926212	100	341928	36.91	584284	63.09
2004	832689	100	287484	34.53	545205	65.47
2005	730379	100	282394	38.66	447985	61.34
2006	1149277	97.16*	472674	41.12	644151	56.04
2007	1249028	97.71*	584024	46.75	917868	50.96
2008	1268213	98.35*	726398	57.28	520884	41.07
2009	1348528	96.01*	634382	47.04	660373	48.97
2010	1351557	94.63*	560974	41.50	717869	53.12

Source: West African Examinations Council (2011).

* Indicates percentage of candidates who participated in the examinations.

Table 1 reveals the achievement in Mathematics in West African Senior School Certificate Examination (WASSCE) May/June 2000-2010. As seen on the Table, only in year 2008 was there more than 50% credit pass and above recorded in the examinations. Even though there was improvement in candidates' performance from year 2006 to year 2008, it is not encouraging, especially for a subject which determines the future of the students. This corroborates the findings of Musa (2010) who contends that the performance of students in Mathematics has been observed to be below standard and has not experienced tremendous changes.

According to Dike (2007), poor performance of students in Mathematics could be attributed to several factors. For example, the research carried out by WAEC revealed that students performed poorly due to lack of adequate preparation, shortage of qualified teachers, inadequate teaching aids, lack of good school environment and infrastructural facilities. Others include inability to understand questions that demand high level of thinking, flagrant breach of rubrics, resulting in students answering more questions than required, shallow and poor answers to questions due to poor command of English. Abadom (2002) notes that when the foundation built in mathematics at the primary and junior secondary school is not sound, there will be difficulty in understanding some critical problems in senior secondary schools which automatically leads to failure in examination in secondary schools.

Kilian (2000) in his study on how students' perceptions of the school culture affect students' achievement revealed that school culture is one of the determinants of achievement. Maslowski (2001); Hoy, Tarter and Hoy (2006) corroborate the finding that the culture of a school affects achievement. Likewise, studies on school effectiveness have identified a number of important factors under the school structure that can affect student achievement (e.g. e-lead organization, 2012; Haycock, 2005; Georgia Department of Education, 2006a and Darling-Hammond, 2002). Similarly, school practices was identified by e-lead organisation (2012); Flowers and Mertens (2003) and Bear (2008) as one of the important factors to reckon with in effective schools in other to improve student achievement.

School culture reflects the values, beliefs, norms, traditions, and rituals that build up over time as people in a school work together (Peterson, 2002). Culture evolves in the confrontation between the staff members and organisational realities like structure, policies,

tasks, goals, leadership, resources, workload, technology, and staff characteristics. The people in an organisation are the exponents of the organisational culture. School culture can affect the way teachers relate with each other, with students, parents, administrators, and the community (Ekvall & Ryhammar, 1999). Butler and Dickson (2002) explain that mentors help their protégés by encouraging them to understand how school culture can influence and affect them. School culture can affect how problems are solved, the ways new ideas are implemented and how people will work together. Mitchell (2008) identifies three types of school cultures which are located on a continuum, ranging from bureaucratic, toxic to collegial culture. According to him, in bureaucratic culture, the school administrator is at the helm of affairs while teachers are followers of the dictating regime. There are laid down rules and regulations that must be strictly followed, as strong emphasis is laid on following official rules which may seem unnecessary.

Toxic culture is culture that value tradition and it is evident in a negative setting where dissatisfaction is highly palpable. It engenders feelings of hostility and hopelessness, the focus is on failure of programmes and new ideas. Energy is spent on maintaining the negative values causing high levels of stress for those unfortunate enough to be part of that culture. Toxic cultures value traditionalism, teachers fear being different and those who suggest new ideas are often criticized (Sookradge, 2010).

Collegial school culture is referred to as positive school culture and is characterised by: Collegiality, Experimentation, High expectations, Trust and confidence, Tangible support, Reaching out to the knowledge bases (i.e. "going to the source of information"), developing information networks rather than trying to solve problems in isolation, appreciation and recognition, care, celebration and humor, involvement in decision making, protection of what is important, traditions (i.e. the rituals, ceremonies and symbols that strengthen the school), honest and open communication (Peterson, 2002). Collegial cultures engender a sense of cohesiveness and collaboration. Teachers are encouraged to grow. Community is treasured and sharing of resources and ideas is a common thing. Teachers simply cannot work in isolation to improve student achievement and meet the demands of high stakes accountability. Student achievement increases when teachers work together in teams (DuFour, Eaker & DuFour, 2005).

Collegial culture also value involvement of parents, teachers, administrators, and even students in problem solving, which is considered, not as an individual challenge but a

social challenge. Literature reveals six elements of positive school culture which include Collaborative leadership, Teacher collaboration, Professional development, collegial support, Unity of purpose, and learning partnership (Georgia Department of Education, 2006a). "In a collegial school culture, a team of highly skilled individuals comprises the teaching staff, working continuously with their colleagues to improve their teaching strategies and better manage their classrooms" (Blankstein, 2004, p.130). Collaboration is the thread woven through all six school culture elements.

DuFour et al. (2005) define collaboration as 'a process in which teams worked together interdependently in order to impact their classroom practice in ways that would lead to better results for their students, for their team and for their school. This study focused on the six elements of a positive school culture (collegial culture) which are:

- Collaborative Leadership.
- Teacher Collaboration.
- Professional Development.
- Collegial Support.
- Unity of Purpose.
- Learning Partnership.

Collaborative leadership stresses the importance of the shared decision making process. Teacher collaboration is a process by which teachers work together interdependently in order to impact their classroom practice in ways that would lead to better results for their students. Constructive dialogue, hard work, and determination that no child will slip through the cracks are elements of teacher collaboration (Reeves, 2004).

Professional development provides opportunities for teachers and communities to learn and discuss best practices (DuFour et al., 2005), Unity of purpose requires the efforts of the stakeholders coming together to work towards achieving the common vision and mission of the school (Brown, 2005). Collegial support encourages colleagues to share their personal professional development experiences (Brosnan, 2003), while learning partnership is the bond the school has with the community and the sharing of the same high expectations for students' achievement (Lamb, 2007 & Glickman, 2002).

School leaders should understand the concept of collaboration within each of the six school culture elements and the importance of focusing on fostering an overall collaborative school culture. Positive school culture may lead to a better learning environment for students

thereby enhancing achievement (Craig, Butler, Cairo, Wood, Gilchrist & Holloway 2005). As evidenced in Marcoulides, Heck, and Papanastasiou's (2005) study on how students' perceptions of the school culture affects students' achievement, the results indicated that achievement scores can be explained by students' perceptions of the school culture. Mitchell (2008) in his study used the School Culture Survey and students' achievement on Criterion Referenced Competency test. The analysis of the survey results revealed that a moderately strong correlation exists between the six elements and students' achievement, but this correlation was found not to be statistically significant.

Other studies in their review of the literature on effective schools found a close correlation between positive school culture and academic quality. The literature indicates that a student's chance of success in learning cognitive skills is heavily influenced by the culture of the school (Marcoulides, Heck, and Papanastasious, 2005). Apart from the school culture, other factors within the school that may affect achievement and influence academic self-efficacy are the school structure and practices.

School structure includes plans that focus on the operations of a school towards ensuring the attainment of high standards of learning for all students. A well organised school should not allow anything to hinder the organisational processes. These are, size, course offerings, class formation procedures, grouping practices, resource allocations (teacher course assignment, funding particular programmes), its academic focus (e.g., curriculum alignment and delivery, expectations of students, educational experiences, monitoring student progress) and social integration (e.g., how students interact with peers, teachers) (Auerbach, 2002). He explains that the effectiveness of a school depends largely on the talents and commitment of teachers, students, families and community members. Apart from competent individuals, a well-organised school should have a school structure that reflects the following elements; equitable environment, shared vision, mission and belief, autonomy and a personalised environment.

Darling-Hammond (2002) also corroborates the fact that exemplary schools create school structures and ways of operating that best fit their own students, teachers and communities as they seek to develop high quality and engaging learning environment for their students. Elements that best support such environment are organisation of schooling, school based decision making, implementing continuum classes, monitoring students' progress and extracurricular activities.

Studies on school effectiveness have identified a number of important factors under school structure that can affect students' achievement (e.g. e-lead organisation, 2012; Haycock (2005); Lee & Croninger, 1994; Mortimore, 1991, 1993 & Rice, 2003). These factors include physical environment, class formation procedures, teacher course assignment, funding particular programme, curriculum alignment and delivery, expectations of students, educational experiences and monitoring of students' progress. From their findings, decisions on how schools are organised and operate, how resources are allocated, how classrooms are formed, and how students are taught, all have impact on student learning.

The study therefore focused on the following elements of school structure derived from literature;

- Conducive-Environment. .
- A Personalised Environment
- School Based Decision Making.
- Monitoring Student Progress.
- Implementing Continuum Classes
- Extra-curricular Activities

In this study, School Structure refers to the school plan that includes all the six elements mentioned above that focus the attention of the school on attainment of standards. Aside from the school culture and structure, school practices also may be one of the variables that may influence academic self-efficacy and achievement.

School Practices are the events employed by school administrators to improve students' learning. It can also be said to be factors or attributes that enable students to learn successfully. Auerbach (2002) explains that in organisational sectors, with the exception of the military, and in national cultures other than that of the Netherlands, Canada, Hong Kong and the United States, there is a compelling evidence of a common core of practices that any successful leader calls on, as needed. Three sets of practices that make up this basic core of successful leadership practices according to him are: setting directions, developing people and redesigning the organisation.

Flowers and Mertens (2003) in their report indicated that factors like discipline, challenging curriculum, tracking and teaching performance depend on the organisational practices and can influence students' success. Also, in a research carried out by e-lead

organisation (2012), it was posited that some elements of school practices that go hand-in-hand with high level of students' performance which can be shaped by good policy and effective leadership are allocation of time and space, feedback and reinforcement. Bear (2008) adds that fair, firm, and timely discipline is one of the important factors to reckon with in effective school practices in other to improve students' achievement.

This work therefore focused on five (5) elements of school practices extracted from literature which are;

- Developing People.
- Discipline.
- Allocation of time and space.
- Feedback and reinforcement.
- Redesigning the organisation.

. The performance of Nigerian students in Mathematics has not experienced any tremendous change recently. Meehan and Cowley (2003) in their study of low-performing schools, high-performing schools and high-performing learning communities in United States identified schools as being high-performing and low-performing on the basis of students' academic performance. High performing schools scored higher than schools identified as being low-performing on the basis of students' academic performance. Also, experience has shown that high-performing secondary schools maintain a high turnout rate in Mathematics while low-performing schools' performance seems to be consistently low. Students from consistently high performing schools are proven to be self- efficacious and most parents prefer sending their wards to such seemingly high performing schools because their students' results are always impressive. Could this be as a result of their school culture, structure and practices? Literature reveals several variables that may influence achievement and academic self-efficacy in which school culture, structure and practices which are the variables of concern in this work may have significant role to play.

From the foregoing, it can be observed that school culture, structure and practices are important variables that may affect students' academic self-efficacy and achievement. Yet, there is a dearth of studies in this area, particularly in Nigeria. It therefore becomes imperative to find out if, school culture, structure and practices have any effect on students' academic self-efficacy and their level of achievement in Mathematics.

1.2 Statement of the problem

Many prospective students of higher institutions are often not admitted because they have not obtained a minimum of a credit pass in Mathematics at the school certificate level. In the alternative, instead of being admitted to study their preferred courses, they are compelled to opt for courses which they were not originally interested in. A critical analysis of candidates' results in Mathematics in the various senior secondary certificate examinations also buttresses a below average performance over the years. However, experience shows that the performance of candidates in Mathematics from certain schools is consistently high, while in others, it is consistently low. Furthermore, observation has also shown that quite a lot of parents prefer sending their wards to the seemingly high performing schools because their students appear to have proven to be self-efficacious in the subject.

Literature reveals that several factors determine students' achievement, among these are: school quality, teacher quality, teaching methodology, school environment, etc. Nevertheless, there appears to be a dearth of literature on factors that can influence self-efficacy and on school culture, structure and practices with respect to their combined effects on self-efficacy and achievements in Mathematics. Therefore, this study investigated the extent to which the culture, structure and practices of schools determine students' Mathematics self-efficacy and achievement in Mathematics.

1.3 Research questions

Four research questions were answered in the course of the study.

1. Is there any difference between students' (i) self-efficacy and (ii) achievement of high and low performing schools in Mathematics?
2. Does the obtained regression equation resulting from a set of three predictor variables (school culture, structure and practices) allow reliable prediction of students'
   (i) Achievement in Mathematics?
   (ii) Mathematics self-efficacy in high and low performing schools?
3. Which of the three predictor variables is most influential in predicting students':
   (i) Achievement in Mathematics?
   (ii) Mathematics self-efficacy in high and low performing schools?

4. Are there any of these predictor variables not contributing significantly to the prediction model?

1.4 Scope of the study

The study covered all senior secondary school teachers of Mathematics and senior secondary school II students in Oyo State. The survey research focused on the following variables: Predictor (independent) Variables (school Culture, Structure and Practices) and Dependent (Mathematics Self-Efficacy and Achievement in Mathematics).

1.5 Significance of the study

The result of the study could be useful to all stakeholders since it will enhance the efficiency and effectiveness of leaders, especially school administrators, and enable them to see the necessary things needed and required in the school setting. It adds to research literature and underscores the importance of creating and sustaining a positive school Culture and better Structure and Practices by principals, in a climate of high stake accountability.

It could enable teachers to assist their students to develop high academic self-efficacy, since the result of the study may serve as an eye opener for teachers to see and acknowledge the importance of school culture, structure and practices. It may also be of great benefit to the students since it will enhance and improve their general performance, most especially in Mathematics. Seminars/workshop may be organised to achieve this.

It may help all stakeholders to fashion ways of engendering harmonious relationship among students, teachers, principals and the community. The importance of organising workshops, talks, seminar and conferences so as to create an enabling social and academic environment that is conducive for learning was revealed to the principals, teachers and students, so that they can jointly improve the degree of attainment of learning outcomes.

1.6 Definition of terms

1.6.1 Operational definition of terms

Mathematics Self-Efficacy: refers to the level of confidence the students have in their ability to succeed in any Mathematics related courses, as measured by Mathematics Self-Efficacy Scale.

School culture (Collegial): refers to the values, beliefs, norms, traditions, and rituals that build up over time as people in a school work together to improve students' performance. These are measured using the following indicators (a) Collaborative Leadership, (b) Teacher Collaboration, (c) Professional Development, (d) Collegial support, (e) Unity of Purpose and (f) Learning Partnership as measured by school culture scale.

Collaborative leadership: Collaborative leadership is the degree to which school leaders value teachers' ideas, seek input, engage staff in decision-making, and trust the professional judgment of staff as measured by the school culture scale.

Teacher collaboration: Describes the degree to which teachers engage in constructive dialogue that furthers the educational vision of the school as measured by the school culture scale.

Collegial support: Collegial support is the degree to which teachers work together effectively, trust one another, value one another's ideas as well as assist one another as they work towards accomplishing the tasks of the school organisation as measured by the school culture scale.

Professional development: It is the degree that teacher's value continuous personal development and school-wide improvement as measured by the school culture scale.

Unity of purpose: It is the degree to which teachers work toward a common mission for the school as measured by the school culture scale.

Learning partnership: It is the degree to which teachers, parents, and students work together for the success of the student as measured by the school culture scale.

School structure: These are plans that focus on the operations of a school in ensuring attainment of high standards and high level of learning for all students, as measured by the following elements on school structure scale: Conducive Environment, Personalised Environment, School Based Decision Making, Monitoring Student Progress, implementing continuum classes, and Extra-Curricular activities.

School practices: These are events employed by school leaders to improve students' learning, as measured by the school practices scale, focusing on the following elements:

- Developing People.
- Firm, fair and timely discipline.
- Allocation of time and space.
- Feedback and reinforcement.

- Redesigning the organisation.

High and low performing schools: Schools with ≥40% of students having credit pass in the West African Senior School Certificate Examination (WASSCE) in the past five years were classified as high performing schools, while schools with less than 40% of their students having credit pass in the past five years were classified as low performing schools.

Achievement in mathematics: This is the score obtained in mathematics achievement test used in this study.

CHAPTER TWO

LITERATURE REVIEW

2.0. Introduction

The Study reviewed relevant literature under the following headings:

2.1 Theoretical Framework

2.2 School Culture

2.3 Elements of Positive School Culture.

2.4 School Culture and Achievements in Mathematics.

2.5 Importance of Self Efficacy

2.6 Importance of Mathematics

2.7 School Structure and Achievement in Mathematics

2.8 Elements of School Practices

2.9 School Culture, Structure, Practices and Other Factors influencing self-efficacy

2.10 School Practices and Achievement in Mathematics

2.11 Appraisal of literature and gaps to be filled

2.1 Theoretical Background

Social cognitive theory is the overarching theoretical background of the self-efficacy construct (Bandura, 2001). Within this perspective, one's behaviour is constantly under reciprocal influence from cognitive (and other personal factors such as motivation) and environmental influences. Bandura calls this a three-way interaction of behaviour, cognitive factors and environmental situations termed the "triadic reciprocality". Applied to an instructional design perspective, students' academic performances (behavioural factors) are influenced by how learners themselves are affected (cognitive factors) by instructional strategies (environmental factors), which in turn builds on itself in cyclical fashion. The methods for changing students' perception of efficacy are categorically subsumed under four sources of efficacy information that interact with human nature: (1) enactive attainment (mastery experience), (2) vicarious experience, (3) persuasory (social message) information, and (4) physiological state.

Performance component of self-efficacy is people's judgments of their capabilities to organise and execute courses of action required to attain designated types of performances.

It is not concerned with the strategies one has but with judgments of what one can do with whatever strategies one possesses. According to Bandura (2001) and Schunk and Pajares, (2004) , students feel self-efficacious when they are able to picture themselves succeeding in challenging situations, which in turn determines their level of effort towards the task. Bandura (2001) asserts that self-perception of efficacy highly influences whether or not students believe they have the coping strategies to successfully deal with challenging situations. Self-efficacy may also determine whether learners choose to engage themselves in a given activity and may determine the amount of effort learners invest in a given academic task, provided the source and requisite task is perceived as challenging.

Schunk (2002) submits that several researchers have investigated the relationship of self-efficacy to learning and academic achievement. One challenge therefore, is to investigate new methods of raising learners' level of self-efficacy and academic achievement of which environmental factors (school culture, structure and practices) is one of the triadic factors that can influence achievement (behaviour) and academic efficacy (action). This study considers how environmental factors (school culture, structure and practices) affect learners' actions (academic self-efficacy) which in turn, influence learners' behaviour (achievement) reaction.

2.2 School culture

Hoy and Miskel (2008) assert that the culture of a school may roughly be conceived as the personality of a school - that is, personality is to the individual as culture is to the organisation. Literatures also submit that the construct "culture" does not refer to a phenomenon in the objective world; it refers instead to the perceptions of members of the organisation concerning the organisation's internal environment (Ekvall & Ryhammar, 1999; Rafferty, 2003; Lunenburg & Ornstein, 2004). According to Ekvall and Ryhammar (1999), culture evolves in the confrontation between the staff members and organisational realities like structure, policies, tasks, goals, strategies, leadership, resources, workload, technology, and staff characteristics. The people in the organisation are wearers and exponents of the culture. Similarly, in reference to schools, Hoy and Miskel (2008) opine that culture is a function of the everyday collective perceptions of all participants - administrators, teachers, students, and other stakeholders.

The culture of an organisation is generally conceived as being multidimensional; that is, culture is seen as the product of interactions among classes of internal characteristics. For example, Owens (2004) maintains that four clusters of factors contribute to organisational climate: ecological factors, milieu factors, social system/organisational factors, and cultural factors.

Many authorities also posit that the culture of an organisation influences how the members of that organisation conduct organisational processes, such as problem solving, decision making, planning, communicating, coordinating and controlling, psychological processes of learning, identification, motivating, and so on. As a result, the culture of a school affects students' achievement (Maslowski, 2001; Hoy, Tarter & Hoy, 2006). According to Eckvall and Ryhammer (1999), school culture can affect the way teachers relate with one another, students, parents, administrators, and the community. School cultures are thought to be located on a continuum, ranging from bureaucratic to collegial culture (Butler & Dickson, 2002).

In a Bureaucratic Culture, the administrator is at the helm; teachers are followers of the dictated regimen with strong emphasis on standardization. In other words, Teachers work in isolation with little chance for interaction with peers while policies are mandated from above with little or no input from teachers. Hoy and Miskel (2008) explain that bureaucratic cultures are also known as standard or tradition that leaves many teachers feeling isolated and devalued. There is little incentive to grow, and growth can be seen as threatening to others. Turf-guarding is common. Bureaucratic cultures also encourage individual teachers to solve the problem which they see as a student's problem in their own classroom. Administrators and parents are only called in when the teacher cannot resolve the problem alone in the classroom.

Collegial school culture is referred to as positive school culture and is characterized with: collegiality, experimentation, high expectations, trust and confidence, tangible support, reaching out to the knowledge bases (i.e. "going to the source of information", developing information networks rather than trying to solve problems in isolation or assuming one person has all the answers), appreciation and recognition, care, celebration and humor, involvement in decision making, protection of what's important (i.e. not "throwing the baby out with the bathwater"), traditions (i.e. the rituals, ceremonies and symbols that strengthen the school culture), honest, open communication (Peterson (2002). Collegial cultures

engender a sense of cohesiveness and collaboration. Teachers are encouraged to grow. Community is treasured, and sharing of resources and ideas is commonplace. Collegial cultures also value involvement of parents, teachers, administrators, and even students in solving problems, which is seen, not as a social but an individual challenge.

Butler and Dickson (2002), explain that Toxic cultures engender feelings of hostility and hopelessness with the focus on failure of students, programmes, new ideas. Energy is spent on maintaining the negative values causing high levels of stress for those unfortunate enough to be part of that culture. Sookradge (2010) affirms that toxic culture is like millstones around the necks of afflicted schools as they negotiate the demand of their mandates. Such cultures value conformity. Teachers in the system like doing things the way others are doing it for fear of being different. Teachers who suggest new ideas are often criticised. New teachers who demonstrate willingness to try new things and who look at things positively are resocialised to conform to the negative thought patterns in the school. Hence, there is little cooperation.

Hoy, Tarter and Hoy (2006) assert that the characteristics of the toxic school culture include students being viewed as the problem rather than as valued clients, the belief that teachers are doing the best they can and not searching out new ideas, frequently sharing stories and historical perspectives about the school which are often negative, discouraging, and demoralising, staff of the culture complain, criticise and distrust any new ideas, approaches, or suggestions for improvement raised by planning committees. Members of the school community rarely share ideas, materials, or solutions to classroom problems and have few ceremonies or school traditions that celebrate what is good and raises their hope about their place of work.

2.3 Elements of a positive school culture

The six elements of a positive school culture are collaborative leadership, teacher collaboration, professional development, collegial support, unity of purpose, and learning partnership. Collaborative leadership describes the degree to which school leaders establish and maintain cordial relationship with school staff (Gruenert, 1998). Under this type of leadership, principals empower teachers to become leaders and are also responsible for sustaining the cohesiveness of the stakeholders. This makes the community and staff members feel that they are part of the system. Failing to establish opportunities for teachers

to be leaders can create an empty professional relationship between teachers and school leaders (Marshall, 2005). The principal delegating authority is a key element in fostering collaborative leadership.

Empowerment is the process that encourages teachers to help the school achieve its primary goal of improving the work teachers give to students (Short & Greer, 2002). Having parents, teachers, and students as part of the decision-making process is new to some principals, but vital to the success of implementing a school's mission statement (Short & Greer, 2002). Schlechty (2005) noted that, "The important thing a teacher does is to lead, meaning to inform, inspire, direct, encourage, and nurture" (p. 106).

Empowerment includes, but is not limited to, making information available. It also encourages autonomy and participation, redesigning work, fostering teams, promoting egalitarianism, and giving meaning to work (Bolman & Deal, 2003). Teachers can be further empowered by increasing their autonomy and obtaining support from the principal for their efforts (Bass, 1990). Principals can also encourage innovation and risk taking by teachers. "Risks can be taken, and mistakes can be tolerated" (Bass, p. 90). Innovation and risk taking are essential components for continuous improvement.

School leaders act as members of teams rather than sole decision makers. Principals must believe that through participation in decision-making, teachers will be more committed to the results of such decision-making process and better decisions will be made (Leithwood & Riehl, 2003). Principals create environments that provide teachers with enabling experiences that lead to empowerment. "In schools, enabling experiences may focus on roles and responsibilities, the culture of the school, the way problems are identified and solved, or the structure of the organisation" (Short & Greer, 2002).

Participating in the shared decision-making process is an example of empowerment. Principals create a culture where teachers participate in decisions involving budgets, teacher selection, scheduling, and curriculum. A school culture that encourages teachers to participate in decision making fosters honest and open communication and risk taking (Short & Greer, 2002). Several researchers have purported that the principal could hamper the ability of teachers to lead by not sharing authority (Scribner, Hager & Warne, 2002; Smylie, Conley & Marks, 2002; Somech, 2002), and the decision-making process by not seeking opinions of the teachers but rather making decisions alone (Short & Greer, 2002).

Teacher collaboration describes the degree to which teachers engage in constructive dialogue that furthers the educational vision of the school (Gruenert, 1998). "Collaboration is not natural or common in the traditional school environment" (Blankstein, 2004). Principals must make a deliberate effort in establishing a collegial school culture. They must also define what effective collaboration looks like. Collaboration can easily become an empty gesture if there is no commitment to working together among stakeholders to address common concerns. Constructive dialogue, hard work, and determination that no child will slip through the cracks are elements of teacher collaboration (Reeves, 2004). Providing time for teachers to plan learning activities that have meaning and add value to students is essential for fostering teacher collaboration and increasing student achievement (DuFour, 2004).

A positive school culture consistently provides support to enhance the academic achievement of all learners in a diverse student population (Georgia Department of Education, 2006a). Isolationism cuts the lifeline of useful information (Schmoker, 2004). Teachers working in isolation do not promote the sharing of resources and dissemination of information between teachers. Teachers, who engage in the process of questioning and investigating teaching and learning with their peers, gradually revise their beliefs to incorporate new practices in their classrooms (Fullan, 2000).

The role of the principal is to make informational resources available to teachers, providing them with opportunities for in-depth conversations about teaching and schooling, supporting well organised programmes for professional development, and introducing new ideas for the school to consider (Leithwood & Riehl, 2003). When administrators designate time during the school day for faculty members to study together, teachers can make a positive change. Effective teams also make data-driven decisions (DuFour et al., 2004).

Professional learning communities (PLC's) depend upon teachers collaboratively engaging in discussions about their current teaching practices (DuFour et al., 2005). Developing and implementing PLCs entails a shift in thinking from ensuring teachers are teaching students to ensuring the students are actually learning. Faculties that work together can set clear goals for teaching and learning in order to develop action plans to increase students' achievement and establish a learning community (Dearman & Alber, 2005). According to DuFour et al., (2005), schools which make deliberate efforts to work collaboratively to improve students' achievement must answer the following three

questions: What do we want each student to learn? How do we know when each student has learnt it? How do we respond when a student experiences difficulty in learning?

In order to establish a professional learning community, teachers must be willing to work together to analyse and improve their classroom practice. Teachers meeting regularly have the opportunity to engage in dialogue about teaching practices that promote deep team teaching. DuFour, DuFour, Eaker, and Karhanek (2004) assert that deep team learning leads to higher levels of student achievement. Schools that value surface level learning and teach to the test in response to high-stakes testing measures lack professional learning communities.

Professional development describes the degree to which teachers value continuous personal development and school-wide improvement (Gruenert, 1998). A positive school culture ensures that the climate, culture, and practices of the school continually reinforce and support the professional growth of all adults and include effective and varied professional development opportunities. All staff is committed to collaboration and shared inquiry and decision making that promote continuous professional growth to ensure student achievement and organisational productivity (Georgia Department of Education, 2006a). Schools, unlike most major businesses, spend relatively little on training and development (Schlechty, 2005). Teachers do not look favourably on mandatory in-service training and principals often state that a lack of time prevents the implementation of staff development programmes (Schlechty, 2005).

With traditional staff development, classroom application of innovative strategies is minimal because teachers do not have adequate time to study together (Dearman & Alber, 2005). The goal of professional development in schools must be to improve results in terms of student learning, and not simply to enhance practice. Facilitating student growth and development is the ultimate purpose of professional development (Gordon, 2004). Effective professional development depends upon strong leadership and support, collegiality and collaboration, data-based development, programme integration, a developmental perspective, relevant learning activities, and professional development as a way of life within the culture of the school (Gordon, 2004).

Professional development fosters collegiality and professional dialogue, helps teachers develop a common educational purpose and facilitate collaborative planning, experimentation and critique of teacher practice (Gordon, 2004). These skills are necessary

for creating and sustaining a positive school culture. Great opportunities for professional development remain under the school roof and the principal can be a powerful force in assisting teacher growth. Professional growth refers to teachers' perceptions that the principal provides them with opportunities to grow and develop professionally, learn continuously, and expand their own skills (Short & Greer, 2002). Supporting teachers instructionally, particularly during the implementation of a new programme, is the heart of leadership and fostering a positive school culture (McEwan, 2003). For students to learn, teachers must learn.

Collegial support describes the degree to which teachers work together effectively in order to achieve the school objectives. Teachers should trust each other, value one another's ideas, and assist one another as they work to accomplish the tasks of the school (Gruenert, 1998). Collegial support encourages colleagues to share their personal, professional and development experiences. Collegial support also provides opportunities for teachers to review the knowledge base of specific professional development experiences and allows them to practice the desired behaviours of implementing strategies learnt through professional learning experiences (Walsh and Sattes, 2005).

Barth (2001) said, "I wonder how many children in life might be saved if we educators disclose what we know to each other" (p. 60). A positive school culture consistently supports and enhances the social growth and development of all learners, ensuring the learners acquire the ability to interact positively and effectively with diverse peers and adults within the school and in the world beyond the school environment (Georgia Department of Education, 2006b). Teachers can easily continue to work in relative isolation with only limited support from colleagues if the principal does not create and sustain a positive school culture and opportunities for collegiality (Collins, 2004).

However, in a culture of high-stakes accountability, no teacher acting alone can improve students' achievement for the entire school. Haycock (2005) reported that if teachers who work alone made all instructional decisions, then inferior practices would dominate in most schools. To cope with the challenges of high-stakes testing and accountability, teachers need to work together to thoughtfully review student work. The review process needs to lead teachers to modifying research based instructional strategies to improve students' achievement (Dearman & Alber, 2005). Educators' dialogue and problem solving skills are essential in building capacity to improve students' achievement (Fullan,

2000). Collegial support and technical support from technology specialists and persons with special enterprise in curriculum design and assessment are required to create and sustain the positive school culture necessary to improve students' achievement school wide (Schlechty, 2002). Lifelong learning is a contributing factor to the level of collegiality in a school.

Unity of purpose is the degree to which teachers work towards a common mission for the school (Almedia, 2003). A mission statement provides the stakeholders with a clear understanding of the school's purpose and existence (Blankstein, 2004). Three critical questions form the foundation of a mission statement. First, what do we expect students to learn? Second, how will we know students are learning? Third, what will we do when students do not learn? (DuFour, 2002). Teachers understand, support, and perform in accordance with that mission (Gruenert, 1998). To choose a direction, a leader must firstly, have developed a mental image of a possible and desirable future state of the school or organisation. Leaders must be able to engage stakeholders through the creation of a shared vision (Bennis, 2003). Transformational leaders set the vision and project the vision in a way as to empower others to take responsibility in achieving it (Short & Greer, 2002).

Planning and organisation are vital to any organisation. Planning and organisation are the processes, procedures, structures, and products that focus the operations of a school in ensuring attainment of standards and high levels of learning for all students (Georgia Department of Education, 2006b). An operational school that exemplifies successful planning and organisation has a written school vision and mission that are reflective of the district's vision and mission. The school's vision presents a picture of the desired future and ways stakeholders would like the school to be different in the future. Altering negative beliefs and values can transform a school (Richardson, 2004). Mission and purpose give members guidance toward the organisational goals on a daily basis (Bolman & Deal, 2003). Compelling beliefs and vision give focus and direction, desired results are clear, and everyone knows that decisions are in accordance with the beliefs, vision, and results to be achieved (Schlechty, 2003).

The principal and school administrators foster the development of the vision of the school and articulate the vision as spokespersons for the school. The school's mission represents a written synthesis of (a) what the purpose of the organisation is, (b) who are the individuals and groups responsible for achieving the school's goals, and (c) who are the clients for whom the school functions as a unique learning organisation. The mission also

communicates the academic direction of the school and the responsibility of the school to its students. In a positive school culture, the mission is understood, believed, and practiced by staff and other stakeholders (Georgia Department of Education, 2006b). The vision and mission synthesize the focus of the entire school and reflect consensus and understanding among all administrators, faculty, staff, parents, community, and students. The vision and mission in successful schools consistently guide and inform the continuous improvement process (Georgia Department of Education, 2006a). Vision is a central component of leadership. Clarity and direction are essential in the goal-setting process. Setting organisational and personal goals provide the foundation for motivation and inspiration. Effective schools have a culture characterised by well-defined goals that all stakeholders value (Brown, 2005).

The principal has a critical role in communicating goals that define the school in terms of academic achievement. Transformational leadership encompasses key concepts such as vision, mission, and goal setting. Transformational leaders are change agents. Bass (1990) identified four dimensions of transformational leadership: charismatic leadership, inspirational leadership, intellectual stimulation, and individualized consideration. Charismatic leaders have extraordinary influence over their followers. Words such as vision, communication, symbols, and charisma describe the charismatic leadership style. Followers describe charismatic leaders as those who make everyone enthusiastic about assignments. Inspirational leaders are goal oriented.

The vision and shared focus stress student achievement as the priority. The vision is articulated clearly in the district's focused strategic direction and actions for student achievement (Campbell & Fullan, 2006). Principals are responsible for the development and realisation of the vision for student achievement along with stakeholders. In positive school cultures, the school staff shares a commitment to the realization of vision for student achievement. The coherence between the district's vision, school plans, and classroom plans reflects the commitment to the vision. Learning partnership is the degree to which teachers, parents, and students work together for the common good of the student. The common good of the student includes good academic performance and his/her overall well-being. Positive school cultures foster respect, best effort, honesty, good judgment, and kindness from all the stakeholders (Lickona, 2004).

Parents and teachers share common expectations and communicate regularly about students' performance. Parents trust teachers, and students generally accept responsibility for their schooling (Gruenert, 1998). Most parents know their children better than their teachers know them (Schlechty, 2003). Parents are a valuable source of information for teachers. Teachers do not always exploit this source of information for the best interest of the student. Instead of asking the parents about their children, teachers may attempt to tell the parents about their children. By allowing parents give information about their children, teachers will gain valuable information about the most effective methods to adopt in engaging the children in school work that has meaning and value (Schlechty, 2003)

The overall condition of the physical plant within the school environment thoroughly enhances the school as a learning community and positively affects students and staff's perception of the learning environment as safe and orderly (Georgia Department of Education, 2006b). A safe and orderly school fosters a positive school culture. An inviting physical plant will attract the community to participate in students' learning.

2.4 School culture and achievement

Schools are organisations with very specific cultures. School culture is the historically transmitted patterns of meaning that include the norms, values, beliefs, ceremonies, rituals, traditions, and myths understood by the school's stakeholders (Short & Greer, 2002). The school culture reflects norms, values, standards, and practices that reinforce the academic, social, emotional, and relational growth of each student and a commitment to the professional growth of all educators (Georgia Department of Education, 2006a).

Literature on school culture makes it clear that effective schools, that is, schools that demonstrate high standards of academic achievement have a culture characterised by a well-defined set of goals that all members of the school (administration, faculty, and student) value and promote (Flowers & Mertens, 2003). If a principal can establish and clearly communicate goals that define the expectations of the school with regards to academic achievement, and if the principal can rally the constituency of teachers and students to support those goals, then the motivation to achieve the goals is likely to follow. Principals simply must assess school culture and be willing to shape a positive culture within schools in order to improve students' achievement (George, Ronald & Constantinos,

2005). Principals can do little to affect students' achievement directly. Consequently, an effective culture is the primary tool with which a leader fosters change (Marzano, Waters, & McNulty, 2005). A healthy school culture fosters continuous improvement in student achievement (Clark & Clark, 2003).

Most reviews of the effective school literature leads to the consensus that the school culture and climate are central to academic success (Mackenzie, 1983). Typical of the findings is the summary of Brown (2005), who in their review of the literature on effective schools found a close correlation between positive school culture and academic quality: The literature indicates that a student's chance for success in learning cognitive skills is heavily influenced by the culture of the school. Others works show that a relationship exists between school culture and student achievement (Almedia, 2003; Blankstein, 2004; Collins, 2004; Clark & Clark, 2003; Gruenert, 1998; Smith, 2006; Zmuda, 2004).

In line with the above, Mitchell (2008) carried out a survey of teachers in 15 participating schools. The study used the School Culture Survey and the Criterion Referenced Competency Test to measure students' achievement. The analysis of the survey results revealed that the student achievement data were correlated with six elements of a positive school culture including collaborative leadership, teacher collaboration, professional development, unity of purpose, collegial support, and learning partnership. The study revealed that a moderately strong correlation exists between the six elements and students' achievement, this correlation was however not found to be statistically significant.

Literature reveals that, apart from school culture, other causes of poor performance can be attributed to the government not creating an enabling environment for effective teaching and learning to take place through the provision of necessary infrastructure, facilities and qualified manpower. In Nigeria poor performance at the WASSCE by students is also linked to factors such as lack of equipped laboratories, libraries, chalk, dusters, as well as population explosion in schools. It is observed that only schools with the physical indicators in place record high quality academic achievement by their students. The parents also are to blame for not providing conducive study atmosphere for their wards at home, as some of them would rather spend on frivolous things like parties rather than paying school fees and buying educational materials.

Teachers are central to the performance of students in Mathematics, but lack of competent, adequately motivated and committed Mathematics teachers in schools has

resulted in not using the necessary skills/methods required to impact the required knowledge in order to ensure that learning takes place. Often times, teachers are poorly motivated and their salaries very ridiculous.

In all of these, Habour- Peters (2000) identified the following as distinct causes of poor performance in Mathematics:

i. Improper preparation of students for examination by the Mathematics teachers.
ii. Teacher including many difficult questions in the examination.
iii. Ambiguity of instruction as regards the questions.
iv. Lack of self –confidence by students.
v. Poor management of the Mathematics examination by supervisors and/or invigilators.
vi. Over- crowding of the examination hall.
vii. Creating a conducive atmosphere for cheating both in and out of the examination hall.
viii. Nervousness brought about by Mathematics being thought of as an abstract subject or the examination being seen as a threat.
ix. An attempt to assist a friend.
x. Encouragement to cheat by parents and guardians.
xi. Forcing students to offer Mathematics as a subject or as a course even when they (students) lack the requisite skills to make the minimum requirement for the subject/ course.
xii. The policy of getting a minimum qualification for a course in Mathematics even when the student lacks the requisite skills to make the minimum requirement for the course.
xiii. The urge to pass Mathematics examination at the Senior Secondary Certificate Examination (SSCE) and/or Joint Matriculation Examination (JME) by all means for obvious reasons.
xiv. Abetting of Mathematics examination malpractices by Mathematics examination agents.
xv. Poor handling of Mathematics examination materials by the appropriate custodians.
xvi. Lack of prestigious alternatives to professional courses causing stiff competition for the limited chances in the educational establishment.

xvii. The nature of the Nigerian society, so-called "Nigerian Factor" which is the embodiment of corruption in its entire ramification, and has eaten deep into the fabric of the society.

xviii. The absence of good guidance counselors in schools to give special guidance and counseling to students who offer Mathematics.

xix. The improper implementation of the National Policy on Education.

Student population explosion is a major contributory factor to poor performance in Mathematics. Though this is not peculiar to Mathematics, the effect is felt more on the subject. Looking back in time, one could say that while there has been an increase in school enrolment over the past few decades, students' performance has been on the decline. For instance, Primary School enrolment was 3 million in 1960 while it rose to 18 million in 1984. Enrolment in Secondary School was 135.4 thousand in 1960 and 2.2 million in 1984. The University enrolment in 1960 was 2,545 while in 1984 it was 108,720 (Ale, 2000). Increase in enrolment however, has not been associated with high performance but has led to a serious decline in the standard and level of student achievement, especially as there is no commensurate increase in facilities and manpower.

Government's policy on free education and automatic promotion in government schools in some parts of Nigeria does not help the situation either. This, coupled with the struggle for the limited space at the higher level of education has not only led to serious decline in the quality of competitive examinations, but has also promoted examination malpractices among students, out of desperation to pass examinations. In addition to students' background and contextual influences, researchers have identified certain factors in secondary schools that can influence students' achievement. These factors are the school culture, structural and organisational processes (e.g., size, course offerings, and class formation procedures, grouping practices), resource allocations (teacher course assignment, funding of particular programs), its academic focus (e.g., curriculum alignment and delivery, expectation of students, educational experiences, monitoring students' progress) and social integration (e.g., how students interact with peers, teachers). How well the school staffs are able to organise and coordinate school work shapes not only the learning experiences and achievements of students, but also the environment in which school work is carried out (Harris, 2003).

2.5 Importance of self-efficacy

Self-efficacy beliefs influence motivational and self-regulatory processes in several ways. They influence the choices people make and the courses of action they pursue. Most people engage in tasks in which they feel competent and confident and avoid those in which they do not. William James wrote that experience is essentially what individuals choose to attend to. If this is the case, then the self-beliefs that influence those choices are instrumental in defining one's experience and providing an avenue through which individuals exercise control over the events that affect their lives. Beliefs of personal competence also help determine how much effort people will expend on an activity, how long they will persevere when confronting obstacles, and how resilient they will be in the face of challenges. The higher the sense of efficacy, the greater the effort, persistence, and resilience. Efficacy beliefs also influence the amount of stress and anxiety individuals experience as they engage in a task and the level of accomplishment they realise.

Strong self-efficacy beliefs enhance human accomplishment and personal well-being in many ways. People with a strong sense of personal competence in a domain approach difficult tasks in that domain as challenges to be mastered rather than as dangers to be avoided. They have greater intrinsic interest in activities, set challenging goals and maintain a strong commitment to them, heighten their efforts in the face of failure, recover their confidence more easily after failure or setback, and attribute failure to insufficient effort or deficient knowledge and skills which they believe themselves capable of acquiring. High self-efficacy also helps create feelings of serenity in approaching difficult tasks and activities. Conversely, people with low self-efficacy may believe that things are tougher than they really are - a belief that fosters stress, depression, and a narrow vision of how best to solve a problem. It can therefore be deduced that self-efficacy beliefs are strong determinants and predictors of the level of accomplishment that individuals finally attain. For these reasons, Bandura (1986) has made the strong claim that beliefs of personal efficacy constitute the key factor of human agency.

2.6 Importance of mathematics

Mathematics can be defined as the study of patterns and relationships, a way of thinking, seeing and organising the world, a language, a tool, a form of art, and finally as power and a social filter. Steen (1988) defines Mathematics as the study of quantity,

structure, space, and change. Pragati (2010) opines that Mathematicians seek out patterns, formulate new conjectures, and establish truth by rigorous deduction from appropriately chosen axioms and definitions.

According to Oshin (2011), Mathematics develops and supports children's thinking, reasoning and problem-solving skills. The skills embedded in mathematics and the discipline of learning and using mathematics provides children with other cognitive skills that they can use across and beyond the school curriculum. Mathematics as a subject is vital to understanding many other subjects. A good understanding and knowledge of mathematics is an essential tool in many other fields, including natural science, engineering, medicine, and the social sciences. Applied Mathematics is the branch of Mathematics concerned with application of mathematical knowledge to other fields. It inspires and makes use of new mathematical discoveries and sometimes leads to the development of entirely new mathematical disciplines. In fact, Pragati (2010) identifies disciplines where the role of Mathematics is widely accepted. The disciplines are: Physical Sciences and Fluid Dynamics, chemistry, biological science etc.

Physical sciences and fluid dynamics: In mathematical physics, some basic axioms about mass, momentum, energy, force, temperature, heat etc. are abstracted, from observations and physical experiments and then the techniques of abstraction, generalization and logical deductions are used. Fluid dynamics which involves understanding the conditions that result in avalanches, and developing ways to predict when they might occur, uses an aspect of Mathematics called fluid mechanics. Civil and mechanical engineers still base their models on this work, and numerical analysis is one of their basic tools.

Chemistry: Mathematics is extremely important in physical chemistry, especially in advanced topics such as quantum or statistical mechanics. Quantum chemistry relies heavily on group theory and linear algebra and requires knowledge of mathematical/physical topics such as Hilbert spaces and Hamiltonian operators.

Biological Sciences: Bio Mathematics is a rich fertile field with open, challenging and fascinating problems in the areas of mathematical genetics, mathematical ecology, mathematical neuron- physiology, development of computer software for special biological and medical problems, mathematical theory of epidemics, use of mathematical programming and reliability theory in biosciences as well as mathematical problems in biomechanics, bioengineering and bioelectronics.

Social sciences: Disciplines such as economics, sociology, psychology, and linguistics all now make extensive use of mathematical models, using the tools of calculus, probability, game theory and network theory, often mixed with a healthy dose of computing.

Economics: In economic theory and econometrics, a great deal of mathematical work is being done all over the world. The tools of matrices, probability and statistics are used. A great deal of mathematical thinking goes in the task of national economic planning, and a number of mathematical models for planning have been developed.

Actuarial Science, Insurance and Finance: Actuaries use Mathematics and statistics to make financial sense of the future. For example, if an organisation is embarking on a large project, an actuary may analyse the project, assess the financial risks involved, model the future financial outcomes and advise the organization on the decisions to be made. Much of their work on pensions involves ensuring funds stay solvent long into the future, when current workers have retired. They also work in insurance, setting premiums to match liabilities. Mathematics is also relevant in many other financial issues, ranging from banking and trading on the stock market to producing economic forecasts and making government policy.

Psychology and archaeology: Mathematics is very necessary in many of the social sciences, including psychology and archaeology. Archaeologists use a variety of mathematical and statistical techniques to present the data from archaeological surveys and to distinguish patterns in their results to shed light on past human behavior.

Social networks: Graph theory, text analysis, multidimensional scaling and cluster analysis, and a variety of special models are some mathematical techniques used in analysing data on a variety of social networks.

Political science: In Political Science, mathematics is used to analyse past election results to see changes in voting patterns and the influence of various factors on voting behavior and switching of votes among political parties and mathematical models for Conflict Resolution. The Game Theory is usually adopted for this purpose.

Music: Calculations are the root of all sorts of advancement in different disciplines. The rhythm that we find in all music notes is the result of innumerable permutations and combinations of SAPTSWAR.

Art: Mathematics and art are two different languages that can be used to express the same ideas. It is considered that the universe is written in the language of Mathematics, and its characters are triangles, circles, and other geometric figures.

Management: Different Mathematical models are used to discuss management problems of hospitals, public health issues, pollution, educational planning, administration and other similar problems of social orientation. In order to apply Mathematics to management, one must know the mathematical techniques and the conditions under which these techniques are applicable.

Engineering and Technology: Mathematics has played an important role in the development of mechanical, civil, aeronautical and chemical engineering through its contributions to mechanics of rigid bodies, hydro-dynamics, aero-dynamics, heat transfer, lubrication, turbulence, elasticity, etc. It has become of great interest to electrical engineers through its applications to information theory, cybernetics, analysis and synthesis of networks, automatic control systems and design of digital computers etc.

Technology: An important area of application of Mathematics is in the development of formal mathematical theories related to the development of computer science. Today, most applications of Mathematics to science and technology are via computers. The foundation of computer science is based on Mathematics only.

2.7 School structure and achievement

Studies on school effectiveness have identified a number of important factors that can affect students' achievement (e.g. Haycock (2005) & Rice, 2003). In addition to students' background and contextual influences, researchers have identified certain factors in secondary schools that can influence students' learning opportunities. These factors refer to the school's structural and organisational processes (e.g., size, course offerings, and class formation procedures, grouping practices), resource allocations (teacher course assignment, funding of particular programs), its academic focus (e.g., curriculum alignment and delivery, expectations of students, educational experiences, monitoring student progress) and social integration (e.g., how students interact with peers, teachers). Decisions on how schools are organised and operate, how resources are allocated, how classrooms are formed, and how students are taught, all have impact on student learning. How well the school staffs are able to organise and coordinate school work shapes not only the learning experiences and

achievements of students, but also the environment in which this work is carried out (Harris, 2003).

From the foregoing, school structure can be said to be the plans put in place by the school in order to attain its (school) objectives. Researches have shown that certain elements of school structure and process go hand-in-hand with a high level of students' performance. The core elements which can be used by good policy and effective leadership identified in this study are: (1) Conducive Environment. (2) Personalised Environment. (3) School Based Decision Making. (4) Monitoring Student's Progress. (5) Implementing Continuum Classes and (6) Extracurricular Activities.

Conducive environment: A conducive learning environment refers to the mood and atmosphere which motivate students to participate actively in learning and to be engaged in school activities. Bandura (2001) observes that one's self-efficacy may increase or decrease depending on the learning environment. Also, the location of a school has a significant effect on the behaviour of the child (Adeyemi, 2012). According to him, pupils tend to be confident and perform better in educationally stimulating environments which are likely to arouse a child's higher degree of interest and at the same time increase their self-efficacy

From literature, physical factors in the learning environment that may affect students' achievement and boost their self-efficacy are; Lighting, Temperature, Sound, Ambience/Air quality, Physical Space and layout, Seats, tables and Colour. Lighting can affect people's moods and behavior. There has been some interesting research on how light affects behavior and learning. The evidence from the research has caused many schools to upgrade the quality of their lighting in recent years. Jensen (2000) described some research on the influences lighting on learning. Wagner (2004) also investigated whether lighting type influences learning in the classrooms of three elementary schools. Results showed that fluorescent lighting raises the cortisol level in the blood, and is also likely to suppress the immune system. Children in the vitalite rooms were therefore in a "healthier' learning environment and their performance were better than those that were not in vitalite rooms.

Demand media (2012) presented the Harmon study on 160,000 school aged children in the USA which determined the environmental factors that influenced learning. By the time they left primary education at ages 11-12, over 50% had developed deficiencies related to classroom lighting. To test the hypothesis, changes were made to the lighting in their learning environment and the same students were studied 6 months later. From the result,

visual problems were reduced by 65%, fatigue was reduced by 55%, infections decreased by 43%, and posture problems were reduced by 25%. Overall the children showed a dramatic improvement in their academic achievements.

The results from a wider range of research show that; strong, natural lighting produces effective learning. Fluorescent lighting causes fidgeting and restless learners. Softer lighting can have a calming effect on learners and thereby lead to improvement in their performance.

Sound: Research evidence shows that music activates the whole brain, making us feel more energetic, responsive and ready to learn. Music raises performance level and masks other disruptive sounds. Mozart and some baroque music recorded at 60 beats per minutes have been proven to increase length of study times, learning and retention of languages and grades. Some learners prefer total silence or minimum sound because sound acts as a distraction to effective learning. Educators need to provide alternative spaces to suit different learners or as the learning topic or situation merits. Libraries usually provide alternatives such as silent study areas and controlled speech zones where there is already noise from human traffic service provision. Sound levels should be managed in learning environments to suit the purpose of the session.

Temperature: There is much research evidence of the impact of heat on behaviour and learning. Heat stress lowers scores on both the intellectual tasks of reasoning, thinking and decision making; and lowers achievement on the physical tasks involving accuracy, dexterity and speed. The brain functions better at lower temperatures rather than when overheated. Temperature influences our moods and clothing and room optimum temperature should range from 20-22 centigrade.

Space and layout of the room: To have a conducive learning environment, maintaining a neat and orderly classroom is advisable. Messy desks and poorly maintained classroom are deterrents of a conducive learning atmosphere. To ensure that the learning environment is conducive at all times, teachers should assign a time when students must rearrange their desks and clean their environment, making the classroom walls and the windows clutter free. How the physical space of the learning environment is used can be an important influence on learning. Most of us would have had an experience where we were expected to concentrate and take notes in a lesson held in an unsuitable environment; hanging on high

stools in a science laboratory or trying to take notes in a laboratory with very little space to write. The physical space needs to be used effectively, desk and lockers should be well arranged and enough space should be between the lockers.

The size of the room is also important; too much space can cause embarrassment in classrooms as front rows are left empty while students cluster on seats at the back of the room. Overcrowding of the classrooms can trigger behavioural problems as individuals try to claim the available space in a small room for learning activities. The entrance into the room needs to be spacious to enable students enter quickly and find seats or workspace that will allow learning with a minimum of disruption from other students. Access to windows and heat controls should be made easy to ensure adequate temperature and ventilation. However, this should be managed by members of staff rather than pupils and students.

Seating and tables: There may be some limits such as the type of furniture available in teaching rooms and libraries, but the seating arrangement in the classroom is within the control of the class teacher. The Style and how comfortable the furniture is also have impact on learning. For instance, the furniture could be built to accommodate the use of computers large viewing screens or writing desks. The learners need to feel comfortable in the environment so they can concentrate on the content and purpose of the teaching.

Suitability for classroom session: Is the furniture fixed or moveable to allow flexibility in arrangement for different activities e.g. group work? Changing seating arrangement during a break can revive a session or change the mood and energy level of the learners. How the furniture is arranged can have impact on individual students' learning. Some learners who prefer informal arrangements have been found to achieve higher marks when allowed to arrange the seating position to suit their preferences or to choose where to sit in the classroom. Formal rows of seating can generate a better attitude to the session than casual seating. In some situations, tables can be barriers to discussion and group work and in others, they provide comfort and stability to the learning environment, offering students some 'territory' within which they can work.

Information communication technology (ICT): This is needed for instructional delivery in order to accomplish many objectives and improve the quality of teaching in every subject area (Oshin and Badmus, 2012). It affects almost every aspect of our daily lives. ICT leads all processes based on information, therefore there is need for every student in the country to be computer literate and be technology competent. Thus, all schools have to be equipped

with the necessary ICT tools and resources and also build the capacity of both staff and pupils/students to acquire the necessary skills for accessing and using such tools. Teachers' capacity must be enhanced continuosly and technology use must match the curriculum's philosophy and theory of learning. In addition, adequate number of computers must be conveniently located within the classroom. It must also be noted that the mere provision of hardware and software, as well as training on how to use them is not enough; this must be supported with follow-up and peer tutoring so as to ensure maximum utilisation of information technology potentials and opportunities. Research shows that most teachers do not make use of the potentials of ICT to contribute to the quality of learning environment, although they value this potential quite significantly. The benefits of ICT will be gained when confident teachers are willing to explore new opportunities for changing their classroom practices by using ICT".

Learning styles: These have also been found to influence students' preferences for choice and location of their study space. Which is the best place for the teacher to be while teaching? In some sessions it might be necessary for them to be at the front of the class, but this could also imply a position of power/authority over the students. This position however, could be used to control their behaviour through rough eye contact and body language. At times, there are situations in computer laboratories where the trainer moves behind the students who face machines spread around the perimeter of the room. It can be difficult to deliver a session in this type of environment but swivel chairs would enable students to change their direction to face the teacher whenever necessary.

Ease of movement: Can the trainer move between the students easily and can students move around if they needed to? This is especially important in a long session where short breaks or changes in activities are needed. Think about how bags and other belongings are stored during the session. One designated space on tables at the side of the room can be safer than items spread randomly along the floor or in the aisles.

Colour: There is considerable evidence of the psychological effects of colour on anxiety levels, pulse, blood flow and level of arousal. Every colour has a wave length. Every wavelength affects our bodies and brain differently according to our personality and state of mind. Retail psychology used this evidence to shape our behaviour and encourage us to spend money. Generally, bright colours such as red, orange and yellow stimulate energy, creativity, aggression and nervous behaviours. Red is seen as disturbing if we are anxious

but exciting if we are feeling calm. It is commonly used in fast food outlets to encourage customers to eat and leave as quickly as possible.

Colours blue and green are calming; they increase the feeling of well-being and relaxation. There is also some evidence to show that they raise our immune systems and influence healing. Research evidence indicates the high tendency to trust organisations that use colours blue or green in their logo and premises. Dark colours, such as brown lower stress, increase relaxation and feelings of security. Light colours are best for learning environment as they stimulate positive feelings; yellow, beige, and white are the most effective. Colour can be used in handout/posters/power point presentations and mind maps to improve impact/memory and enhance recall for learner.

Personalised environment: A personalised learning environment is characterised by the ability of students and adults in the school to develop meaningful, sustained connections to one another. In a personalised learning environment, students are treated as individuals; they are given responsibility, spoken to honestly, and treated with dignity and respect. Through these connections teachers get to know students well; they become familiar with students' learning styles, interests, backgrounds, and goals. Knowing who their students are and how they learn, teachers can adjust instruction to leverage students' strengths and build curriculum around issues relevant to their lives. The personal connection between teachers and students also allows teachers to push students further. Teachers can demand higher levels of achievement because their expectations are based on a personal understanding of students' capabilities. Because of their sustained, mutual trust, students grant teachers the authority to challenge them as learners. It is not a gainsay that teachers who establish personal, close, friendly, warmth and supportive relationships with their students create an enabling environment for learners to learn in a relaxed and tension free atmosphere which may likely have effect on the students' self-efficacy. It is evident that when students experience a sense of belonging at school as well as supportive relationships with teachers and classmates, they are motivated to participate actively and appropriately during the teaching/learning process, as well as in other activities in the classroom and the school (Hess & Finn, 2004).

In a study carried out on effective schools, students credited their academic achievements to their supportive relationships with teachers. With reduced enrolments and lower daily student loads, teachers in schools have greater opportunities to establish and

sustain relationships with students and their families. Families appreciate the chance to contact and be contacted by teachers who know their children well. The result is a caring network of adults invested in the success of each student.

Monitoring student's progress:

The use of common assessments by teachers is essential in determining how best to meet students' academic needs. "Both effective assessment procedures and effective use of the associated data are fundamental to a school's continuing achievement and improvement" (Blankstein, 2004, p. 142). Creating a culture of trust is essential in sharing data to make continuous improvements. "As trust among teachers grows and meeting protocols are well established, data revealing distinctions between results of various teachers' classrooms can be shared" (Blankstein, p. 145).

In successful schools, all stake holders share a vision, mission and set of values. When these three elements are held securely in common, everyone in the school community knows why their work is important, what the school wants to accomplish and how their belief in what is possible translates into their day-to-day actions and interactions with one another. Schools devote considerable time and energy towards ensuring that all stakeholders are personally committed to the school and see their ideas and priorities reflect this commitment. The school management ensures that all activities in the school are properly monitored to ensure attainment of standards, especially students' assessment.

According to Onuka (2010a), assessment is a systematic, comprehensive, and guidance-oriented method of determining the totality of all gains a learner might have gotten in terms of knowledge, attitude and skills, from the course of a given set of learning experiences. He states that the continuous assessment that is effectively conducted could enhance students' performances. For proper monitoring of students' progress, successful schools should note the following;

- Ensure that assessment is diagnostic, systematic, comprehensive cumulative and guidance oriented.
- Ensure that all students' assessments are recorded.
- School should schedule a unified time for test.
- Teachers should be encouraged to conduct tests whenever they deem necessary.

- Schools should determine what constitutes the continuous assessment for uniformity purpose. (i.e. assignment, project, test, classwork and grading of notes .etc.)
- School should organise interclass debate and quiz competition.
- Prizes should be given to the best class weekly/fortnightly/end of the term/session.
- Students' note should be collected randomly for inspection.
- Scheme of work should be checked weekly and compared with the students' note.
- Schools should invite parents of weak students for deliberation.
- Promotion committee should be put in place to maintain equal yardstick for promotion
- Prizes should be given to best students at the end of the term/session
- Schools should encourage students' participation in any academic activity outside the school.

School based decision making

This is the ability to realise the school's vision and implement its mission for student learning without being constrained by external mandates and regulations. The foundation of a school's success is its ability to make autonomous decisions on issues that affect its structure, academic programme and governance. It was observed from literatures that successful schools have control over their budget, curriculum, scheduling, staffing, space and leadership. Gaining these autonomies is often a gradual process, requiring a broad base of support for schools among staff, parents and the community. Establishing autonomy to make decision provides the school the best opportunity to build a unified learning community and use its resources to provide high quality teaching and learning to students.

Schools have the flexibility to alter their instructional programme to meet the challenging needs of individual students. According to Raywid , "the greatest inhibitor to a school's ability to realise its potential is lack of autonomy; constraints imposed by stringent regulations, bureaucratic regularities, and longstanding labor agreements and the need to mesh with policies and practices of the board of education and the school district as well as the hesitation of some education personnel at all levels to make fundamental changes in the way they function." The major challenge, she states, "is obtaining sufficient separateness to permit staff members to generate a distinctive environment and to carry out their own vision of schooling". From researchers' point of view, if schools are given autonomy to take decisions, the following can be done;

- Different committees can be put in place (e.g. exam, promotion, sport, disciplinary e.t.c.)
- Opinion of the committees should be respected and any suggestion given by them should be implemented when properly sieved.
- Student should have input in school decision.
- Parents and other stakeholders should be given opportunity to contribute to the decision making.
- School authorities should not be biased in selection of committee members.

Implementing continuum classes; literature reveals that in successful schools, students are assigned to particular teachers for proper monitoring. Students may remain in the same class with a teacher for some years; also same teacher may teach same set of students a particular subject over years to encourage continuity and proper monitoring of the students. If there is any complex topic and the normal class period is not enough to teach, teachers should be encouraged to organise extra class for the group before/after the school hour. Extension of school period should be encouraged if need be in any successful school to improve students' achievement, most especially in mathematics.

Extra-curricular activities

This is the social character of the school. It creates an alternative context for learning and provides opportunities for students' to be recognised for their unique talents. This also plays a significant role in academic environment.

2.8 Elements of school practices

School Practices are the strategies/tactics employed by school administrators to improve students' learning. It is also the factors or attributes that enable students learn successfully. Auerbach (2002) explains that in organisational sectors other than schools and the military, and in national cultures other than The Netherlands, Canada, Hong Kong and the United States, there is compelling evidence of a common core of practices that any successful leader falls back on when necessary. Parts of the practices that make up this basic core of successful leadership practices according to him are: developing people and redesigning the organisation.

Flowers and Mertens (2003) in their report indicated that factors like discipline, challenging curriculum, tracking and teaching performance depend on the organisational practices and can influence students' success. Also, as revealed in a research carried out by e-lead organisation, some elements of school practices that go hand-in-hand with high level of students' performance which can be shaped by good policy and effective leadership are allocation of time and space, feedback and reinforcement as well as productive use of time.

Bear (2008) added that fair, firm, and timely discipline is one of the important factors to reckon with in effective school practices in order to improve students' achievement. Such practices are sufficient for leaders aiming to significantly improve student learning in their schools and to boost their academic efficacy. Without this factor however, not much improvement will be recorded. The set of practices revealed by literature that make up the basic core of successful leadership practices in this study are: Developing People, Discipline, Allocation of Time and Space, Feedback and Reinforcement as well as Redesigning the Organisation.

Developing People: This involves providing teachers and others in the system with the necessary support and training to succeed. While clear and compelling organisational directions contribute significantly to members' work-related motivations, they are not the only conditions to do so, neither do such directions enhance the capacity of members for maximum productivity. Such capacities and motivations are influenced by the direct experiences organisational members have with those in leadership roles, as well as the organisational context within which people work (Auerbach, 2002). More-specific sets of leadership practices which significantly and positively influence these direct experiences include, offering intellectual stimulation, providing individualised support and appropriate models of best practice and beliefs considered fundamental to the organisation.

Discipline: Students must understand that good behavior is valued in the school, and explicit policies must define what behaviours are not acceptable and the punitive measures for such behaviours. Punishment must be administered consistently with respect to due process to help create and maintain a safe, orderly, and positive learning environment (Bear, 2008) Research supports that an authoritative style of discipline is used not only in the prevention of behavioural problems but also in their correction. Authoritative educators guide rather than control students. They view disciplinary encounters not merely as situations that may require punishment as a means of correction, but as opportunities to

teach appropriate behaviour and help develop self-discipline and prevent future behavioural problems. Similar to their approach towards prevention, authoritative educators combine responsiveness (e.g., demonstrating support and caring; striving to prevent lasting harm to the teacher–student relationship) with demandedness (e.g., remaining firm, communicating clear expectations of appropriate behaviour, imposing fair consequences).

When correcting misbehaviour, effective educators tend to use one of two general types of behavioural techniques: punitive and replacement. Punitive techniques are the various forms of punishment which range from unpleasant verbal reprimands, ‘‘the evil eye’’, proximity control (i.e., standing near the student), and taking away privileges (e.g., recess) to much harsher forms such as suspension, expulsion, removal to an alternative education program, and corporal punishment.

Replacement techniques are strategies intended to achieve the same goals as punitive methods, but focus on teaching or strengthening desired behaviours that might replace the undesired behaviour. Common replacement techniques include direct instruction, positive reinforcement, modeling, social problem solving, conflict resolution, and anger management training.

Effective educators clearly recognise the limitations of punishment: (a) It teaches students what not to do and fails to teach desired behavior; (b) its effects often are short term; (c) it teaches students to be aggressive towards or punish others; (d) it fails to address the multiple factors that punishments typically contribute to a student’s behavior; (e) it is likely to produce undesirable side effects (e.g., anger, retaliation, dislike towards the teacher or school, social withdrawal); (f) it creates a negative classroom and school climate; and (g) it can be reinforcing (i.e., negative reinforcement), such as in time-out and suspension, by allowing students to avoid or escape from situations they find aversive (e.g., academic work, peer rejection, a harsh and uncaring teacher).

In recognition of these limitations, when correcting misbehavior, Senge (2006)) suggest that effective educators should work hard to avoid using punishment. Instead, they should focus on strategies for developing self-discipline and for preventing misbehavior. When correcting misbehavior, they are much more likely to use mild forms of punishment, such as physical proximity, taking away privileges, verbal reprimands, and ‘‘the evil eye’’ than harsh forms of punishment such as suspension. When punishment is used, it is used fairly, judiciously, in the context of a caring and supportive relationship, and praises and rewards are strategically

used to maximize effectiveness in improving behaviour while minimizing the risk of diminishing intrinsic motivation. One key to doing this is by using praise and rewards in an informational rather than controlling manner (Bear, 2008).

Redesigning the organisation: The class teacher together with colleagues can control the content of the curriculum they actually deliver to students (Schmoker, 2004). This type of control ensures that the state-mandated curriculum is the primary focus in the classroom. Teachers simply must know what students are to learn (Marzano, 2003). For the mathematics teacher, having the appropriate mathematics and teaching skills is not enough. A teacher must understand the different approaches to teaching as well as the techniques and teaching strategies associated with them. Teachers need to establish a common, concise set of essential curricular standards and teach them on a generally common schedule (Schmoker, 2006). Teachers can also control the qualities and characteristics of the tasks assigned to students (Schlechty, 2002). The sense of control over the content delivered to the students and the emotional outlets teaming provides for teachers contribute to building positive school practices.

In successful schools, teachers have time to engage in regular and meaningful discussions about their teaching practice. Most middle grade educators and researchers agree that for schools to improve student outcomes, teachers must provide instruction that are engaging and developmentally appropriate for young adolescents. The following may be done when redesigning the organisation:

Ensure quality teaching for all students: If schools are to provide students from diverse backgrounds challenging learning, they need teachers who can deliver differentiated instruction and use a range of teaching strategies that match students' learning styles. Successful/Effective teachers adjust their style of interaction (direct instruction, coaching, supervising) and type of assignments (individual reports, group projects, class-wide debate) based on students' needs and interests. No single instructional approach is a guarantee; teachers who are able to use a broad repertoire of approaches skillfully are most effective in reducing the achievement gap and creating equitable learning opportunities for all students.

In addition, ensuring quality teaching for all students may require strategic redeployment of the teaching staff. Traditionally, a school's most veteran and capable teachers gravitate towards teaching upper-level courses which through tracking; have filtered out students with learning difficulties. These schools have shed the conventional

seniority system based on staff preference and convenience in favour of an approach that is best for students. They also recognise the importance of embedding supports (such as peer tutoring, double class periods, and after school tutoring) to help ensure students' success.

Cohorts; in a cohort approach, smaller groups of students are scheduled together to share a set of classes and teachers. This strategy allows teams of teachers who share the students in common to use a tag-team approach on student support, enrichment, and discipline. Integrated projects are more easily implemented within the cohort, as teachers know that all students in the group share certain classes in common. Cohorts also allow for students to develop positive peer relationships within a safe group of classmates that they see regularly throughout the school period. While the small school movement generally seeks to create schools of 400 students or less, most successful schools limit cohorts within these schools to 60-120 students.

Looping; in this approach, students and teachers are scheduled together for multiple terms or years. Through looping, teachers get to know students and their families over an extended time, allowing them to tailor instruction to match students' strengths and interests. Looping also helps teachers maximize their time in the classroom. Once norms and routines are established, teachers can concentrate on instruction without having to get to know a new group of students every few months.

Advisories; this is another method by which small schools provide student support and enable strong relationships. Advisories consist of 10 to 15 students who meet regularly with a faculty advisor for academic and personal support. Teachers often advise the students they teach in class, which increases their personal bond. In some schools, students stay with the same advisor for several years to build strong relationships over time. Most successful programs schedule advisory groups to meet at least 2-3 times per week.

Students' choice; students are personally connected to school when what they learn reflects their passion in life. Students, who work with teachers to negotiate the curriculum, develop personalised learning plans, scaffold complex tasks, or structure internships are invested in their learning because they can see and explore the relationship between school and achieving their goals for the future. In this kind of setting, the purpose of learning shifts from "getting through the book" to capitalising on students' interests to go deep into

challenging contents. Students are motivated to study, research, question, reflect, write and present ideas when they feel that the content they are learning is personally relevant.

Mentors; mentors are powerful advocates, supports, instructors and role models for students. Mentors could be adults in and outside of school; they could be teachers, administrators, advisors, internship supervisors, community service leaders and members of the community. Mentors play a wide range of roles in students' lives as they instruct, serve on exhibition panels, give advice, counsel, or just listen. In short, mentors are caring adults who help guide students through decisions regarding academics, college, career, personal issues that affect learning or whatever else relates to the students' life and activities in school. In a personalised learning environment, every student has a connection to a mentor who is able to help that student challenge him/herself to achieve to his/her highest potential.

Allocation of time and space: Schools should give priority to core subjects when planning the school time table. This will enable the teachers to cover the curriculum on time and have enough time to revise. Also, time should be allotted to teachers for teaching, planning, coordination, staff development and to discuss student's work and share lesson plans (e-lead, 2012). Schools can also adopt:

Longer blocks of time: Schools can define a schedule with longer blocks of time in the day and week. Such schedules create opportunities for students to spend time learning off campus (for example, taking classes at local colleges, doing internships or service learning projects in the community). When students are learning off-site, teachers have regular opportunities to work together (Linda, 2012).

Varied blocks of time: Another approach to scheduling is to vary the length of days. For example, some schools start late or release students early one day a week. Students' hours can be adjusted over the course of the week to make up for any time lost by these changes to the daily schedule. The schedule can be similarly shifted so that teachers meet on a designated day after school.

Effective strategies: Adequate time is the first essential element. Equally important is ensuring that teachers have training in the strategies and protocols necessary to be effective once they gather to tackle issues of instructional practices. Study groups, action research teams and critical friends' networks are opportunities for learning, problem solving, professional growth and collegial support. However, teachers need professional development to learn how to apply such processes of inquiry.

2.9 School culture, structure and practices and other factors influencing self-efficacy.

It is obvious from all the literature reviewed in this study that there is a dearth of research work on all the independent variables of this study, most especially in relation to school culture, structure, practices and self-efficacy. It is implied from the work of Bandura that most of the elements that constitute the independent variables fall under the sources identified by him, which can be explored in human behaviour. According to Bandura (2001) self-efficacy beliefs in human behaviour can be made by exploring these four sources: mastery experience, vicarious experience, social persuasions, and physiological states

Mastery Experience; this is the interpreted result of purposive performance and it is the most influential source of self-efficacy. Simply put, individuals gauge the effects of their actions, and their interpretations of these effects help create their self-efficacy. Success raises self-efficacy while failure lowers it. Students who perform well in mathematics tests and earn high grades in Mathematics classes are likely to develop a strong sense of confidence in their Mathematics capabilities. This strong sense of efficacy helps ensure that such students enroll in subsequent Mathematics-related classes; they approach mathematics tasks with serenity and increase their efforts when a difficulty arises.

On the other hand, low test scores and poor grades generally weaken students' confidence in their capabilities. As a result, students with low Mathematics test score are more likely to avoid future Mathematics classes and tasks, and they may approach the area of Mathematics with apprehension. Bandura's emphasis is that mastery experiences are the most influential sources of self-efficacy. He posited that to increase students' achievement in school, educational efforts should focus on raising feelings of competence.

Vicarious Experience: The second source of efficacy information is the vicarious experience of the effects produced by the action of others. When people are uncertain about their own abilities or have limited prior experience, they become more sensitive about it. Schunk and Pajares, (2004) asserts that, the effects of models are particularly relevant in this context. A significant model in life can help instill self-beliefs that influence the course and direction that life takes. Students are likely to develop the belief that "I can do it" when a highly regarded teacher models excellence in an academic endeavour/ activity.

Part of one's vicarious experience also involves the social comparisons made with others. This is where peer groups and peer pressure come to play. What peers value, what they consider honorable, and how they behave is of major importance to preteens and teenagers who wish to fit in with the peer reference group. Social comparisons and peer modeling are powerful influences on developing self-perceptions of competence. Interaction effects can complicate evaluation of the relative power of different modes of influence. A model's failure has a more negative effect on the self-efficacy of observers when observers judge themselves as having comparable ability to the model. If, on the other hand, observers judge their capability as superior to the model's capability, failure of the model does not have a negative effect.

Social Persuasions; Individuals also create and develop self-efficacy beliefs as a result of the social messages they receive from others. Pajares and Urdan (2005) ascertain that social persuasions can involve exposure to the verbal judgments of others and is a weaker source of efficacy information than mastery or vicarious experience, but persuaders can play an important role in the development of an individual's self-beliefs. Most adults can recall something that was said to them (or done to/for them) during their childhood that had a profound effect on their confidence for the rest of their lives. Bandura (2001) cautioned that effective persuasions should not be confused with knee-jerk praise or empty inspirational homilies. Successful persuaders cultivate people's beliefs in their capabilities while at the same time ensuring that the envisioned success is attainable.

Just as positive persuasions may work to encourage and empower, negative persuasions may work to defeat and weaken self-beliefs. Being counseled at an early age that one is not "university material" can have a destructive effect on the child who is not endowed with the resilience to withstand and counteract such judgments. It is usually easier to weaken self-efficacy beliefs through negative appraisals than to strengthen such beliefs through positive encouragement.

Physiological States such as anxiety, stress, arousal, fatigue, and mood also provide information about self-efficacy. Individuals have the capability to alter their own thinking and self-efficacy which in turn, influences the physiological state of an individual powerfully. Schunk and Pajares, (2004) stated that Bandura had observed that people live within psychic environments that are primarily of their own making. It is often said that people can "read" themselves, and so this reading becomes a realisation of the thoughts and

emotional states that individuals have, by themselves, created. Oftentimes, they can gauge their confidence by the emotional state they experience as they contemplate an action.

In part, negative physiological states provide cues that something is amiss, even when one is unaware that such is the case. Students who approach public speaking with dread most likely lack confidence in their public speaking skills. Moreover, when people experience aversive thoughts and fears about their capabilities, those negative affective reactions can themselves trigger the stress and agitation that help ensure the inadequate performance they fear. This is not to say that the typical anxiety experienced before an important endeavour is a sign of low self-efficacy. The "butterflies in the stomach" phenomenon is generally quite a normal apprehension that most people experience before important events, especially if they are public events and require performing before others. Strong emotional reaction to a task, however, provides clues about the anticipated success or failure of the outcome. Overly strong arousal can weaken performance. Also, one should not confuse the state of anxiety that may accompany specific performances and activities with the trait, or chronic anxiety that may have its roots in broader and more complex causes.

In view of the foregoing self-efficacy theory, academic self-efficacy involves judgments on capabilities to perform tasks in specific academic domains. Therefore, academic efficacy refers to personal judgments of capabilities to organise and execute courses of action to attain designated types of educational performance (Pajares, 2002). Accordingly, within a classroom learning environment, measures of academic self-efficacy must assess students' perception of their competence to do specific activities. As students perceive their progress in acquiring skills and gaining knowledge, their academic efficacy for further learning is enhanced.

However, most research efforts on academic self-efficacy focus only on specific areas of the school curriculum and factors that could enhance academic achievement. For instance, Adeoye and Emeke (2010) carried out a study which investigated emotional intelligence and self-efficacy as determinants of academic achievement in English, Pajares, (2002) investigated academic efficacy at Mathematics-related tasks, while Ilori (2004)explored the self-efficacy of women in Mathematical, scientific and technological careers. Furthermore, other research studies have provided consistent, with convincing evidence that academic efficacy is positively related to academic performance (Odedele, 2000), academic motivation (Margolis and MacCabe, 2006), persistence (Matsushima & Shiomi, 2003) and

memory performance (Odedele, 2000), but other variables such as school culture, structure and school practices that could likely boost students' self-efficacy and aid achievement were rarely researched.

From the factors identified by researchers, this study attempts to identify specific variable that may increase self-efficacy which, if educators properly access, can help students in the school setting. The variables are the school culture, structure and practices which are part of environmental factors in the social cognitive theory which can boost self-efficacy. Bandura (2001) argues that the beliefs that people have about themselves are key elements in the exercise of control and these self-beliefs influence and are themselves influenced by human behaviour and by environmental contingencies. Bandura (2001) also observe that teaching strategies adopted for teaching in the classroom could and does make a difference in pupils' self-efficacy. It then appears that self-efficacy may increase or decrease depending on the learning environment. The location of a school has a significant effect on the behaviour of the child (Adeyemi, 2012). According to him, pupils tend to be confident and perform better in educationally stimulating environments which are likely to arouse children's interest and at the same time increase their self-efficacy. It is pertinent to note that the location of school plays an influential role in the teaching and learning situation. Studies have shown that there is a large Mathematics achievement gap between rural and urban areas with most rural based schools being characterized by inadequately qualified teachers, lack of/inadequate basic amenities and poor teaching environment, all of which inhibit self-efficacy and good academic performance

(Brown, 2003)

2.10 School practices and achievement

Measuring and evaluating effective school practices can be a challenging and time-consuming task. First, schools use a variety of techniques and activities to create effective practices and measuring all of them might be difficult. Secondly, there are often disparities in the implementation of practices within the same school, thus blurring the overall school outcome because of the varying frequencies at which the practices occur. Lastly, each school may set its own programme and implementation goals given its unique context (e.g., location of time, grade configuration, discipline etc) thereby creating a situation in which no two schools are alike in their priorities or implementation choices.

Some elements of school practices that may affect students' self-efficacy and achievement as revealed by the review of literature in this study if properly implemented are; Developing People, fair, firm and timely discipline, allocation of time and space for learning, feedback and reinforcement as well as redesigning the organisation.

In a study that established a relationship between team work and classroom practices, as assessed by the Center for Prevention Research and Development (CPRD) at the University of Illinois, it was fully recognised that students' scores on standardised achievement tests are the outcomes preferred by district, state, and federal educational policy makers. Although, standardised achievement tests serve a purpose, it was argued that students' assessment should consist of multiple forms of assessment (Kohn, 2000). That being said, the analyses that followed examined the relationship between interdisciplinary team practices, classroom practices, and students' achievement, as measured by standardised test scores. Most middle grade educators and researchers agree that for schools to improve student outcomes, teachers must provide instruction that is engaging and developmentally appropriate for young adolescents (National Forum to Accelerate Middle-Grades Reform, 2002). Accordingly, effective practices are those that (a) maintain high levels of academic rigor, (b) have a curriculum that is meaningful, relevant, and connects subject matter, (c) provide opportunities for active learning, (d) go beyond the boundaries of the team and classroom into the community, and (e) foster a positive climate that stems from mutual respect and beneficial interactions.

2.11 Appraisal of literature and gaps in existing literature

A review of relevant Literature has revealed that decisions on how schools are organised and operate, how resources are allocated, how classrooms are formed, and how students are taught, all have impact on student achievement (Georgia department of education, 2006a; Flower & Mertens, 2003; Schlechty,2002; Habour-peter,2000 & Fullan,2000). Successful educational leaders develop their schools as effective organisations that support and sustain the performance of administrators and teachers, as well as students. Specific practices typically associated with this set of basics include strengthening school cultures, modifying organisational structures and building in best practices. Such practices assume that the purpose behind the redesign of organisational cultures , structures and practices is to facilitate the work of organisational members and that the malleability of the

school culture, structures and practices should match the changing nature of the school's improvement agenda.

From the available literature reviewed, it is obvious that there is a dearth of research on school culture, structure and practices. Also, no known work, especially in Nigeria has been seen to show the relationship between school culture, structure and practices and how these variables influence achievement and self-efficacy in Mathematics. Similarly, researchers assess self-efficacy beliefs by asking individuals to report the level, generality, and strength of their confidence to accomplish a task or succeed in a certain situation. In school settings, students may be asked to rate their confidence to solve Mathematics problems (Pajares,Dorman,Fisher & Waldrip 2002), or engage in self-regulatory strategies (Bandura, 1986). In addition, research has shown a relationship between academic efficacy and achievement (Schunk, 2006 & Pajares, 2002). In nearly all known research on self-efficacy, self-efficacy served as an independent (predictor) variable. In this study however, Mathematics self-efficacy serves as a dependent variable. Other factors apart from what was revealed in literature that may determine academic self-efficacy and achievement in mathematics were revealed by the study, and this are the school culture, structure, and practices.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter focuses on the research methodology which includes the research design, target population, sampling techniques and sample, instrumentation, data collection procedure and data analysis.

3.1 Research Design

This study used a survey design. Survey design, according to Chandler (2003), can be used to investigate problems in realistic settings. It is a systematic empirical inquiry in which the researcher does not have direct control on the independent variables because their manifestations have already occurred.

3.2 Variables in this study

The variables in this study are:

3.2.1 Independent Variables;

(1) School Culture (Collegial Culture):

- Collaborative Leadership
- Teacher Collaboration
- Professional Development
- Collegial Support
- Unity of Purpose
- Learning Partnership

(2) School Structure:

- Conducive Environment
- Personalised Environment
- School Based Decision Making
- Monitoring Student's Progress
- Implementing Continuum Classes
- Extra-curricular activities

(3) School Practices:

- Developing People
- Discipline
- Allocation of Time and Space
- Feedback and Reinforcement
- Redesigning the Organisation

3.2.2 Dependent Variables:

- Mathematics Self- Efficacy
- Achievement in Mathematics

3.2.3 Grouping Variables:

School performance type (high and low performing school in Mathematics)

3.3 Target population

The target population for this study comprised all Senior Secondary School II (SS2) students and their teachers in Oyo state, Nigeria.

3.4 Sampling Technique and Sample

Multistage sampling technique was employed in selecting the sample for this study as follows: Simple random sampling technique was used to select 5 Local Government Areas in Oyo state. The secondary schools in the selected local government areas were stratified into high performing and low performing schools based on their performance in the West Africa Senior Secondary Certificate Examination in the last five years (schools with at least 40% of their students having credit pass and above in WASSCE were categorised as high performing schools while others are categorised as low performing schools).Based on the stratification there were 118 LPS and60 HPS in the LGA selected. From each LGA, 4 schools were randomly selected from each stratum, thus, 8 schools were selected from each LGA. In all twenty (20) schools were selected from each stratum. Hence, forty schools were involved. Simple random sampling was also adopted in selecting thirty (30) SSS II students from each of the forty (40) schools. Altogether one thousand two hundred (1,200) students (500 male and 700 female) were involved in the research.

Purposive sampling method was used to select four (4) teachers of Mathematics from each school. This was done so as to select the teachers that had taught and are teaching the students in the senior secondary classes who are used to the school culture. Thus, a total of one hundred and sixty (160) teachers of Mathematics (100 males and 60 females) were selected for the study.

3.5 Instrumentation

Five instruments were used in the study namely:

- School Culture Scale (SCS)
- School Structure Scale (SSS)
- School Practices Questionnaire (SPQ)
- Mathematics Self- Efficacy Scale (MASES)
- Mathematics Achievement Test (MAT)

3.5.1 School Culture Scale (SCS):

The School Culture Scale was adapted from Mitchell (2008). The questionnaire has two sections, the bio-data section which contained questions about the participants' demographics and the question section which had 35- items. These items allowed teachers to record their perceptions of their school's culture. The instrument has five (5) sub-scales (See Appendix 11), with Likert description questionnaire. The Likert scale ranged from 1 (not at all) to 5 (always).The highest obtainable score on the scale is 175 while the lowest obtainable score is 35. It was pilot-tested on thirty (30) randomly selected secondary school teachers so as to validate it and eliminate difficulties in understanding the questionnaire items. Cronbach alpha was used to determine the reliability coefficient and the value obtained was 0.81. Lawshe method was also used to establish the content validity and the value obtained was .74.

3.5.2. School Structure Scale (SSS)

The Scale was developed by the researcher and tagged School Structure Scale (SSS). The Questionnaire has six (6) subscales (Appendix I) with each scale consisting of a series of teacher survey questions regarding how often the events take place in their schools. The questionnaire (SSS) has two sections, the bio-data section; contains questions about the participants' demographics .i.e. gender, age, total years of teaching experience, years of

work/service at the current school, and location of the school. Section B contains forty-five (45) items on School Structure.

It was pilot-tested on thirty (30) randomly selected secondary school teachers so as to validate it and eliminate difficulties in understanding the questionnaire items. These items allowed teachers to record their perceptions of their schools' structure. Teachers' responses were recorded on a scale that ranged from 1 = rarely, 2 = sometimes, 3 = often, to 4 = very frequently. The least obtainable score on the scale is 45 while the highest obtainable score is 180 (see Appendix 1). The reliability and content validity of the instrument was established using Cronbach alpha and Lawshe method respectively. The reliability coefficient of this instrument was 0.75.

The content validity of the instrument was established using Lawshe formula: CVR = $\frac{Ne - N/2}{N/2}$.

The average value of these coefficients was found and used as the coefficient of the instrument. The content validity coefficient was 0.74.

CVR = Content Validity Ratio

Ne = No of panels rating the item good

N = Total number of panels

3.5.3 School Practices Questionnaire (SPQ):

The Questionnaire was developed by the researcher. It contained twenty nine (29) items. The practices were defined quantitatively as scales or dimensions with each scale consisting of a series of teacher survey questions regarding how often the practices occurred in their schools'. The questionnaire (SPQ) had two sections, the bio-data section which contained questions about the participants' demographics .i.e. gender, age, total years of working-teaching experience, years of work/service at the current school, and location of the school as well as the second section which contained items on school practices.

It was pilot-tested on thirty (30) randomly chosen secondary school teachers so as to eliminate difficulties in understanding the questionnaire items. These items enabled teachers to record their perception of their schools' practices. Teachers' responses were recorded on a scale that ranged from 1 = rarely occurs, 2 = sometimes occurs, 3 = often occurs to 4 = very frequently occurs. Obtainable score on the questionnaire ranges between 29 and 116 (see

Appendix 111).The reliability and content validity of the instrument was established using Cronbach alpha and Lawshe methods respectively. The instrument was validated using 30 teachers from schools similar to that of the sample population and the reliability of the instruments was .81 and the value obtained from Lawshe was .85.

3.5.4 Mathematics Self- Efficacy Scale (MASES)

The Scale (MASES) was developed by the researcher. It has two sections: the bio-data and item section which consisted of 40 items. The response format were 1= not true of me, 2=fairly true of me, 3= true of me, 4= always true of me. The highest obtainable score was 160 while the minimum score on the scale was 40 (see Appendix IV). The instrument was validated using 50 students from schools similar to that of the sample population. Factor analysis was used to determine the internal consistency of the instrument. The reliability and content validity of the instrument was established using Cronbach alpha and Lawshe method respectively. The coefficients obtained were .78 and .82 respectively.

3.5.5 Mathematics Achievement Test (MAT)

The test was constructed by the researcher based on the Senior Secondary II Mathematics Curriculum. The reliability coefficient was determined using Kuder-Richardson 20 (KR-20) while the content validity was ascertained by 10 teachers of Mathematics. MAT was scored using marking scheme containing the keys. The highest possible total score was 40, that is, each item attracted a score of 1 while the minimum score was zero (0). The instrument was validated using 50 senior secondary school II students from schools similar to that of the target sample. The instrument which initially consisted of one hundred (100) items was reduced to forty after the determination of the difficulty and discrimination index of the items. Forty items whose difficulty indices ranged between 0.13 and 0.39 were deleted. For the remaining 40 items, the difficulty indices of each item ranged between 0.40 and 0.70, while the discriminating indices ranged between 0.42 and 0.65.(see Appendix V) The reliability index of MAT was 0.80. This was established by using Kuder Richardson 20 formular.

Table 3.1 is the specification table for the test

Table 3.1 Test Blue Print

Content/Objective	Knowledge (35%)	Comprehension (32.5%)	Application (32.5%)	Total (100%)
Base, Indices and Logarithm (15%)	2(11,18)	2(19,26)	2(29,30)	6
Circles (12.5%)	2(6,13)	1(25)	2(17,33)	5
Lengths, Areas and Volume (15%)	2(14,19)	2(18,24)	2 (21,37)	6
Statistics and probability(12.5%)	2 (1,27)	2 (2,3)	1(10)	5
Sets (7.5%)	1(16)	1(23)	1(40)	3
Linear and Quadratic(15%)	2 (9,12)	2 (9,32)	2 (22,38)	6
Triangles and Polygon (15%)	2(7,5)	2(4, 8)	2(15,20)	6
Ratio,Proportion and Rate(7.5%)	1(31)	1(28)	1(39)	3
Total (100%)	14	13	13	40

3.6 Data collection procedure

The researcher engaged four (4) trained research assistants to assist in carrying out the study data. Letters of introduction were collected from the Institute of Education to the selected schools to seek permission from their Principals before the administration of the instruments and collection of the schools' past WASSCE results. The researcher and the trained research assistants administered the instruments to the students and teachers. Collection of data lasted for eight weeks. Names of schools used in this study are not included to ensure confidentiality

3.7 Data analysis

The data were analysed using t-test, Pearson Product Moment Correlation Coefficients and Multiple Regression Analysis. The illustration of the method of analysis is shown in table 3.2 below.

Table 3.2 Method of analysis by research questions

Research question 1	Mean, standard deviation and t-test
Research questions 2,3 and 4	Multiple Regression

3.8 Methodological Challenges

The major challenge the researcher faced was the initial lack of cooperation by the school principals, teachers and the students out of suspicion. The other challenges encountered during the collection of data and administration of the instruments included the disruption of the school time table and the rigour involved in going through the results of schools for the past five years to ascertain the school performance. To overcome the problems, the researcher established rapport with the schools authority in order to gain their cooperation and support in addition to a letter of introduction from the Institute of Education to assure them of the validity and confidentiality of the research.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

This chapter presents and discusses the results of the study. The study investigated the relationship, effect and differences between school culture, structure and practices and student achievement and self-efficacy in mathematics in high and low performing schools. The results are presented based on the responses to the research questions in chapter one.

4.1 Findings and discussion

4.1.1 Research Question 1: Is there any significant difference between students' (i) self-efficacy and (i) achievement of high and low performing schools in Mathematics?

T-test analysis was conducted to see whether there was any significant difference between students' self-efficacy and achievement of high and low performing schools in mathematics.

Table 4.1 T-test of Achievement in Mathematics and Mathematics Self-efficacy of **High and Low performing Schools**

	School performance type	N	Mean	Std. Deviation	Df	T	Sig
Mathematics achievement	High	80	26.78	4.52			
	Low	80	14.95	3.35	158	18.802	.000
Self-efficacy	High	80	134.22	6.02			
	Low	80	98.19	11.65	158	24.576	.000

Table 4.1 shows that the t-value for achievement in Mathematics (18.802) and Mathematics self-efficacy (24.576) were significant at $p \leq 0.05$ level of significance. This shows that there is difference between Mathematics achievements in high and low performing schools. The difference between high and low performing schools' self-efficacy was also significant.In addition, the difference between the means of high and low performing schools and the 95% confidence interval for the estimated population mean differences gave very large effect sizes (d). Effect size provides us with a measure of the

extent to which two means differ in terms of standard deviations (Brace, Kemp & Snelgar, 2006).According to Cohen in Brace, Kemp and Snelgar (2006), effect size of 0.2 should be regarded as small, 0.5 regarded as medium while 0.8 and above should be regarded as large. Thus:

The effect size (d) = difference in mean ÷ average standard deviation

Achievement in Mathematics (d) =11.83 ÷ 3.935= 3.006

Mathematics self-efficacy (d) = 36.03 ÷ 8.835= 4.08

The results revealed that there was significant difference between achievements of high and low performing schools in mathematics. Similarly, there was a significant difference between high and low performing schools' Mathematics self-efficacy. The difference between the means of high and low performing schools was high; likewise the 95% confidence interval for the estimated population mean differences gives large effect sizes. This indicates a great difference between all the values of dependent variables obtained in high and low performing schools. The findings clearly revealed that the performances of high performing schools are better than those of the low performing schools. Likewise, students of high performing schools are more efficacious than those from low performing schools. These results corroborate those of Aeurbach, (2002), Haycock (2005), Dronkers and Robert, (2008) and Bear, (2008), and also agree with the work of Meeham and Cowley (2003) who found that there were differences between the performance of consistently above and consistently below median schools. It is important to stress that the students who have confidence in their ability to succeed usually take control over their own learning experience and do participate actively in classroom, while those who do not have confidence dodge participation in academic activities. Furthermore, most students' with high self-efficacy are often encouraged by obstacles to put in more effort than before. In essence a student with high level of academic self-efficacy in a particular subject often attributes the failure to external factors, while a person with low self-efficacy will attribute failure to low ability. Personal experience reveals that economically advantaged students are more in high performing schools, that is, apart from availability of all necessary things needed in high performing schools, some of the parents of the students in these schools organise extra-mural classes for their wards at home. This also might have contributed to the brilliant performances of students in high performing schools.

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4.1.2 Research question 2: Does the obtained regression equation resulting from a set of three predictor variables (school culture, structure and practices) allow reliable prediction of students'

(i) Achievement in Mathematics?

(ii) Mathematics self-efficacy in high and low performing schools?

Research Question (2i) A multiple regression test was conducted with the six elements of school culture (Collaborative Leadership, Teacher Collaboration, Professional Development, Unity of Purpose, Collegial Support and Learning Partnership) and students' achievement in Mathematics

The correlation coefficient measures the strength of a linear relationship between two variables (Creswell, 2004). The correlation coefficient is always between -1 and +1. A good prediction can result between one variable and the other when correlations fall between the range of .66 and .85. Correlations in this range are considered very good (Creswell, 2004).

Table 4.2a Correlations and Descriptive statistics of Mathematics achievement and school culture elements in high performing school

	Mathematics Achievement	Collaborative Leadership	Teacher Collaboration	Professional Development	Unity of Purpose	Collegial Support	Learning Partnership
Mathematics Achievement	1.000						
Collaborative Leadership	-.396	1.000					
Teacher Collaboration	.003	.008	1.000				
Professional Development	-.283	.466	.138	1.000			
Unity of Purpose	-.509	.590	.064	.564	1.000		
Collegial Support	-.273	.378	-.083	.459	.541	1.000	
Learning p	-.418	.442	-.052	.343	.598	.457	1.000
Mean	26.78	32.95	16.73	15.03	15.79	12.06	13.08
StdDeviatn	4.52	2.71	1.73	1.99	1.98	1.29	2.15

* *>.66*

Table 4.2b Correlations and Descriptive statistics of Mathematics Achievement and School culture elements in Low Performing Schools

	Mathematics Achievement	Collaborative Leadership	Teacher Collaboration	Professional Development	Unity of Purpose	Collegial Support	Learning Partnership
Mathematics Achievement	1.000						
Collaborative Leadership	.316	1.000					
Teacher Collaboration	.252	.198	1.000				
Professional Development	.377	.222	.237	1.000			
Unityof Purpose	.345	.124	.131	.117	1.000		
Collegial Support	.379	.039	.085	.192	.142	1.000	
Learning Partnership	.434	.322	.044	.055	.130	.030	1.000
Mean	14.95	24.99	13.14	10.69	12.53	9.19	9.20
StdDeviatn	3.35	2.79	1.78	1.64	1.26	.99	1.28

* >.66

Multicollinearity: Tables 4.2a/b shows that there was a relationship between achievement in Mathematics and variables of school culture. From the Table, the relationship between elements of school culture in high and low performing schools is not strong. This shows that there was no multicollinearity between the school culture sub-scales. This finding is in line with Brace, Kemp and Snelgar (2006) assertion that correlation between criterion and predictor should be less than .80 in order to establish multicollinearity. The Tables also show the descriptive statistics of high and low performing schools' culture sub-scale. From the results, the mean scores of high performing schools were greater than those of low performing schools. It can be clearly seen that students from high performing schools did well in the test; also the culture of high performing schools is different from that of low performing schools.

Table 4.3a Correlations and Descriptive statistics of Mathematics Achievement and School Structure of High Performing Schools

	Mathematics Achievement	Conducive Environment	Personalised Environment	School Based Decision	Monitoring Students' Progress	Implementing Continuing Class	Extra-Curricular Activities
Mathematics Achievement	1.000						
Conducive Environment	-.496	1.000					
Personalised Environment	-.443	.600	1.000				
SchoolBased Decision	-.359	.433	.750*	1.000			
Monitoring Students' Progress	-.146	.502	.436	.326	1.000		
Implementing Continuing Class	.178	-.129	.079	-.097	.124	1.000	
Extra-Curricular Activities	-.392	.554	.415	.153	.385	-.011	1.000
Mean -	26.78	35.00	19.81	18.69	27.04	12.45	11.69
StdDeviatn -	4.52	3.92	2.61	2.60	1.66	1.15	1.73

* >.66

Table 4.3b Correlations and Descriptive statistics of Mathematics achievement and School Structure of Low Performing Schools

	Mathematics Achievement	Conducive Environment	Personalized Environment	School Based Decision	Monitoring Students' Progress	Implementing Continuing Class	Extra-Curricular Activities
Mathematics Achievement	1.000						
Conducive Environment	.413	1.000					
Personalised Environment	.140	.092	1.000				
School Based Decision	.339	.206	-.057	1.000			
Monitoring Students' Progress	.330	.340	.074	.006	1.000		
Implementing Continuing Class	.281	.264	.253	.095	.471	1.000	
Extra-Curricular act	.223	.377	.100	.175	.272	.217	1.000
Mean scores	14.95	19.99	10.35	12.04	15.94	9.94	8.75
StdDeviatn 1	3.35	1.95	1.43	1.39	1.76	1.35	1.24

Multicollinearity: Tables 4.2a/b shows that there was a fair relationship between achievement in Mathematics and variables of school structure. The relationship between elements of school structure in high and low performing schools is moderate since the correlation coefficients obtained were less than .66. This shows that there was no multicollinearity between the school structure sub-scales.

The Tables also show the descriptive statistics of high and low performing schools structure sub-scale. From the results, the mean scores of high performing schools were greater than

those of low performing schools. It can be clearly seen that the structure of high performing schools is different from that of low performing ones.

Table 4.4a **Correlations and Descriptive statistics of Mathematics achievement and school practices in High Performing Schools**

	Mathematics Achievement	Developing people	Fair, firm and timely discipline	Allocating time space	Feedback reinforcement	Redesigning organisation
Mathematics Achievement	1.000	.				
Developing people	.030	1.000				
Fair, firm and timely discipline	-.362	.160	1.000			
Allocating time space	-.032	.091	.003	1.000		
Feedback reinforcement	-.149	.244	.233	.137	1.000	
Redesigning organization	.251	.099	-.124	.012	.445	1.000
Mean	26.78	15.95	11.04	16.56	21.24	11.73
Std Deviation	4.52	1.48	1.29	1.15	1.96	1.28

Table 4.4b Correlations and Descriptive statistics of Mathematics achievement and school Practices in Low Performing Schools

	Mathematics Achievement	Developing people	Fair, firm and timely discipline	Allocating time space	Feedback reinforcement	Redesigning organization
Mathematics Achievement	1.000					
Developing people	-.005	1.000				
Fair, firm and timely discipline	-.142	.119	1.000			
Allocating time space	.217	.101	-.087	1.000		
Feedback reinforcement	-.418	.121	.020	-.315	1.000	
Redesigning organ	.086	.110	.044	.084	.177	1.000
Mean	14.95	9.25	7.08	10.16	12.71	6.76
StdDeviatn	3.35	1.43	1.16	1.38	1.52	1.11

Multicollinearity: Tables 4.4a/b shows that there was a fair relationship between achievement in Mathematics and variables of school practices. The relationship between elements of school practices in high and low performing schools is moderate since the correlation coefficients obtained were less than .6. This shows that there was no multicollinearity between the school practices sub-scales.

The tables also show the descriptive statistics of high and low performing schools practices sub-scale. From the results, the mean scores of high performing schools were greater than those of low performing schools. It can be clearly seen that the practices of high performing schools is different from that of low performing school.

Table 4.5a Correlations and Descriptive Statistics of School Culture, Structure and Practices of Low Performing Schools

		Meanachi	Schl.Culture	Schl.Practices	SchlStructure
Pearson Correlation	Meanachi	1.000			
	School Culture	.628	1.000		
	School Practices	-.140	-.085	1.000	
	School Structure	.403	.415	-.201	1.000
	Mean	14.95	79.70	45.96	77.00
	Std Deviation	3.34	5.46	3.15	5.29

Table 4.5b Correlations and Descriptive Statistics of School Culture, Structure and Practices of High Performing Schools

		Mean achi	Schl. Culture	Schl. Practices	Schl Structure
Pearson Correlation	Mean achi	1.000			
	School Culture	-.072	1.000		
	School Practices	-.116	.235	1.000	
	School Structure	-.370	.047	.524	1.000
	Mean	26.78	117.71	82.03	133.48
	Std Deviation	4.52	6.21	6.91	9.49

Multicollinearity: Tables 4.5a/b show that there was a fair relationship between achievement in Mathematics and variables of school culture structure and practices. The relationship between elements of school culture, structure and practices in high and low performing schools is moderate. This shows that there was no multicollinearity in the school culture, structure and practices sub-scales. Brace, Kemp and Snelgar (2006) support that correlation between criterion and predictor should not be very strong (r >.80).

The Tables also show the descriptive statistics of high and low performing schools' culture, structure and practices. From the results, the mean scores of high performing schools were greater than that of low performing schools. It can be clearly seen that students

from high performing schools did well in the test. Also, the culture, structure, and practices of high performing schools were different from that of low performing schools.

Table 4.6 Model Summary of School Culture and achievement of High and Low performing schools

School Type	R	R Square	Adjusted R Square	Std. Error of the Estimate
High	.540[a]	.291	.233	3.96074
Low	.689[a]	.475	.432	2.52279

Table 4.7 ANOVA[b] of School Culture and Achievement of High/Low Performing Schools

Type of School	Sources of variation	Sum of Squares	Df	Mean Square	F	Sig.
High Achiever	Regression	470.499	6	78.416	4.999	.000[a]
	Residual	1145.186	73	15.687		
	Total	1615.684	79			
Low Achiever	Regression	420.646	6	70.108	11.015	.000[a]
	Residual	464.605	73	6.364		
	Total	885.252	79			

The models revealed the strength of the association/magnitude of the relationship between the elements of school culture and achievement in Mathematics in high and low performing schools respectively. (R) is .540 and .689

This means that there was a .540 and .689 degree of relationship between achievement in Mathematics and the six elements of school culture in high and low performing schools in Mathematics. The relationship is positive and considered moderate since it is greater than 0. The coefficients of determination (R^2) for school culture were .291 and .475. This shows that 29.1% and 47.5% of the proportion of the total variance of Mathematics test scores was shared with the linear combination of the six elements of school culture in high and low performing schools in Mathematics respectively.

The adjusted coefficient of multiple determinations (Adjusted R^2) for school culture was .233 and .432.This mean that 23.3% and 43.2% of culture was the predicted amount of shared variance between the variables, but was adjusted mathematically to estimate this value for the population. It is a maximum likelihood estimate of what would be obtained if the entire population was involved instead of the sample population. The standard error of estimate was 3.961 and 2.523 respectively. The standard error of estimate provides a measure of the standard distance between a regression line and the actual data points and indicates how accurate the predictions will be (Smith, 2006).

This shows that 23.3% of the variance observed in high performing schools in Mathematics and 43.2% of the variance observed in low performing schools in Mathematics was accounted for by all the predictors and this variance/observation is statistically significant in high and low performing schools respectively, School Culture; F (6, 73) =4.999 and F (6, 73) =11.015 $P<0.05$

The models revealed the strength of the association/magnitude of the relationship between the elements of school culture, structure and practices and achievement in Mathematics in high and low performing schools respectively. Magnitude of the relationship (R) for culture is .540 and .689

This means that there was a .540 and .689 degree of relationship between achievement in Mathematics and the six elements of school culture in high and low performing schools in Mathematics. The relationship is positive and considered moderate since it is greater than 0.

(a). The coefficient of determination (R^2) for school culture was .291 and .475. This shows that 29.1% and 47.5% of the proportion of the total variance of Mathematics test scores was shared with the linear combination of the six elements of school culture in high and low performing schools in Mathematics respectively.

(b). The adjusted coefficient of multiple determination (Adjusted R^2) for school culture were .233 and .432.This mean that 23.3% and 43.2% of culture were the predicted amounts of shared variances between the variables, but were adjusted mathematically to estimate these values for the population. It is a maximum likelihood estimate of what is to be obtained if the whole population was involved rather than the sample population. The standard error of estimate was 3.961 and 2.523 respectively. The standard error of estimate

provides a measure of the standard distance between a regression line and the actual data points and indicates how accurate the predictions will be (Smith, 2006).

This shows that 23.3% of the variances observed in the high performing school culture in Mathematics and 43.2% of the variances observed in the low performing school culture in Mathematics was accounted for by all the school culture elements (predictors) and these variances/observations were statistically significant in high and low performing schools respectively, School Culture; F(6,73) =4.999 and F (6,73) =11.015 P<0.05

The observed variance was statistically significant in high and low performing schools' culture, F(6,73)=4.999 and F(6,73) = 11.015 p<0.05

It shows that in high and low performing schools, there was a significant portion of explained variance in achievement in Mathematics as shown in tables' 4.6/4.7. Therefore, the obtained regression equation allowed the reliable prediction of Achievement in Mathematics.

Table 4.8 Model Summary of School Structure and Achievement of High and Low Performing Schools

Type of school	R	R Square	Adjusted R Square	Std. Error of Estimate
High	.587	.345	.291	3.80786
Low	.550	.303	.245	2.90811

Table 4.9 ANOVA of School Structure and Achievement of High/Low Performing Schools

Type of School	Sources of variation	Sum of Squares	Df	Mean Square	F	Sig.
High Achiever	Regression	557.201	6	92.867	6.405	.000[a]
	Residual	1058.483	73	14.500		
	Total	1615.684	79			
Low Achiever	Regression	267.881	6	44.647	5.279	.000[a]
	Residual	617.371	73	8.457		
	Total	885.252	79			

The models revealed the strength of the association/magnitude of the relationship between the elements of school structure and achievement in Mathematics in high and low performing schools respectively. Magnitude of the relationship (R), for school structure is .587 and .550. This means that there was a .587 and .550 degree of relationship between achievement in Mathematics and elements of school structure in high and low performing schools in Mathematics. The relationship was positive and considered moderate since it is greater than 0.

The coefficient of determination (R^2) for school structure .345 and .303 shows that 34.5% and 30.3% of the total variance of Mathematics test scores were shared with the linear combination of the six elements of school structure in high and low performing schools in Mathematics respectively.

The adjusted coefficients of multiple determinations (Adjusted R^2) in high and low performing schools were .291 and .245. This means that 29.1% and 24.5% of structure was the predicted amount of shared variance between the variables but was adjusted mathematically to estimate this value for the population. It is a maximum likelihood estimate of what is to be obtained if the whole population had been involved instead of the sample. The standard errors of estimate were 3.81 and 2.91 respectively. The standard of error estimate provides a measure of the standard distance between a regression line and the actual data points and indicates how accurate the predictions will be (Smith, 2006).

This shows that 29.1% of the variance observed in high performing schools' structure in Mathematics and 24.5% of the variance observed in low performing schools' structure in Mathematics is accounted for by all the school structure elements (predictors) and these variances/observations are statistically significant in high and low performing schools respectively, School Structure; F (6, 73) =6.405 and F (6, 73) =5.279 P<0.05

The observed variance was statistically significant in high and low performing schools' structure, F=6.405 and F=5.279 is significant, F(6.73) =6.405 and F(6,73) =5.279 p<0.05.

It shows that in high and low performing schools, there was a significant portion of explained variance in achievement in Mathematics as shown in tables 4.8/9. Therefore, the obtained regression equation allowed the reliable prediction of Achievement in Mathematics.

Table 4.10: Model Summary of School Practices and Achievement of High and Low Performing Schools

Type of school	R	R Square	Adjusted R Square	Std. Error of Estimate
High	.471	.222	.169	4.12258
Low	.474	.225	.173	3.04510

Table 4.11 ANOVA of School Practices of High/Low Performing Schools

Type of School	Sources of variation	Sum of Squares	Df	Mean Square	F	Sig.
High Achiever	Regression	358.006	5	71.601	4.213	.002[a]
	Residual	1257.679	74	16.996		
	Total	1615.684	79			
Low Achiever	Regression	199.076	5	39.815	4.294	.002[a]
	Residual	686.176	74	9.273		
	Total	885.252	79			

The models revealed the strength of the association/magnitude of the relationship between the elements of school practices and achievement in Mathematics in high and low performing schools respectively. (R), for practices were .471 and .474.

This means that there was a .471 and .474 degree of relationship between achievement in Mathematics and elements of school practices in high and low performing schools in Mathematics. The relationship is positive and considered low since it is greater than 0.

The coefficient of determination (R) for practices were .222 and .225 which shows that 22.2% and 22.5% of total variance in Mathematics score was shared with the linear combination of the five elements of school practices in high and low performing schools in Mathematics respectively.

The adjusted coefficient of multiple determination (Adjusted R2) for school practices were .169 and.173. This means that 16.9% and 17.3% of school practices were the predicted amounts of shared variances between the variables but was adjusted mathematically to estimate this value for the population. It is a maximum likelihood estimate of what would have been obtained if the whole population had been involved instead of the sample

population. The standard errors of estimate were 4.123 and 3.045 respectively. The standard error of estimate provides a measure of the standard distance between a regression line and the actual data points and indicates how accurate the predictions will be (Smith, 2006).

This shows that 16.9% of the variance observed in practices of high performing schools' in Mathematics and 17.3% of the variance observed in low performing schools' practices in Mathematics is accounted for by all the school practices elements (predictors) and these variances/observations are statistically significant in high and low performing schools respectively. School Practices; F (5, 74) = 4.213 and F (5,74) =4.294 P< 0.05

The observed variance was statistically significant in high and low performing schools practices, F=4.213 and F=4.294 p<0.05

Table 4.12 Model Summary of School Culture, Structure and Practices and Achievement of High/Low Performing Schools

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
low	.681[a]	.463	.442	2.50075
high	.322[a]	.104	.068	4.3612

a Predictors:(Constant),School structure, Practices, Culture

Table 4.13: ANOVA of School Culture, Structure and Practices of High/Low performing Schools

Model		Sum of squares	Df	Mean Square	F	sig.
Low	Regression	409.967	3	136.656	21.852	.000[a]
	Residual	475.284	76	6.254		
	Total	885.252	79			
High	Regression	167.551	3	55.850	2.931	.039[a]
	Residual	1448.133	76	19.054		
	Total	1615.684	79			

a. Predictors: (Constant), School Culture, Structure, Practices

b. Dependent Variable: Mean achievement

The models on tables 4.12 revealed the strength of the association/magnitude of the relationship between the school culture, structure and practices and achievement in Mathematics in low and high performing schools respectively. Magnitude of the relationship (R), were .681 and .322 respectively.

This means that there was a .681 and .322 degree of relationship between achievement in Mathematics and school culture, structure and practices in high and low performing schools. The relationship is positive and considered fair since it is greater than 0. The coefficient of determination (R^2) were .463and .104 which shows that 46.3% and 10.4% of total variance in Mathematics score was shared with the linear combination of the school culture, structure and practices in high and low performing schools in Mathematics respectively.

The adjusted coefficients of multiple determinations (Adjusted R^2) for independent variables were .442 and .068. This means that 44.2% and 06.8% of school culture, structure and practices were the predicted amounts of shared variances between the variables but were adjusted mathematically to estimate this value for the population. It is a maximum likelihood estimate of what would have been obtained if the whole population had been involved instead of the sample. The standard errors of estimate were 2.501 and 4.361 respectively. The standard error of estimate provides a measure of the standard distance between a regression line and the actual data points and indicates how accurate the predictions will be (Smith, 2006).

This shows that 06.8% of the variance observed in high performing schools' in Mathematics and 44.2% of the variance observed in low performing schools in Mathematics was accounted for by all the predictors and these variances/observations are statistically significant in high and low performing schools respectively. Predictors; F (3, 76) = 2.93 and F (3, 76) =21.85 P< 0.05

The observed variance was statistically significant in high and low performing schools' culture, structure, and practices F=2.93and F=21.85 is significant, F(3.76) =2.93 and F(3,76) =21.85 p<0.05

It shows that in high and low performing schools, there was a significant portion of explained variance in achievement in Mathematics as shown in tables' 4.12 and 4.13.

Therefore the obtained regression equation allowed the reliable prediction of achievement in Mathematics.

Research Question 2(ii) Does the obtained regression equation resulting from a set of three predictor variables (school culture, structure and practices) allow reliable prediction of students' Mathematics self-efficacy in high and low performing schools?

Table 4.14a Correlations of Mathematics self-efficacy and school culture of High Performing Schools

	Mathematics self-efficacy	Collaborative Leadership	Teacher Collaboration	Professional Development	Unity of Purpose	Collegial Support	Learning Partnership
Mathematics self-efficacy	1.000						
Collaborative Leadership	.045	1.000					
Teacher Collaboration	-.106	.008	1.000				
Professional Development	-.138	.466	.138	1.000			
Unity of Purpose	.023	.590	.064	.564	1.000		
Collegial Support	-.121	.378	-.083	.459	.541	1.000	
Learning Partnership	.116	.442	-.052	.343	.598	.457	1.000
Mean	134.22	32.95	16.73	15.03	15.79	12.06	13.08
StdDev	6.02	2.73	1.73	2.00	1.99	1.29	2.15

Table 4.14b Correlations of Mathematics self-efficacy and school culture of Low Performing Schools

	Mathematics self-efficacy	Collaborative Leadership	Teacher Collaboration	Professional Development	Unity of Purpose	Collegial Support	Learning Partnership
Mathematics self-efficacy	1.000						
Collaborative Leadership	.306	1.000					
Teacher Collaboration	.158	.198	1.000				
Professional Development	.219	.222	.237	1.000			
Unity of Purpose	.255	.124	.131	.117	1.000		
Collegial Support	.328	.039	.085	.192	.142	1.000	
Learning Partnership	.416	.322	.044	.055	.130	.030	1.000
Mean	98.19	24.96	13.14	10.69	12.53	9.19	9.20
StdDev	11.65	2.79	1.77	1.63	1.26	.99	1.28

Table 4.15a Correlations of Mathematics self-efficacy and School Structure of High Performing Schools

	Mathematics self-efficacy	Conducive Environment	Personalized Environment	School Based Decision	Monitoring Students' Progress	Implementing Continuing Class	Extra-Curricular Activities
Mathematics self-efficacy	1.000						
Conducive Environment	.092	1.000					
Personalized Environment	-.080	.600	1.000				
School Based Decision	-.029	.433	.750*	1.000			
Monitoring Students' Progress	-.004	.502	.436	.326	1.000		
Implementing Continuing Class	-.160	-.129	.079	-.097	.124	1.000	
Extra-Curricular Activities	.078	.554	.415	.153	.385	-.011	1.000
Mean	134.22	35.00	19.82	18.69	27.04	12.45	11.69
StdDev	6.02	3.93	2.62	2.60	1.66	1.15	1.73

* >.66

Table 4.15b Correlations of Self-Efficacy and School Structure of Low performing Schools

	Mathematics self-efficacy	Conducive Environment	Personalized Environment	School Based Decision	Monitoring Students' Progress	Implementing Continuing Class	Extra-Curricular Activities
Math self-eff	1.000						
Conducive Environment	.317	1.000					
Personalized Environment	.159	.092	1.000				
School Based Decision	.309	.206	-.057	1.000			
Monitoring Stud' Progress	.227	.340	.074	.006	1.000		
Implementing Cont Class	.159	.264	.253	.095	.471	1.000	
Extra-Cur Activities	.281	.377	.100	.175	.272	.217	1.000
Mean	98.19	19.99	10.35	12.04	15.94	9.94	8.75
Std Dev	11.65	1.95	1.43	1.39	1.76	1.35	1.24

Table 4.16a Correlations of Self- Efficacy and School Practices of High Performing Schools

	Mathematics self-efficacy	Developing people	Fair, firm and timely discipline	Allocating time space	Feedback reinforcement	Redesigning organization
Math self-efficacy	1.000					
Dev people	-.183	1.000				
Fair,firmandtimely discipline	-.040	.160	1.000			
Allo time space	-.046	.091	.003	1.000		
Feedback reinf	-.096	.244	.233	.137	1.000	
Red organization	-.151	.099	-.124	.012	.445	1.000
Mean	134.21	15.95	11.04	16.56	21.24	11.73
Std Dev	6.02	1.48	1.29	1.15	1.96	1.28

Table 4.16b Correlations of Self- Efficacy and School Practices of Low Performing Schools

	Maths Efficacy	Developing people	Fair, firm and timely discipline	Allocating time space	Feedback reinforcement	Redesigning organization
Math Efficacy	1.000					
Developing people	-.005	1.000				
Fair,firmandtimely discipline	.111	.119	1.000			
Allocating time space	.004	.101	-.087	1.000		
Feedback reinforcement	-.299	.121	.020	-.315	1.000	
Red organisatn	.041	.110	.044	.084	.177	1.000
Mean	98.19	9.25	7.08	10.16	12.71	6.76
Std Dev	11.65	1.43	1.16	1.38	1.52	1.12

Table 4.17a

Correlations of Culture, structure and practices with Self-Efficacy in High Performing Schools

		Meaneffic	schlCulture	schoolPractices	SchlStructure
Pearson Correlation	Meaneffic	1.000			
	Culture	-.124	1.000		
	schoolPractices	-.276	.235	1.000	
	SchlStructure	-.235	.047	.524	1.000
	Mean	134.215	117.71	82.025	133.47
	Std Deviation	6.016	6.214	6.914	9.497

Table 4.17b

Correlations of Culture, structure and practices with self-efficacy in Low Performing Schools

		Meaneffic	schlCulture	schlPractices	SchlStructure
Pearson Correlation	Meaneffic	1.000			
	Schl Culture	.472	1.000		
	Schl Practices	-.129	-.085	1.000	
	SchlStructure	.295	.415	-.201	1.000
	Mean	98.1870	91.94	54.500	82.6875
	Std Deviatn	11.6509	7.797	3.829	5.083

Multicollinearity: Tables 4.14a to 4.17b shows that the relationship between the variables was not strong. The relationship between Mathematics self-efficacy and elements of school cultures, structure and practices in high and low performing school is fair since the coefficients obtained were less than .66. This shows that there was no multicollinearity in the school culture, structure, and practices sub-scales. Likewise, there was no multicollinearity in school culture, structure and practices scale.

Table 4.18 Model Summary of School Culture and Self- Efficacy of High/ Low Performing Schools

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
High performing schools	.293[a]	.086	.011	5.98320
Low performing schools	.578[a]	.335	.280	9.88731

Table 4.19 ANOVA[b] of School Culture and Self- Efficacy of High/ Low Performing Schools

Type of School	Sources of variation	Sum of Squares	Df	Mean Square	F	Sig.
High Performing	Regression	245.586	6	40.931	1.143	.346[a]
	Residual	2613.306	73	35.799		
	Total	2858.892	79			
Low Performing	Regression	3587.441	6	597.907	6.116	.000[a]
	Residual	7136.396	73	97.759		
	Total	10723.837	79			

Table 4.20 Model Summary of school Structure and Self- Efficacy of High/ Low Performing Schools

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
High performing schools	.238[a]	.057	-.021	6.07853
Low performing schools	.468[a]	.219	.154	10.71372

4.21 ANOVA[b] of School Structure and Self-Efficacy of High/ Low Performing Schools

Typeof Schl	Sourcesof variation	Sumof Squares	Df	Mean Square	F	Sig.
High Performing	Regression	161.651	6	26.942	.729	.628[a]
	Residual	2697.240	73	36.948		
	Total	2858.892	79			
Low Performing	Regression	2344.619	6	390.770	3.404	.005[a]
	Residual	8379.218	73	114.784		
	Total	10723.837	79			

Table 4.22 Model Summary of School Practices and Self- Efficacy of High/Low Performing Schools

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
High performing schools	.231[a]	.053	-.011	6.04721
Low performing schools	.349[a]	.122	.063	11.28007

Table 4.23 ANOVA[b] of School Practices and Self-Efficacy of High/ Low Performing Schools

Type of School	Sources of variation	Sum of Squares	Df	Mean Square	F	Sig.
High Performing	Regression	152.801	5	30.560	.836	.529[a]
	Residual	2706.090	74	36.569		
	Total	2858.892	79			
Low Performing	Regression	1308.075	5	261.615	2.056	.081[a]
	Residual	9415.761	74	127.240		
	Total	10723.837	79			

The models,(tables 4.18, 4.20 and 4.22) revealed the strength of the association or magnitude of the relationship between the elements of school culture, structure, practices and Mathematics self-efficacy in high and low performing schools. (R), for culture is .293 and .578, (R) of structure is .238 and .468 and (R) of practice is .231 and .349 in high and low performing schools respectively. This means that there was .293 and .578 degree of relationship between Mathematics self-efficacy and the six elements of school culture, .238 and .468 degree of relationship between self-efficacy and six elements of structure and .231 and .349 degree of relationship between Mathematics self-efficacy and five elements of school practices. The relationship was positive and considered moderate since it is greater than 0.

The coefficient of determination (R^2) of school culture was .086 and.335, that of school structure was .057 and .219, while that of school practices was .053 and .122.This shows that 08.6% and 33.5% of the proportion of the total variance of Mathematics self-efficacy

was shared with the linear combination of the six elements of school culture, 5.7% and 21.9% of the proportion of the total variance of Mathematics self-efficacy were shared with the linear combination of the six elements of school structure. In addition, 5.3% and 12.2% of the proportion of the total variance of Mathematics self-efficacy were shared with the linear combination of the five elements of school practices in high and low performing schools respectively.

The adjusted coefficient of multiple determination (Adjusted R^2) were .011 and.280 for culture, -.021 and .154 for school structure and -.011 and .063 for school practices .This mean that 01.1% and 28.0% of culture, 2.1% and 15.4% of structure, 1.1% and 6.3% of practices were the predicted amounts of shared variances between the variables but were adjusted mathematically to estimate this value for the population. It is a maximum likelihood estimate of what would have been obtained if the whole population had been involved instead of the sample population. This shows that 01.1% (culture), 2.1% (structure) and 1.1% (practices) of the variance observed in high performing schools' Mathematics self-efficacy and 28.0% (culture) ,15.4% (structure) and 6.3% (practices) of the variance observed in low performing schools' Mathematics self-efficacy is accounted for by all the predictors and these variances/observations are statistically significant in high performing schools' culture and not statistically significant in low performing schools' culture. $F(6,73) =1.143$ $P> 0.05$ and $F (6,73) =6.116$ $P<0.05$, not significant in school structure of high and low performing schools $F(6,73) = .729$ and $F(6,73) =3.404$ $P> 0.05$.They are also not statistically significant in school practices of high and low performing schools $F(5,74) =.836$ $P> 0.05$ and $F(5,74)$ $P>0.05$.

This shows that 01.1% of culture, 2.1% of structure and 15.4% of school practices of the variance observed in high performing schools' Mathematics self-efficacy and 28.0% of culture, 1.1% of structure and 6.3% of the schools' practices of the variance observed in low performing schools in Mathematics self-efficacy is accounted for by all the predictors and these variances/observations were not statistically significant in high performing schools' culture and high and low performing schools' structure and school practices but statistically significant in low performing school culture. For culture $F(6,73) =1.143$ $P>0.05$ and $F (6,73) =6.116$ $P<0.05$,for structure $F(6,73) =.729$ and $F(6,73) =3.404$ $P>0.05$, for practices $F(5,74) =.836$ and $F(5,74) =2.056$ $P>0.05$

The observation of variance F= 1.143 of culture, F=.729 (high), and F==3.404 (low) of structure and F=.836 (high) and F=2.056 (low) was not statistically significant while in low performing school culture F=6.116 was statistically significant.

It shows that in high performing schools' culture and high and low performing schools' structure and practices, there was not a significant portion of explained variance in Mathematics self-efficacy. It is only in low performing schools culture that there was a significant portion of explained variance (table 4.9). Therefore, the obtained regression equation does not allow the reliable prediction of Mathematics self-efficacy in high performing schools' culture, and high/low performing schools' structure and practices. In low performing schools' culture however, the obtained regression equation allows reliable prediction of Mathematics self-efficacy.

Table 4.24 Model Summary of Schools Culture, Structure and Practices and Self-Efficacy of Low/High performing Schools

	R	R Square	Adjusted R Square	Std. Error of the Estimate
Low	.526[a]	.277	.248	10.10261
High	.321[a]	.103	.067	5.80939

a. Predictors: (Constant), School Structure, school Practices, Culture

Table 4.25 ANOVA of School Culture, Structure and Practices and Self-Efficacy of High/ Low Performing Schools

Model			Df	Mean Square	F	Sig.
Low	Regression	Sum of Squares 2967.070	3	989.023	9.690	.000[a]
	Residual	7756.767	76	102.063		
	Total	10723.837	79			
High	Regression	293.966	3	97.989	2.903	.039[a]
	Residual	2564.925	76	33.749		
	Total	2858.892	79			

a. Predictors: (Constant), School Structure, Culture, school Practices

b. Dependent Variable: Mean efficacy

The models, tables 4.24 and 4.25 revealed the strength of the association of the relationship between the elements of school culture, structure, practices and Mathematics self-efficacy in high and low performing schools. (R) = .304 and .489 in high and low performing schools.

The models (tables 4.24 and 4.25) revealed the strength of the association of the relationship between the elements of school culture, structure, practices and Mathematics self-efficacy in high and low performing schools, And the magnitude of the relationship (R) = .304 and .489 in high and low performing schools respectively. This means that there was .304 and .489 degree of relationship between Mathematics self-efficacy and school culture, structure and practices. The relationship is positive and considered moderate since it is greater than 0.

The coefficient of determination (R^2) of school culture, structure and practices were .093 and .240 in high and low performing schools respectively. This shows that 9.3% and 24.0% of the proportion of the total variance of Mathematics self-efficacy were shared with the linear combination of the school predictor variables in high and low performing schools respectively.

The adjusted coefficient of multiple determination (Adjusted R^2) were .057 and.210.This means that 05.7% and 21.0% were the predicted amounts of shared variances between the variables but were adjusted mathematically to estimate this value for the population. It is a maximum likelihood estimate of what would be obtained if the whole population had participated instead of the sample population. This shows that 05.7% of the variance observed in high performing schools' Mathematics self-efficacy and 21.0% of the variance observed in low performing school Mathematics self-efficacy is accounted for by all the predictors and these variances are statistically significant in low performing schools and not statistically significant in high performing schools F (3,76) =7.81 P> 0.05 and F (3,76) =2.582 P<0.05 .

This shows that 05.7% of the variance observed in high performing schools' Mathematics self-efficacy and 21.0% of the variance observed in low performing schools in Mathematics self-efficacy is accounted for by all the predictors and these variances/observations were not statistically significant in high performing schools but statistically significant in low performing schools. The observation of variance F= 2.582 (high), is not statistically significant while F==7.81 (low) was statistically significant.

It shows that in high performing schools, there was not a significant portion of explained variance in Mathematics self-efficacy. It is only in low performing schools that there was a significant portion of explained variance. Therefore, the obtained regression equation does not allow the reliable prediction of Mathematics self-efficacy in high performing schools. While in low performing school, the obtained regression equation allows reliable prediction of Mathematics self-efficacy.

4.1.4 Research Question 3i. Which of the predictors is the most influential in predicting students' achievement in Mathematics?

Table 4.26a Coefficients of School Culture and Achievement of High Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	48.417	7.526		6.433	.000		
Collaborative Leadership	-.220	.210	-.132	-1.050	.297	.612	1.633
Teacher Collaboration	.051	.266	.020	.193	.847	.943	1.061
Prof Development	.045	.287	.020	.158	.875	.607	1.647
Unity of Purpose	-.840	.349	-.369	-2.404	.019*	.413	2.421
Collegial Support	.157	.436	.045	.360	.720	.630	1.586
Learning Partnership	-.348	.268	-.165	-1.299	.198	.602	1.662

*p<.05

Table 4.26b Coefficients of School Culture and Achievement of Low Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	-19.691	4.544		-4.333	.000		
Collaborative Leadership	.112	.112	.093	1.000	.320	.832	1.201
Teacher Collaboration	.211	.167	.112	1.262	.211	.912	1.096
Professional Development	.477	.185	.233	2.576	.012*	.881	1.136
Unity of Purpose	.546	.231	.206	2.361	.021*	.944	1.059
Collegial Support	.945	.293	.281	3.224	.002*	.947	1.056
Learning Partnership	.920	.236	.351	3.897	.000*	.887	1.128

*p<.05

Table 4.27a Coefficients of School Structure and Achievement of High Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	35.529	8.385		4.237	.000		
Conducive Environment	-.353	.161	-.306	-2.187	.032*	.458	
Personalised Environment	-.327	.305	-.189	-1.071	.288	.288	3.477
SchoolBased Decision	-.180	.269	-.104	-.670	.505	.376	2.662
Monitoring Students' Progress	.508	.314	.186	1.616	.110	.677	1.477
Implementing Continuing Class	.466	.406	.118	1.149	.254	.849	1.178
Extra-Cur Act	-.521	.316	-.199	-1.649	.103	.618	1.619

*p<.05

Table 4.27b Coefficients of School Structure and Achievement of Low Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	-12.351	5.037		-2.452	.017		
Conducive Environment	.449	.192	.261	2.339	.022*	.767	1.305
Personalized Environment	.237	.238	.102	.996	.323	.919	1.088
School Based Decision	.683	.245	.284	2.793	.007*	.924	1.082
Monitoring Students' Progress	.385	.222	.202	1.738	.086	.704	1.420
Implementing Continuing Class	.161	.286	.065	.562	.576	.712	1.404
Extra-Curricular Activities	-.011	.293	-.004	-.038	.970	.816	1.225

*p<.05

Table 4.28a Coefficients of School Practices and Achievement of High Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	32.390	9.688		3.343	.001		
Developing people	.322	.325	.105	.989	.326	.925	1.081
Fair, firm and timely discipline	-.990	.387	-.282	-2.560	.012*	.868	1.152
Allocating time space	-.041	.411	-.010	-.100	.921	.972	1.029
Feedback reinforcement	-.574	.287	-.248	-1.997	.050*	.681	1.469
Redesigning organization	1.113	.419	.316	2.654	.010*	.744	1.345

*p<.05

Table 4.28b Coefficients of School Practices and Achievement of High Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	24.515	5.369		4.566	.000		
Developing people	.096	.247	.041	.387	.700	.943	1.060
Fair, firm and timely discipline	-.407	.300	-.140	-1.354	.180	.973	1.028
Allocating time space	.123	.268	.051	.460	.647	.854	1.171
Feedback reinforcement	-.952	.246	-.432	-3.869	.000*	.840	1.191
Redesigning organization	.485	.320	.160	1.517	.134	.940	1.064

*p<.05

Table 4.29a Coefficients of School Culture, Structure, Practices and Achievement of Low Performing Schools

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-14.262	6.218		-2.294	.025		
	SchlCulture	.202	.042	.470	4.764	.000*	.727	1.376
	SchoolPractices	-.067	.090	-.063	-.745	.459	.989	1.011
	Schoolstructure	.178	.060	-.293	2.972	.004*	.725	1.379

a. Dependent Variable: Mean achievement

*p<.05

Table 4.29b Coefficients of School Culture, Structure, Practices and Achievement of High Performing Schools

Model	Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
	B	Std. Error	Beta	T	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	54.654	12.143		4.501	.000					
Culture	-.038	.082	-.052	-.467	.642	-.072	-.086	-.080	.935	1.070
schoolPractices	.030	.126	.033	1.240	.811	-.116	.116	.108	.625	1.600
SchlStructure	-.191	.077	-.332	-2.488	.015	-.370	-.371	-.368	.660	1.514

a. Dependent Variable: Mean achievement

Table 4.24- 4.27 reports the standardised beta (β) coefficients which gives a measure of the contribution of each variable to the model in terms of standard deviations. β is the predicted standard deviation (SD) of the dependent (criterion) variable for a change of one (1) SD in the independent (predictor) while controlling for the other predictors. It means that if each of the independent variables increases by one (1) SD, the dependent will increase by the beta

values. The F and sig (P) values give a rough indication of the impact of each predictor variable. A big absolute t value and small P value suggests that a predictor variable is having a large impact on the criterion variable.

The tolerance values are a measure of the correlation between the predictor variables and can vary between 0 and 1.The closer to zero the tolerance value is for a variable, the stronger the relationship between this and the other predictor variables.

V/F is an alternative measure of collinearity (reciprocal of tolerance) in which a large value indicates a strong relationship between predictor variables.

School Culture; table 4.26a shows that unity of purpose (β= -.369, t= -2.404, P< 0.05) was the most influential predictor of Mathematics achievement in high performing schools. Also, table 4.26b shows that professional development (β =.233, t=2.576,P< 0.05),unity of purpose (β=.206,t=2.361, P<0.05), collegial support (β=.281,t=3.224,P<0.05) and learning partnership (β=.351, t=3.897, P<0.05) are the most influential predictors of achievement in Mathematics in low performing schools.

School Structure: Table 4.27a shows that Conducive environment (β=-.306, t=-2.187, P<0.05) was the most influential predictor of achievement in Mathematics in high performing schools. Also, table 4.27b indicates Conducive environment (β=.261, t= 2.339, P<0.05) and School based decision making (β= .284, t=2.793, P<0.05) as the most influential predictors of achievement in low performing schools.

School Practices: Table 4.28a shows that in high performing schools in Mathematics, Fair, firm and timely discipline (β= -.282, t= -2.560, p< 0.05), Feedback and reinforcement (β= -.248, t= -1.997), and Redesigning the Organisation (β= .316, t=2.654, P<0.05) were the most influential predictors of achievement while Feedback and reinforcement (β= -.432, t=-3.869, P< 0.05) was the most influential predictor of achievement in low performing schools in Mathematics as shown in table 4.28b.

School culture, structure and practices: Table 4.33a shows that in low performing schools, school culture (β= .471, t= 4.513, p< 0.05) and structure (β= .244, t= 2.335, p< 0.05) significantly predicted achievement. While in high performing schools, school structure significantly predicted achievement. (β= -.435, t= -.487, p<.05).

4.1.5 Research question 3ii: Which of the predictors is the most influential in predicting students' Mathematics self-efficacy?

Table 4.30a Coefficients of School Culture and Self- Efficacy of High Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	143.170	11.369		12.593	.000		
Collaborative Leadership	.165	.317	.075	.522	.603	.612	1.633
Teacher Collaboration	-.334	.401	-.096	-.832	.408	.943	1.061
Professional Development	-.536	.433	-.178	-1.236	.220	.607	1.647
Unity of Purpose	.274	.528	.090	.519	.606	.413	2.421
Collegial Support	-.965	.659	-.206	-1.465	.147	.630	1.586
Learning Partnership	.501	.405	.179	1.239	.219	.602	1.662

*p<.05

Table 4.30b Coefficients of School Culture and Self- Efficacy of Low Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	-1.031	17.809		-.058	.954		
Collaborative Leadership	.580	.437	.139	1.327	.189	.832	1.201
Teacher Collaboration	.350	.655	.053	.533	.595	.912	1.096
Professional Development	.631	.725	.089	.871	.387	.881	1.136
Unity of Purpose	1.268	.907	.137	1.398	.166	.944	1.059
Collegial support	3.172	1.149	.271	2.761	.007*	.947	1.056
Learning Partnership	3.085	.925	.338	3.334	.001*	.887	1.128

*P<.05

Table 4.31a Coefficients of School Structure and Self- Efficacy of High Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	139.484	13.386		10.420	.000		
Conducive Environment	.235	.258	.154	.914	.364	.458	2.184
Personalised Environment	-.563	.487	-.245	-1.156	.252	.288	3.477
SchlBased Decision	.162	.429	.070	.377	.707	.376	2.662
MonitoringStuds' Progress	-.067	.502	-.018	-.133	.894	.677	1.477
Implementing Continuing Class	-.582	.647	-.111	-.899	.371	.849	1.178
Extra-Curricular Activities	.314	.504	.090	.622	.536	.618	1.619

*P<.05

Table 4.31b Coefficients of School Structure and Self- Efficacy of Low Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	17.549	18.558		.946	.347		
Conducive Environment	.975	.708	.163	1.378	.173	.767	1.305
Personalised Environment	1.188	.877	.146	1.354	.180	.919	1.088
School Based Decision	2.214	.901	.264	2.456	.016*	.924	1.082
MonitoringStuds' Progress	.950	.816	.143	1.163	.248	.704	1.420
Implementing Continuing Class	-.357	1.055	-.041	-.338	.736	.712	1.404
Extra-Curricular Act	1.213	1.078	.129	1.125	.264	.816	1.225

*P<.05

Table 4.32a Coefficients of School Practices and Self- Efficacy of High Performing Schools

Highperforming school practices/efficacy	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
CoefficientsModel	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	156.337	14.211		11.001	.000		
Developing people	-.667	.477	-.165	-1.399	.166	.925	1.081
Fair, firm and timely discipline	-.177	.567	-.038	-.313	.756	.868	1.152
Allocating time space	-.171	.602	-.032	-.283	.778	.972	1.029
Feedback reinforcement	.072	.421	.024	.172	.864	.681	1.469
Redesigning organization	-.702	.615	-.150	-1.141	.257	.744	1.345

*p<.05

Table 4.32b Coefficients of School Practices and Self- Efficacy of Low Performing Schools

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	S.E	Beta	T	Sig.	Tolerance	VIF
(Constant)	125.896	19.889		6.330	.000		
Developing people	.213	.915	.026	.233	.817	.943	1.060
Fair, firm and timely discipline	1.016	1.113	.101	.913	.364	.973	1.028
Allocating time space	-.941	.994	-.112	-.947	.347	.854	1.171
Feedback reinforcement	-2.745	.911	-.358	-3.012	.004*	.840	1.191
Redesigning organization	1.123	1.184	.107	.948	.346	.940	1.064

*p<.05

Table 4.33a Coefficients of School Culture, Structure and Practices, and Self- Efficacy of Low Performing Schools

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	15.580	25.118		.620	.537		
Culture	.494	.171	.330	2.885	.005	.727	1.376
School Practices	-.134	.363	-.036	-.368	.714	.989	1.011
School Structure	.562	.242	.226	2.322	.023	.725	1.379

Dependent Variable: Meaneffic

Table 4.33b Coefficients of School Culture, Structure and Practices, and Self- Efficacy of High Performing Schools

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	T	Sig	Tolerance	VIF
1 (Constant)	172.166	16.161		10.653	.000		
School Culture	-.056	.102	-.074	-.550	.584	.660	1.514
School Practices	-.310	.167	-.255	-1.856	.067	.625	1.600
School Structure	-.053	.109	-.055	-.490	.625	.935	1.070

School Culture; table 4.26a shows that none of the predictors was the most influential in predicting Mathematics self-efficacy in high performing schools. Also table 4.30b shows that Collegial support (β =.271, t=2.761,P< 0.05), and learning partnership (β=.338, t=3.334, P<0.05) are the most influential predictors of Mathematics self-efficacy in low performing schools in Mathematics.

School Structure; table 4.27a shows that none of the predictors variable was the most influential predictor of Mathematics self-efficacy in high performing schools, while table 4.27b indicates School based decision making (β= .264, t=2.456, P<0.05) as the most influential predictor of Mathematics self-efficacy in low performing schools.

School Practices; table 4.28a shows that in high performing schools in Mathematics, none of the predictors variables was the most influential predictor of Mathematics self-efficacy, while Feedback and reinforcement (β= -.358, t=-3.012, P< 0.05) was the most influential predictors of Mathematics self-efficacy in low performing schools as shown in table 4.28b.

School Culture, Structure and Practices; table 4.33a shows that in low performing schools, school culture and structure influences self-efficacy the most. However, none of the predictors influences self-efficacy in high performing schools (table 4.33b).

4.1.6 Research Question 4; Are there any predictor variables not contributing significantly to the prediction model?

(a) Contribution of the independent variables to Mathematics achievement;

School Culture; Tables 4.24a/b show that in high performing schools in Mathematics, collaborative leadership, teacher collaboration, professional development, collegial support and learning partnership contribution is not significant to the prediction model. In low performing schools however, only collaborative leadership and teacher collaboration contribution is not significant to the model.

School Structure; Tables 4.25a/b show that four of the variables (personalised environment, school based decision making, monitoring student progress, implementing continuum classes and extra-curricular activities did not contribute significantly to the prediction model in high performing schools while none, with the exception conducive environment and school based decision making contributed significantly to the prediction model in low performing schools.

School Practices; Tables 4.28a/b showed that none of the following variables (fair, firm and timely discipline, allocation of time and space, feedback and reinforcement as well as redesigning the organisation) contributed significantly to the prediction model in high performing schools while in low performing schools developing people, variables like firm fair and timely discipline, allocation of time and space and redesigning the organisation did not contribute significantly to the prediction model.

School Culture, Structure and Practices; tables 4.29a/b show that in low performing schools, only school practices did not contribute significantly to the prediction model, while school culture and practices did not significantly predict achievement in high performing schools. In general, only school practices did not significantly predict achievement (table 4.)

b Contribution of the independent variables to Mathematics self-efficacy;

School Culture; tables 4.30a shows that in high performing schools, none of the predictors contributed significantly to the prediction model. Table 4.30b also shows that in low performing schools, collaborative leaders, teacher collaboration, unity of purpose and professional development did not contribute significantly to the model.

School Structure; table 4.31a shows that in high performing schools,none of the elements of school structure contributed significantly to the prediction model and table 4.31b revealed that in low performing schools, conducive environment, personalised environment, monitoring student progress, implementing continuum classes and extra-curricular activities did not contribute significantly to the prediction model.

School Practices; table 4.32 a/b revealed that none of the elements of school practices contributed significantly to the prediction model except in low performing schools where feedback and reinforcement contributed significantly to the model (table 4.32b).

School Culture, Structure and Practices; tables 4.33a show that in low performing schools, only school practices did not contribute significantly to the prediction model while in high performing schools, school culture, structure and practices did not contribute significantly to the prediction model (table 4.33b). In Oyo state senior secondary schools, table 4.39 revealed that school practices did not significantly predict mathematics self-efficacy.

4.2 Discussion of findings

Relationship between school culture, structure and practices and achievement in Mathematics.

The results show a significant relationship between culture, structure, practices and Mathematics achievement in high and low performing schools. This corroborates the existing literature that shows the existence of a significant relationship between school culture and students' achievement (Almedia, 2003; Blankstein, 2004; Collins, 2004; Clark & Clark, 2003; Gruenert, 1998; Smith, 2006; Zmuda et al. 2004). This finding however negates the findings of Michell (2008), who found that relationship between school culture and achievement was not statistically significant. Also the result revealed that relationship between achievement in mathematics and school structure is statistically significant. This supports the findings of Dike (2007), who revealed that students perform poorly due to inadequate teaching aids, lack of good school environment and infrastructural facilities. It is also in line with the findings of some researchers who support the notion that school principals contribute to maintenance of the status quo and miss opportunities for improving students' educational experience by developing healthy school structure (Leithwood, Jantzi, Earl, Watson, Levin, and Fullan, 2004 and Hoy, Tarter, and Hoy, 2006). The finding is also in line with the work of Bandura (2001)who observed that teaching strategies adopted in the classroom can and do make the difference to pupils' achievement. The result that school practices was statistically significant supports the findings of Bear (2008) and Bowman (2010).Also, the finding corroborates that of Dupper and Meyer-Adams (2002) who discovered that school practices supports better learning.

School Culture: The result shows that school culture was statistically significant in predicting achievement in mathematics. This finding negates the findings of Michell (2008), who found that relationship between school culture and achievement was not statistically significantbut supports the findings of Maslowski, 2001 and Hoy, Tarter and Hoy, 2006) who found that the culture of a school affects student achievement. Findings from the result reveal that student achievement increases when teachers work together in teams in true collaboration (R. DuFour, Eaker, and R. DuFour, 2005). Most importantly, teachers recognise their crucial role in the educational process and know that they can meet the challenges confronting them only by solving problems in concert with their professional

colleagues. The quality of teaching, learning, and relationships in an ideal learning community depends on the quality of leadership provided by the principals and teachers. Getting high quality job performance from teachers depends on the opportunity given to them for personal growth, career development, achievement, responsibility, recognition, reward and involvement in decision making, among others. The result corroborated the works of Rice (2003) that an organisation should recognise the role of human resources in productivity improvement, appreciate the power of a committed and involved work force, and typically devote substantial resources and management energies towards the development of an environment in which employees can contribute to performance improvement to the best of their capacities.

It also corroborates the findings of Bouradas (2005) and Vail (2005), who pointed out that a school leader must inspire staff by expecting and modelling cooperation in achieving the school's objectives. In this regard, researchers have found that successful school principals have a "passion for collaboration" - they make their schools better by actively promoting teamwork, networking, and collaboration through a climate of trust, mutual respect, and a shared belief that high standards can be achieved by both teachers and students. It is further reinforced by a consensus that student achievement increases most when leadership is shared by school teams, parents, and students. In low performing schools, the finding reveals that principals were seen as not providing enough acknowledgement of the teachers' work in either face-to-face interactions or in the community. Normally this would be of concern, because as Vail (2005) has noted, principals should foster positive morale and team spirit by publicising teachers' accomplishments in the community. Despite this apparent shortcoming on the part of the principals in most low performing schools, some participating teachers enjoyed good collegial relations, affective states, and morale. However, the finding that most teachers in low performing schools were seen as being frustrated as a result of the behaviour of administrators and colleagues is surprising. One possible explanation as other research suggests, is that teachers may have become inured to the constraints of a highly centralised, bureaucratic educational system. An alternative explanation is that the education system in Nigeria may no longer be as highly centralised and bureaucratised as it once was.

From the result, it is important to mention that a personalised environment plays a significant role in students' academic achievement and self-efficacy. The teachers in high performing schools in the study usually listen to and respond very promptly to their

students' questions, complaints, opinions and views because they have an established rapport with their students, thereby improving the students' cognitive achievement and boosting their self-efficacy.

School structure: Structure statistically predict achievement in mathematics and the most influential of all the elements of school structure is conducive-environment and school based decision making. This supports the findings of Dike (2007), who revealed that students performed poorly due to inadequate teaching aids, lack of good school environment and infrastructural facilities. It is also in line with the findings of some researchers that school principals contribute to maintenance of the status quo and miss opportunities for improving students' educational experience by developing healthy school structure (Leithwood, Jantzi, Earl, Watson, Levin, and Fullan, 2004 and Hoy, Tarter, and Hoy, 2006). The finding is also in line with the work of Bandura (2001) who observed that teaching strategies used in the classroom can, and do make a difference to pupils' self-efficacy and achievement. It then appears that one's self-efficacy may increase or decrease depending on the learning environment, teaching/learning strategies, curriculum alignment, quality of instruction, etc. The study revealed that the environment in which the school is located/sited has great effect on students' achievement and self-efficacy because students from schools located in a beautiful and serene environment concentrate and perform better than their counterparts from other schools. The findings corroborated the works of Adeyemi (2012), who discovered that location of a school has a significant effect on the behaviour of the child. According to him, pupils tend to be confident and perform better in educationally stimulating environments which are likely to arouse a degree of interest and at the same time increase self-efficacy. It is also pertinent to note that the location of school plays an influential role in the teaching and learning situation. Studies have shown that there is a large achievement gap between rural and urban areas with most rural based schools lacking enough qualified teachers, being poorly equipped with basic amenities and having poor teaching environment, all of which inhibit self-efficacy and good academic performance.

Almost all teachers in high performing schools work with supportive principals who address both their professional and socio-emotional needs and adopt team spirit, showing higher professional commitment. This supports the findings of Sergiovanni, (1990) and Reihl and Sipple, (1996). Teachers in these schools are given the opportunity to contribute

their quota to the development of the school and have this sense of belongingness that energises them to groom the students and give them their best.

The finding that students and teachers in low performing schools are seldom trusted and included in school governance was not entirely unexpected. This has been documented often, for example, by Saitis (2002); Ghaith (2003); Finnan, Schnepel, and anderson, (2003); and Kerr, Ireland, Lopes, Craig, and Cleaver, (2004). Nonetheless, this is a feature that should be investigated and, if possible, rectified. Given the complexities of contemporary schooling, participation in school governance by all stake-holders, including students, has become essential. Furthermore, students and teachers' active involvement in the organisation of school life helps develop their sense of responsibility and appreciation of democracy which are important elements in their preparation for citizenship.

The finding that a condusive learning environment has a positive impact on achievement and self-efficacy was supported by Leithwood and Jantzi, (2009) and Cotton (2001). In their work, they discovered that in a condusive school environment, academic achievement is better and this in turn, raises students' self-efficacy. Furthermore, students' attitude towards school subjects generally is better and gets particularly more positive. Also, students' social behaviour is usually better in a conducive learning environment. Other desirable outcomes such as participation in school extracurricular activities, attendance in school and even student dropouts will be low and these put together would boost self-efficacy.

School practices; this was statistically significant in predicting achievement in mathematics and the most influential are fair, firm and timely discipline, redesigning the organisation and feedback and reinforcement. Fair, firm and timely discipline has an effect on achievement and self-efficacy. This supports the findings of Bear (2008) and Bowman (2010) that when correcting misbehavior, effective educators work hard to avoid using punishment. Instead, they should focus on strategies for developing self-discipline and for preventing misbehaviour. When correcting misbehaviour, school leaders should use mild forms of punishment, such as physical proximity, taking away privileges, verbal reprimands, and ''the evil eye'' rather than using harsh forms of punishment such as suspension. When punishment is used, it must be used fairly, judiciously, in the context of a caring and supportive relationship, and typically in combination with replacement techniques that teach or strengthen desired behaviours. This would include techniques that emphasize social and emotional competencies and positive teacher–student relations, such as joint social problem-

solving and induction, where the focus is on the impact of one's behavior on others. Also, the finding corroborates that of Dupper and Meyer-Adams (2002) who discovered that improved student behaviour supports better learning.

Feedback and reinforcement also have significant effect on achievement in Mathematics and self-efficacy. These results are in consonant with Adewuyi (2002) who confirmed that there is a general belief that feedback as an important component of learning might lead to a change in learners' subsequent behaviour or performances. The result also agrees with Xun and Susan (2003); Jha, Ghosh, and Mehta (2006); and Balogun and Abimbade (2002) who perceive that feedback does promote improved students' learning in any subject. The result also supports the finding of Bandura (2001) that success raises self-efficacy while failure lowers it. Students who perform well in Mathematics tests and earn high grades are likely to develop a strong sense of confidence in their Mathematics capabilities. This strong sense of efficacy helps ensure that such students will enrol in subsequent Mathematics-related classes, approach Mathematics tasks with serenity, and increase their efforts when difficulty arises. On the other hand, low test results and poor grades generally weaken students' confidence in their capabilities. As a result, students with low Mathematics self-efficacy will more likely avoid future Mathematics classes and tasks, and they may approach the area of Mathematics with apprehension.

b Relationship between school culture, structure and practices and self-efficacy

The result was not statistically predicting self-efficacy in high performing schools. The finding supports that of Felsen (1984) who postulated that self-efficacy was not related to culture and negated the findings of James et al (2002) who indicated that teachers' social interactions or networking increases self-efficacy.. Also, the results shows that school culture and structure which statistically predicted self-efficacy in senior secondary schools in Oyo State agreed with the findings of Jink et al (2000) who believed that if given the opportunity for collaboration and schools are provided with good structure, self-efficacy is enhanced. However, it is remarkable to note that if the school environment is personalised, the teacher would be pro-active in demonstrating acceptance, understanding, warmth, closeness, trust, respect, care and cooperation towards his or her students' works and at initiating positive teacher-student relationships as well as increasing the likelihood of building strong relationships that will endure over time. It is noteworthy that highly personalised environment does engender self-efficacy in the student. It is not a gainsay that

teachers who established a personal, close, friendly, warm and supportive relationship with their students create an enabling environment which enable them to learn in a relaxed and tension free atmosphere. It is evident that when students experience a sense of belonging at school and supportive relationships with teachers and classmates, they are motivated to participate actively and appropriately during the teaching/learning process and in other activities in the classroom as well as the school.

Furthermore, self-efficacy is enhanced if learning experiences ascend in difficulty and sequence. If students collaborate and they are given opportunities for small group activities, it will boost their self-efficacy. Also Short and Greer (2002)corroborate the fact that if teachers are provided with professional development, their self-efficacy will increase. Jink et al (2000) states further that teachers can increase self-efficacy if provided opportunities to monitor their students' progress i.e. reflect on, and assess how students perform.

These results are in consonance with Rust (2002) who submits that assessment is an evaluation or appraisal of students' learning outcomes. From the findings, it is evident that in high performing schools, all assessment goes into the working portfolio and teachers have freedom to assess their students at will. In some of the low performing schools however, assessment conducted once or twice in a term may not be marked by most teachers. In the alternative, they could give outrageous continuous assessment score that is added to students' examination result. It is evident from the study that most high performing schools conducted their continuous assessment as often as possible. This supports Onuka (2010) who opined that the main emphasis in continuous assessment is not that evaluation should be done non-stop, but that it should take place as often as possible (at some regular intervals) and not kept until the end of the term or year. Also, all assessment modality prescribed by the school is adhered to by most high performing school teachers.

As evident from the study, feedback and reinforcement significantly predicted self-efficacy and is the most influential of all the elements of school practices. If students are assessed and properly monitored by the school, feedback should be given to the students so as to know their strengths and weaknesses. It is evident from the result that most high performing schools are doing this. After assessment, they give feedback to their students and this gives opportunity to students to correct themselves where necessary and brings about increase in self-efficacy and improvement in their future performance. This corroborates the works of Adewuyi (2002) who confirmed that there is a general belief that feedback as an important

component of learning might lead to a change in learners' subsequent behaviour. Also the result supports the finding of Bandura (2001) that success raises self-efficacy while failure lowers it. If at the end of the term students are rewarded for their brilliant performance or given incentives during lessons, this gears up the weak ones among the students to work harder, while the leading crew will also not relent. This becomes imperative from the finding that most high performing schools give prizes to their best students at the end of the session while some give incentives to their students during teaching/learning processes which in turn raises students' efficacy and improves their performance.

This makes it necessary for teachers to acquire skills in the development of various assessment techniques. Teachers should assess their students at regular intervals so as to ascertain the extent to which the students have learnt or gained from a particular course of instruction and ensure effective monitoring of students' progress. In order to cater for all aspects of learning, there is the need to use several types of assessment tools such as teacher-made tests, standardized tests, oral questions, discussion, projects, direct classroom observations, assignments, questionnaires, interviews and so on. Furthermore, it is pertinent to mention that teachers should acquire necessary skills in the development of assessment tools. In addition, it is paramount that students should be adequately informed of the importance of exposure to various assessment techniques in order to raise their self-efficacy and engender improved performances.

Finally, training on the development and implementation of various assessment techniques and the importance of feedback and reinforcement should be made known to enhance a high level of competency in the use of various assessment techniques. Students should be encouraged to learn from their past successes or achievements and see successful people as role models in order to boost their self-efficacy. Also it is important for teachers to reinforce their students in order to encourage them

CHAPTER FIVE

SUMMARY OF FINDINGS, IMPLICATIONS, RECOMMENDATION, CONCLUSION AND SUGGESTION FOR FURTHER STUDIES

5.0 Introduction.

This chapter presents the summary of the findings in chapter four; their educational implications, conclusion and recommendation as well as suggestions for further studies. Also presented in this chapter are the limitations of the study.

5.1 Summary of findings

The study examined the relationship that exists between school culture, school structure and practices of high and low performing schools in Mathematics and achievement and self-efficacy in Mathematics. The rationale for the study was to determine the extent to which school culture, structure and practices affect students' achievement in Mathematics and their Mathematics self-efficacy.

A total of one thousand two hundred students and one hundred and sixty teachers constituted the sample population for the study. Literature was reviewed on the variables and it was discovered that school culture, structure and practices determined achievement and self-efficacy. The study was a survey, four developed and one adopted instrument validated by the researcher was used to gather information from the sample.

Data obtained was analysed using multiple regression and T-test. The research result is presented and summarized as follows:

(i) There is a distinct difference between the level of self-efficacy and achievement in high and low performing schools in Mathematics.

(ii) The obtained regression equation resulting from a set of three predictor variables (school culture, structure and practices) allowed a prediction of achievement and self-efficacy in Mathematics in high and low performing schools.

(iii) The predictor variables that is most influential in predicting achievement in high performing school in Mathematics is the school structure.

(iv) The predictor variables that predict achievement most in low performing schools are the school culture and structure.

(iv) The predictor variable that predicts self-efficacy most in low performing schools is the school culture.

(v) The predictor variables that predicted achievement and self-efficacy most in Senior Secondary Schools in Oyo State are school culture and school structure.

(vi) The predictor variables that are not contributing significantly to the prediction model of achievement in high performing schools are school culture and school practices

(vii) The predictor variable that is not contributing significantly to the prediction model of achievement in low performing schools is school practices.

(viii) The predictor variables that are not contributing significantly to mathematics self-efficacy prediction model in high performing schools are school culture, school structure and school practices.

(ix) The predictor variables that are not contributing significantly to mathematics self-efficacy prediction model in low performing schools are school structure and school practices.

(x) The predictor variable that did not contribute significantly to achievement and self-efficacy prediction model in senior secondary schools in Oyo State is the school practices.

5.2 Conclusion

The type of culture that a school operates is one of the determinants of its achievement. Also, the school plans should be known by schools managers and should be properly implemented. Lastly, giving teachers free hand to operate encourages innovations. It can be concluded that the predictor variables (schools culture, structure and practices) are effective in improving academic achievement in all subjects, most especially Mathematics, which most students have phobia for and they are capable of raising students' self-efficacy. This study/investigation has generated baseline data about school culture, structure and practices of schools.

5.3 Educational implications

Findings in this study have implications for teachers, students, parents/guardian, school managers and educational evaluators.

One implication of these findings is that it may be beneficial in Nigeria to accord schools a greater measure of professional autonomy, and at the same time, devote more resources to educating prospective school managers/administrators/principals about the potentials of their role and the contributions they could make to their students and staff's lives as well as to the development of the education sector. Also, it might help principals to value the spirit of cooperation and collaboration in the school and within the community, preferring empowerment over policing, and preferring development over maintenance. In terms of Capacity Building/Training of the contemporary Principal, it would enable principals to identify training on leadership as a priority. Lastly it will enable School Managers/Principals ensure the implementation of the best out of the three types of school culture exposed by this work, ensure active involvement of teachers and students' in decision making, create a conducive environment for learning, send teachers on training programmmes, organise workshops/seminars, reinforce staff/students, create time for extra-curricular activities, encourage innovations and enforce discipline in their various schools.

Teachers

The findings of this study have shown that professional development and working in collaboration with colleagues could have positive impact on skills acquisition of teachers of Mathematics. Regular training and re-training programmes for teachers in schools should provide a basis for their own personal improvement with regards to knowledge in Mathematics and by extension, improvement on the performance of their pupils. Also, giving feedback and reinforcing the students could bring a positive change to learning. Active participation of teachers in decision making boosts their self- efficacy and improves performance. Working in a conducive environment also could have positive effect on teaching/learning as well as achievement and self-efficacy. Monitoring students' progress, redesigning the organisation and implementation of continuum classes will show the level of commitment of the teacher, increase performance and boost efficacy.

Students

If schools practice positive school culture, it will encourage active participation of students in the school programme and enhance cordial relationship among all the stakeholders. The elements of school structure and practices should be made available in schools to raise students' self-efficacy and improve their performance.

Parents/guardians

The result of this study is an eye opener for parents to see the role they are expected to play in the promotion of positive school culture in schools, and ensure that they contribute their own quota to the development of schools by giving necessary assistance to their wards in order to ensure attainment of the school mission and vision.

School managers and educational evaluators.

The outcome of this study should encourage school managers and educational evaluators to promote positive school culture and ensure that all the elements of school structure and practices are included in the schools system. They should create conducive environment for schools and promote judicious use of time in schools. Apart from creating a conducive environment, all other things under school structure if planned for, will enhance achievement and boost self-efficacy. Also teachers should be encouraged to be innovative.

Managers should organise and allow teachers of Mathematics to attend in-service training to assist teachers develop higher professional skills in the teaching and learning process. Also there should be provision for educational learning facilities and resources, including well -equipped libraries and cybercafés that will give students and teachers access to books and the internet.

5.4 Recommendations

- Enlightenment programmes should be organised on what should constitute the school culture, structure and practices to improve self-efficacy and achievement in Mathematics.
- There should be regular training and re-training programmes for teachers in schools so as to provide a basis for their own personal improvement with regards to knowledge in their areas of study and, by extension, improvement on the performances of their pupils.

- Investigation of teachers' level of professionalism from time to time is encouraged as it will help to determine where they need to be strengthened (Needs Assessment) and thus identify ways of improving teachers' training and capacity building programmes.
- It is recommended that funds should be made available in schools for easy execution of school plans.
- Orientation programmes should be organised for school managers on the types of school culture that exist.
- School managers should ensure they cater for all the elements of school structure.
- Teachers should be encouraged to be innovative.
- Conducive environment should be made available to sustain any educational programmes in the country.
- Teachers should make judicious use of the school time and see the importance of implementing continuum classes.
- The findings concerning school managers/administrators also suggest that more academic training programmes need to be developed in schools.
- Teachers should be given room to redesign the school curriculum in order to improve performance and enhance self-efficacy.
- School planners should create room for extra-curricular activities.
- School managers and teachers should ensure personalisation of the learning environment.
- Teachers should be well remunerated in order to ensure they are well motivated.
- Schools should give prizes to their best students so as to motivate them.

Consequent upon this result, efforts should be made by school administrators/managers to put in place a good structure, operating a positive culture and implementing better practices. This will help their students attain greater heights and boost their self-efficacy, most especially in low performing schools.

5.5 Limitation

The study was limited to Oyo state senior secondary schools. The variables used were restricted to school culture (collaborative leadership, teacher collaboration, professional development, unity of purpose, collegial support and learning partnership),

structure (conducive-environment, personalised environment, monitoring students' progress, implementing continuum classes and extra-curricular activities) and practices (developing people, discipline, allocation of time and space and redesigning the organisation).

5.6 Suggestion for Further Studies

There is a need to replicate this research in other parts of the country in order to give greater opportunity for generalisation. Since there is dearth of literature on school structure and practices, more research should be embarked upon in other subject areas to add to the existing literature and the work can be repeated in other parts of the country. There is also the need to include more variables (apart from the ones used in this study) in further studies to look at their predictions of achievements and self-efficacy. It is also possible to restructure this study and make it experimental.

Further investigation of teachers' professionalism may be fruitful in determining whether certain dimensions of their profession might need strengthening and thus identify ways of improving how they are trained and certificated.

In addition, investigations need to be conducted, perhaps paralleling this one initially but also looking at different aspects and effects of school culture, structure and practices, in a variety of situations using a variety of research approaches and instruments. Such investigations could contribute significantly to the improvement of schools in Nigeria.

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APPENDIX I

INTERNATIONAL CENTRE FOR EDUCATIONAL EVALUATION (ICEE)

UNIVERSITY OF IBADAN

SCHOOL STRUCTURE SCALE (SSS)

Introduction

The researcher is interested in examining the extent to which school structure could determine student academic achievement and self-efficacy. Please supply your response with all sincerity. The information will be used mainly for research and confidentiality is hereby guaranteed.

SECTION A: BIO DATA

School:…… Respondent Age: ……

Year of Service at the current school: ……....

Gender: Male ( ) Female ( )

SECTION B

Instruction: Kindly put (√) at the appropriate place you feel it is suitable to indicate the extent to which you agree with the statement

S/N	SCHOOL STRCTURE ITEMS	Rarely	Sometimes	Often	Very frequently
	Conducive Environment				
1	The school management ensures that the school environment is neat and tidy				
2	Management ensure that the classrooms are well ventilated and illuminated				

3	The numbers of students in a class ranges from 25-40.				
4	The school environment is safe and orderly.				
5	The school environment looks beautiful.				
6	School ensures maintenance of the writing boards				
7	Adequate chairs and lockers are in the classrooms				
8	Students utilise the school laboratory.				
9	Materials needed for teaching /learning are put in place by the management				
10	School management maintain the school building/classrooms				
11	Students/Teachers utilises the school library				
12	Important text books needed for teaching and learning can be found in the school library				
	Personalised Environment				
13	Teachers relate with students outside the physical school building				
14	Teachers influence students outside the school				
15	Teachers are familiar with student's learning style				
16	Teachers are familiar with student's interest and background				

17	Students are given responsibilities				
18	Students are spoken to honestly				
19	Students are treated with dignity and respect				
	School Based Decision Making				
20	Different committees are put in place				
21	Schools prefer committee based decision making				
22	Students have input in school decision				
23	Parents/community have input in school decisions				
24	Parents are members of governing board				
25	Principals determines who constitutes the planning committees				
26	The teachers and the principal determines who constitute committee				
	Monitoring Student Progress				
27	All assessment is recorded				
28	School schedules a time for general test				
29	Teacher conducts test at will				
30	School authority determines what constitutes the continuous assessment				
31	School organises quiz and debate				

32	Prizes are given to best students in quiz and debate				
33	The principal/HOD's collect students note randomly.				
34	School ensures that each teacher covers the curriculum.				
35	School invites parents of weak student for deliberation				
36	School has student promotion committee				
	Implementing Continuum Classes				
37	Students remain with the same class teacher from SS1-SS3				
38	Same teacher teaches a subject from SS1–SS3				
39	Teacher fixes/organises extra class for students to deal with complex topic				
40	Extension classes are arranged for students during the holiday to cover the curriculum				
41	Teachers have opportunity to teach complex topics after the school period.				
	Extracurricular Activities				
42	School puts in place sport teams				
43	School has student government				
44	School organises clubs (barbing, bakers,				

	farmers, bricklaying, hairdressing etc.)				
45	School devotes special time for talks, Quiz and debate				

APPENDIX II

INTERNATIONAL CENTRE FOR EDUCATIONAL EVALUATION (ICEE)

UNIVERSITY OF IBADAN

SCHOOL CULTURE SCALE (SCS)

Introduction,

The researcher is interested in collection of information concerning your School Culture. Please supply your response with all sincerity, the information will be used for research purpose.

SECTION A: BIO DATA

School Location: ……

Age of Respondent: ……

Year of Service at the current school: ……

Gender:……

SECTION B

Instruction;- ***To what degree do these statements describe the conditions at your school? Kindly put (∨) at the appropriate place you feel it is suitable.***

Rate each statement on the following scale: **1= not at all 2= once in a while 3= sometimes 4=fairly often 5= always**

S/N	ITEMS	1	2	3	4	5
	Collaborative Leadership					
1	Leaders value teachers' ideas.					

2	Leaders in this school trust the professional judgments of the teacher.					
3	Leaders take time to praise teachers that perform well.					
4	Teachers are involved in the decision-making process.					
5	Leaders in our school facilitate teachers working together.					
6	Teachers are kept informed on current issues in the school.					
7	Teachers' suggestion in policy or decision making is taken					
8	Teachers are rewarded for experimenting with new ideas					
9	Leaders support risk-taking and innovation in teaching.					
10	Administrators protect instruction and planning time.					
11	Teachers are encouraged to share ideas.					
	Teacher Collaboration					
12	Teachers have opportunities for dialogue and planning.					
13	Teachers spend considerable time planning together.					
14	Teachers take time to observe each other teaching.					
15	Teachers are generally aware of what other teachers are doing.					
16	Teachers work together to develop and evaluate programmes.					

17	Teaching practice disagreements are voiced openly.					
	Professional Development					
18	Teachers utilize professional networks to obtain information and resources for classroom instruction.					
19	Teachers regularly seek ideas from colleagues and seminars.					
20	School sends staffs to workshops/seminars.					
21	Teachers personally update their knowledge.					
22	The school values staff improvement.					
	Unity of Purpose					
23	Teachers support the goals of the school.					
24	The school objectives provide a clear sense of direction.					
25	Teachers understand the mission of the school.					
26	The school mission statement reflects the values of the school.					
27	Performance of students reflects the achievement of mission of the school.					
	Collegial Support					
28	Teachers trust each other.					
29	Teachers are willing to help out whenever there is a problem.					
30	Teachers' ideas are valued by other teachers.					

31	Teachers work cooperatively in groups.					
	Learning Partnership					
32	Teachers and parents have common expectations for students.					
33	Parents trust teachers' professional judgments.					
34	Teachers and parents communicate frequently about students.					
35	Students generally accept responsibility; they engage mentally in class and complete assignments.					

APPENDIX III

INTERNATIONAL CENTRE FOR EDUCATIONAL EVALUATION (ICEE)

UNIVERSITY OF IBADAN

SCHOOL PRACTICES QUESTIONNAIRE (SPQ).

Introduction

The researcher is interested in examining the extent to which school practices could determine student academic achievement and self-efficacy. Please supply your response with all sincerity. The information will be used mainly for research and confidentiality is hereby guaranteed.

SECTION A: BIO DATA

School: …… Respondent Age: ……..

Year of Service at the current school:……....

Gender: Male ( ) Female ( )

SECTION B:

Instruction; Kindly put (√) at the appropriate place you feel it is suitable to indicate the extent to which you agree with the statement

S/N	**SCHOOL PRACTICES (ITEMS)**	Rarely	Sometimes	Often	Very frequently
	Developing people				
1	Teachers were given opportunity to attend workshops/conferences.				
2	School organises workshops/training for their				

	teachers.				
3	School sponsor teachers to seminars/conferences				
4	School organises talks/workshop for the students.				
5	There is extensive professional development based on assessment of needs.				
6	Students are encouraged to use the library				
	Discipline				
7	School puts in place disciplinary committee.				
8	School defines acceptable behaviour.				
9	Punishment attached to unacceptable behaviour is defined.				
10	Punishment of any misbehaviour is administered consistently and with respect for due process.				
	Allocation of time and space				
11	Teachers create time for planning together.				
12	Teachers create time to discuss students work.				
13	Teachers' have time to shares lesson plan.				
14	Special time is allocated to core subjects.				
15	There is room for extension of class period to tackle complex/broad topics.				

16	School allows after school tutoring.				
	Feedback and reinforcement				
17	The school authority gives prizes to best students at the end of the session.				
18	Principal meet the class representatives to discuss teachers' performance.				
19	Teachers give prizes to their best students at the end of the term.				
20	Teachers were encouraged to reinforce their students.				
21	Teachers mark students' assignment, test and project and return their script.				
22	PTA gives prizes to outstanding students at the end of the session.				
23	Outstanding teachers are rewarded at the end of the session.				
24	Subject teachers give prizes to their best students.				
	Redesigning the organisation				
25	School encourages innovative grouping approach (peer-tutoring, cooperative learning).				
26	Teachers re-arrange the curriculum to enhance better performance.				
27	Students are given to teachers for tutoring.				

28	School design special scheme of work to suit their students.				
29	Teachers from other subject area can be co-opted to teach difficult topics.				

APPENDIX IV

INTERNATIONAL CENTRE FOR EDUCATIONAL EVALUATION (ICEE)

UNIVERSITY OF IBADAN

MATHEMATICS SELF EFFICASY SCALE (MASES)

Introduction,

Dear respondent please supply all the information with all sincerity. The researcher wants to use the information mainly for research.

SECTION A: BIO DATA

***Name*: ……..**

***School:* ……**

Class; Science ( ) Commercial ( ) Arts ( )

Gender: Male ( ) Female ( )

SECTION B; Kindly put (√) at the appropriate place you feel it is suitable; please supply your response with all sincerity.

S/N	QUESTIONNAIRE ITEM	Not true of me	Fairly true of me	True of me	Always true of me
1.	I am capable of dealing with any math's problems in my class.				
2.	Even if any math's topic is difficult, I can learn it.				
3.	I don't give up easily.				
4.	I enjoy math's class activities.				
5.	I am a self-reliant person.				
6.	I can always manage to solve difficult problems if I try harder.				

7.	Failures make me try harder.				
8.	I keep on trying new topics when they look too difficult to me.				
9.	It is easy for me to stick to my aims and accomplish my goals academically.				
10.	I feel secure about my ability to do things.				
11.	I am confident that I could deal with unexpected problems in mathematics.				
12.	I can solve most problems if I invest the necessary effort.				
13.	I am not afraid of any mathematically based problems.				
14.	I can remain calm when facing difficulties, because I can rely on my coping abilities.				
15.	When I am confronted with a problem, I usually find several solutions.				
16.	If I can't tackle any mathematics exercise the first time, I keep trying.				
17.	When I have an unpleasant assignment, I stick with it until I finish it.				
18.	I am always comfortable when solving Mathematical problems				
19	I prefer doing Mathematics than any other subjects				

20	Irrespective of how difficult mathematics problems are, I keep on trying them				
21	I don't take time to check my workings to find and correct error				
22	I enjoy solving any mathematical related problem				
23	I get a sense of satisfaction when I solve Mathematics problem				
24	I find every mathematical problem interesting.				
25	I am always eager to learn new things in Mathematics				
26	I like solving Mathematics problem without assistance				
27	I have less problem learning Mathematics than other subjects				
28	I know I can handle any difficulty in Mathematics				
29	I am confident with Mathematics				
30	I have a mathematical mind				
31	Having to learn difficult topics in math's does not worry me				
32	It's pleasant solving new Mathematics problem				
33	I can never fail mathematics				
34	Being a mathematician is prestigious				
35	Mathematics is a subject in which I get value for effort				
36	I don't understand how some people seem to enjoy spending so much time on math's problem				

37	I can get good results in Mathematics				
38	I am always excited in Mathematics class				
39	I find many mathematics problem challenging				
40	Studying Mathematics make me comfortable				

APPENDIX V

MATHEMATICS ACHIEVEMENT TEST (MAT)

Instruction: Answer all the questions Time: 1 Hour

Use the following for question 1 to 3:

A group of students took a test and the following frequency table shows the scores:

Score	0	1	2	3	4	5
Frequency	2	3	4	2	7	2

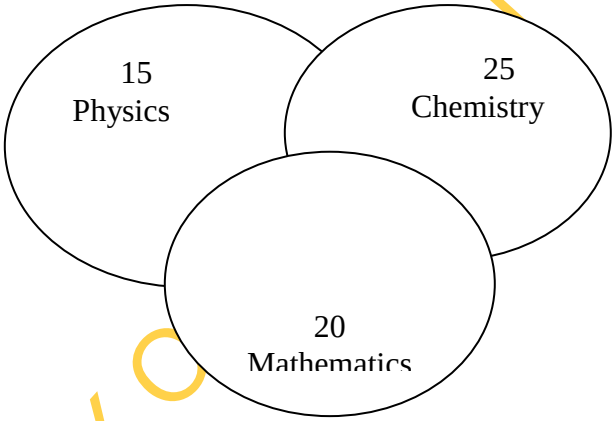
1. Find the mode (a) 2 (b) 3 (c) 4 (d) 5 (e) 7
2. Find the mean score. (a) 1.75 (b) 2 (c) 2.5 (d) 2.75 (e) 3
3. The median score is (a) 0 (b) 2.5 (c) 3 (d) 5 (e) 7.
4. If Cos 60^0 =1/2 which of the following angles has a cosine of ½? (a) 30^0 (b) 120^0 (c) 150^0 (d) 210^0 (e) 300^0 .
5. A ladder 9m long leans against a vertical wall, making an angle of 64^0 with the horizontal ground. Calculate, correct to one decimal place, how far the foot of the ladder is from the wall. (a) 4.0m (b) 5.8m (c) 7.1m (d) 8.1m (e) 18.5.
6. What is the difference in longitude between P (lat. 50^0N, long. 50^0W) and Q (lat50^0N, long.150^0W)? (a) 300^0 (b) 200^0 (c) 130^0 (d) 100^0 (e) 30^0
7. What is the bearing of Q from P to the nearest whole degree? (a) 16^0 (b) 17^0 (c)73^0 (d) 106^0 (e)164^0
8. If sinθ=3/5 find tanθ for $\theta < 90^0$ (a) ⅘ (b) ¾ (c) ⅝ (d) ½ (e)⅜
9. Find the quadratic whose roots are x = -2 or x=7 (a) x^2 +2x-7=0 (b) x^2-2x+7=0 (c) x^2 + 5x + 14=0 (d) x^2 -5x – 14=0 (e) x^2 + 5x-14=0
10. What is the probability of having an odd number in a single toss of a fair dice? (a)$^1/_6$ (b)$^1/_3$ (c)$^1/_2$ (d)$^2/_3$ (e)$^5/_6$
11. Evaluate $\log_{10}{}^6 + \log_{10}{}^{45} - \log_{10}{}^{27}$ without using logarithm tables (a)o (b) 1 (C) 1.1738 (d) 1.3802 (e) 10
12. Find the root of the equation $2x^2$-3x-2 =0 (a) x=- 2or $1^1/_2$ (b)x=-2 or 1 (c) x=2 or 2 (d) x=1 or 2 (e) x=- $^1/_2$ or 2

13. P and Q are two places on the same circle of latitude 79^0S. P is on longitude 68^0E, while Q is on longitude $22^{0W.}$ The angular distance between P and Q is (a) 12^0 (b) 45^0 (c) 48^0 (d) 90^0 (e) 92^0

14. Factorise the following expression : $2x^2+x-15$ (a) (2x+5)(x-3) (b) (2x-5)(x+3) (c) (2x-5)(x-3) (d)(2x-3)(x+5) (e) (2x+5)(x+3)

15. The angle of elevation of X from Y is30^0.if XY=40m, how high is X above the level of Y? (a) 10m (b) 20m (c)20$\sqrt{}$ 3m (d)40m (e)50m

16. The venn diagram shows the number of students who study physics, chemistry, and Mathematics in a certain school. How many students take at least two of the three subjects? (a) 165^0 (b) 160^0 (c)155^0 (d)135^0 (e) 85^0



17. An arc of a circle radius 7cm is 14cm long. what angle does the arc subtend at the centre of the circle?(take$\prod=^{22}/_7$ (a) 25.7^0 (b) 44^0 (c) 51.43^0 (d)98^0 (e)114.5^0

18. If 5 times a certain integer is subtracted from twice the square of the integer, the result is 63. Find the integer. (a)21 (b)9 (c)7 (d) 4 (e) 3

19. If 3^y =243, find the value of y. (a) 2 (b) 3 (c) 4 (d) 5 (e) 6.

20. Points X and Y are respectively 20km North and 9km East of a point O. what is the bearing of Y from X correct to the nearest degree? (a)024^0 (B)114^0 (C)156^0 (D)204^0 (e)336^0

21. Calculate the surface area of a hollow cylinder which is closed at one end, if the base radius is 3.5cm and the height 8cm. (Take $\prod=^{22}/_7$) (a) $126.5cm^2$ (b)$165cm^2$ (c)$176cm^2$ (d)$2145cm^2$ (e)$253.5cm^2$

22. Solve the following equation :$6x^2-7x-5=0$ (a)$x=^1/_2$ or $x=-2^1/_2$ (b) $x=^1/_3$ or X $=-2^1/_2$ (c) $x=1^2/_3$ Or $x=-1/2$ (d) $x=-1^2/_3$ or $x=^1/_2$ (e)$x=^5/_6$ or $x=-1$

23. If A= (a,b, c), B = (a, b, c, d, e), C = (a, b, c, d, e, f), find (A U B) (A U C). (a) (a ,b , c, d) (b) (a, b, c, d, e) (c) (a, b, c, d, e, f) (d) (a, b, c) (e) O.

24. Find the volume of a cone of radius 3.5cm and vertical height 12cm.(take $\prod=^{22}/_7$) (a)$3.4cm^3$ (b)$15.5cm^3$ (c)$21.0cm^3$ (d)$42.0cm^3$ (e)$154.0cm^3$

25. The angle of a sector of a circle of diameter 8cm is 135^0. Find the area of the sector. (take $\prod=^{22}/_7$) (a)$9^3/7cm^2$ (b) $12^4/_7cm^2$ (c) $18^5/_7cm^2$ (d)$25^1/_7$ (e)$31^3/_7cm^2$

26. If $\log_a x = p$, express x in term of a and p (a) x=u + p (b) $x=^a/_p$ (c) x=p (d) x=ap (e)x=a

27. What is the probability that 3 customers waiting in bank will be served in the sequence of their arrival at the bank (a) $^1/_6$ (b) $^1/_3$ (c) $^1/_2$ (d) $^2/_3$ (e)$^5/_6$

28. In an A.P, the first term is 2, and the sum of the 1st and 6th terms is $16^1/_2$. What is the 4th term? (a) 12 (b) $9^1/_2$ (c)8 (d)7 (e)$5^1/_2$

29. Simplify $125^{-1/3} \times 49^{-1/2} \times 10^0$ (a)350 (b)35 (c)$^1/_{35}$ (d)$^1/_{350}$ (e)0

30. If $3^{2x}=27$, what is x? (a)1 (b)1.5 (c)4.5 (d)18 (e)40.5

31. Find the 4th term of an A.P whose first term is 2 and common difference is 0.5 (a) 0.5 (b) 2.5 (c) 3.5 (d) 0.4 (e) 4.5

32. Solve the equation $2a^2-3a-27=0$ (a) $^3/_2$,9 (b) $^{-2}/_3$,9 (c)3,$^9/_2$ (d)-3,-$^9/_2$ (e) -3,$^9/_2$

33. A sector of a circle of radius 7cm has an area of $44cm^2$.calculate the angle of the sector, correct to the nearest degree. (a)6^0 (b)26^0 (c)52^0 (d)103^0 (e)206^0

Use the following information to answer Question 28 (take $=^{22}/_7$)a cylindrical container, closed at both ends , has a radius of 7cm and height 5cm.

34. Find the total surface area of a cylindrical container, closed at both ends , with a radius of 7cm and height 5cm. (a) $35cm^2$(b) $154cm^2$ (c) $220cm^2$ (d) $528cm^2$ (e) $770cm^2$

35. Simply : $\log_{10} 6 + \log_{10} 2 - \log_{10} 12$ (a)-4 (b)-1 (c) 0 (d) 1 (e) 4

36. Find the number whose logarithm to base 10 is 2.6025 (a) 400.4 (b) 0.4004 (c) 0.04004 (d) 0.004004 (e) 0.0004004

37. A cylinder of base radius 4cm is opened at one end. If the ratio of the area of its base to that of is curved surface is 1:4 calculate the height of the cylinder. (a) 1cm (b) 2cm (c) 4cm (d)8cm (e)16cm.

38. A car is travelling at an average speed of 80km/hr. Its speed in meters per second (m/s) is (a) 13.3m/s (b) 22.2m/s (c) 133.3m/s (d) 222.2m/s (e) 1333.3m/s

39. The common ratio of a G.P is 2. If the 5^{th} term is greater than the 1^{st} term by 45, find the 5^{th} term. (a) 3 (b) 6 (c) 45 (d) 48 (e) 90.

40. In a class of 80 students, every student had to study Economics or Geography or both Economics and Geography. If 65 students studied Economics and 50 studied Geography, how many studied both subjects? (a) 15 (b) 30 (c) 35 (d) 45 (e) 50

APPENDIX VI

School Culture Scale (SCS) Psychometric Properties

The School Culture Scale was adapted from Mitchell (2008). The SCS was developed by analysing 632 useable teacher-response surveys from 27 schools at the Missouri Center for School Improvement's Project ASSIST (Achieving Successes through School Improvement Site Teams). The SCS is a 35-item, likert-type description questionnaire with the likert-type scale ranging from 1 (just well) to 5 (excellently well). The six elements the scale measures correlate with the question number on the SCS illustrated below.

Six Elements	Item number on the SCS	cronbach α
Collaborative Leadership	1-11	.911
Teacher Collaboration	12-17	.836
Professional Development	18-22	.821
Unity of Purpose	23-27	.867
Collegial Support	28-31	.796
Learning Partnership	32-35	.658

To establish reliability for the SCS in the study, Cronbach's alpha was used and the reliability coefficient for all six sub scales of the SCS appears below.

Reliability of the School Culture Survey (SCS)

Subscales	Cronbach's alpha	N
Collaborative Leadership	α = .851	11
Teacher Collaboration	α = .623	6
Professional Development	α = .746	5

Unity of Purpose	α = .711	5
Collegial Support	α = .654	4
Learning Partnership	α = .818	4

APPENDIX VII

SCHOOL STRUCTURE AND PRACTICES SCALE PSYCHOMETRIC PROPERTIES

There are 45 items on the scale and the questionnaire has 6 sub-scale

	Subscales	Items	Cronbach α
1	Conducive Environment	(1-12)	.948
2	Personalised Environment	(13-19)	.929
3	School Based Decision Making	(20-26)	.811
4	Monitoring student's progress	(27-36)	.910
5	Implementing Continuum Classes	(37-41)	.671
6	Extracurricular Activities	(42-45)	.607

SCHOOL PRACTICES QUESTIONNAIRE

The questionnaire consisted 29 items with 5 sub-scales

	Subscale	Items	cronbach α
1	Developing People	(1-6)	.889
2	Firm, Fair, and Timely Discipline	(7-10)	.810
3	Allocation of Time and Space	(11-16)	.876
4	Feedback and Reinforcement	(17-24)	.888
5	Redesigning the Organisation	(25-29)	.826