African Journal of
Education and Practice
(AJEP)

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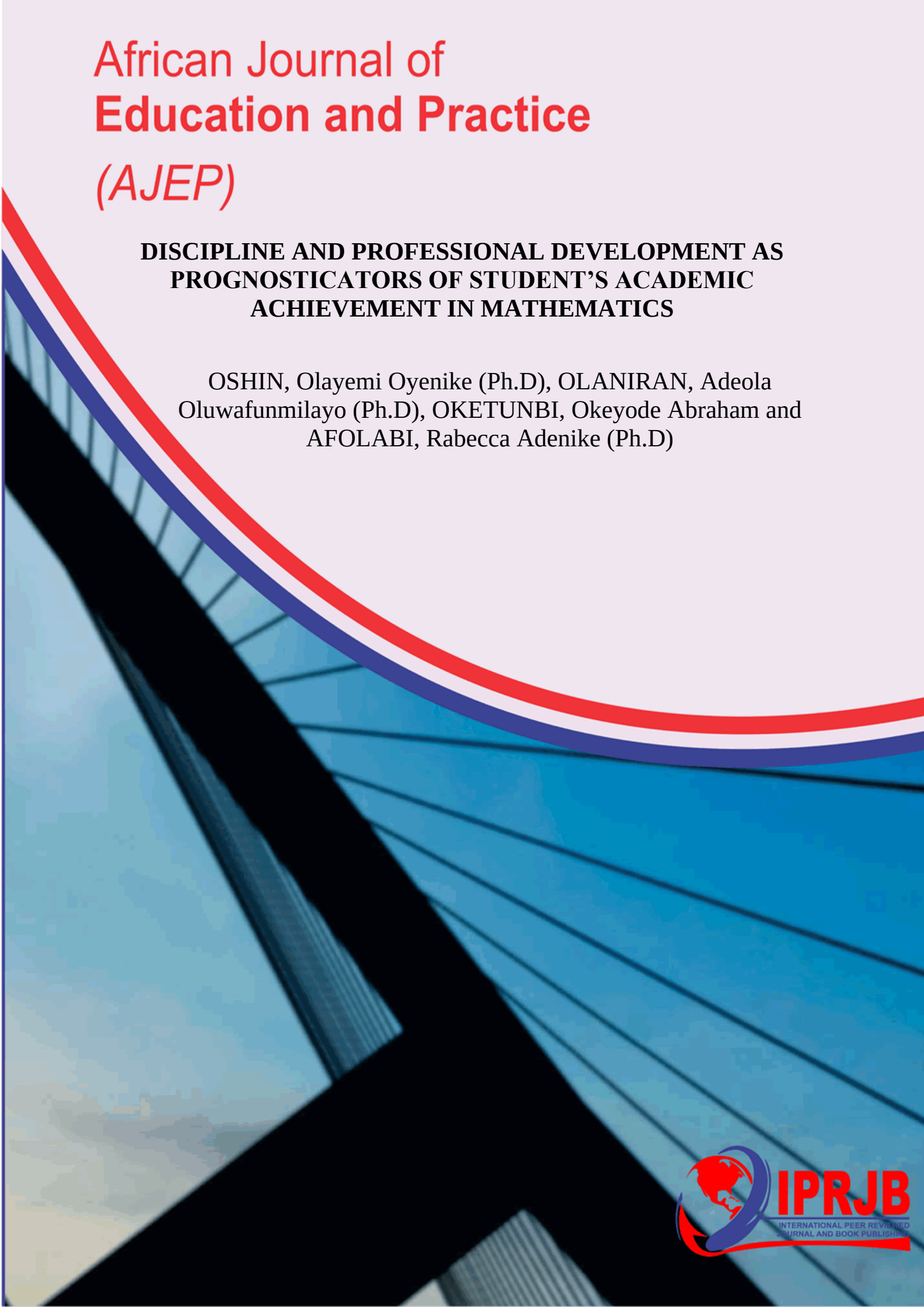

IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING

African Journal of Education and Practice
ISSN 2519-0296 (Online)
Vol.8, Issue 3, No.4, pp 50-68, 2022

DISCIPLINE AND PROFESSIONAL DEVELOPMENT AS PROGNOSTICATORS OF STUDENT'S ACADEMIC ACHIEVEMENT IN MATHEMATICS

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SPONSORED BY TERTIARY EDUCATION TRUST FUND (TETFund)

ABSTRACT

Purpose: Underperformance of secondary school students in Mathematics is a great concern to all stakeholders in education sector. Efforts have been made by many researchers to arrest this situation, but it seems unresolved. Therefore, this study examined discipline and professional development as prognosticators of student's academic achievement in mathematics. The study was led by four hypotheses and relevant literatures were reviewed.

Methodology: Survey research design was used, and the population comprised all secondary schools in South-West Nigeria. Multistage sampling technique was employed: Simple random sampling technique was used to select three (3) out of the six (6) states in South-West, five (5) Local Government Area (LGA) from each state and from each LGA ten (10) schools and 10 students from each school was selected. In all 3 states, 15 LGA, 150 schools and 1500 students were used. Also, purposive sampling method was used to select two (2) teachers of Mathematics from each school. Thus, a total of three hundred (300) teachers of Mathematics were used for the study. Data collection was done by using Discipline and Professional Development Questionnaire (DPDQ) and Mathematics Achievement Test(MAT) with reliability coefficients of 0.82 and 0.86 respectively and content and face validity of the instruments was established by expert in test construction.

Findings: The findings clearly revealed discipline and professional development as prognosticators of secondary school students'achievement in mathematics. It can be concluded that the two predictor variables are effective in improving students'academic achievement in Mathematics.

Unique contribution to theory, practice and policy: This investigation has generated baseline data about the importance of discipline and professional development in schools. It was recommended that eenlightenment programmes should be organized on what should constitute the disciplinary measures to take in schools to improve students' achievement in Mathematics. When correcting misbehaviour educators should focus on strategies for developing self-discipline and for preventing misbehaviour. 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 students. A relevant theory is the Glasser Theory of Classroom Management is based on the principles that the classroom environment and curriculum should create a safe place for learning by meeting the needs for belonging, power, fun and freedom (William 2009) . Glasser also stressed helping the students achieve success by teaching them to make appropriate behavioural choices. According to Glasser, behaviour is a matter of choice. A student's behaviour stems from the choices he or she makes. It's the teacher's responsibility to help the students make good choices, which would result in good behaviour.The Glasser Theory states that teachers should stress student responsibility, establish rules that lead to success, accept no excuses, call for value judgments, suggest suitable alternatives, invoke responsible consequences, be persistent, and carry out continual review. The benefit Glasser believed that students will have is that they will be provided with a choice in deciding the curriculum and classroom rules. This will help the students take ownership of the learning process, leading to increased enthusiasm, confidence and participation.

Teachers employing the Glasser Theory may need to deviate from the classical classroom structure in order to achieve success. Glasser favours having the students work together in small groups. This fosters a sense of belonging, motivates the students to work for the group, and reduces theirdependence on the teacher. When divided into smaller groups, stronger students will help the weaker students, improving relationships and classroom harmony.The Glasser Theory alone won't eliminate all classroom behavioural problems however. Glasser suggests that the teacher organizes the classroom the best way possible to meet students' needs and then intervene with the supplied strategies to improve behaviour (William, 2009). Even when the theory is followed, Glasser concedes up to 25 percent of students may remain unproductive. This theory therefore cannot be the best for this study. Kohn's theory of classroom management emphasises curiosity and cooperation above all else. This is true throughout Kohn's discussions on standards, standardized testing, homework, and classroom management. Kohn believes that the students' curiosity should govern what is taught inside the classroom

Key Word: *Achievement in Mathematics, Discipline, Professional development*

INTRODUCTION

Discipline is a system of guiding an individual to make a reasonable and responsible decision. It is a training a person in orderliness, good conduct and the habit of getting the best out of individuals. In teaching and learning process discipline means the control of class to achieve desired goals. Professional development is the set of training, resources and tools for educators to improve their teaching quality and efficiency. These training or resources allow instructors to further their knowledge in their subject area and allows for mentorship and the opportunity to learn new teaching techniques. Those who take part in seminars, workshops or leadership sessions develop and enhance specialized skills including qualitative, technical and analytical skills. Professional development refers to instructors developing and improving their skills to better meet the needs of their learners. Approaches to professional development include reviewing case studies, mentoring, coaching, consultation and technical assistance.

In Tanzania education curriculum, mathematics is a core subject that every student is studying at both primary and ordinary secondary education (ETP, 1995). In spite of being the core and compulsory subject, student's performance in Mathematics in Tanzania had been low for number of years in Certificate of Secondary Education Examinations (CSEE) (Kita, 2004, Mlozi, Kaguo & Nyamba, 2013, URT, 2008 and SEDP, 2004). According to (URT, 2008) large number of students fail to pass mathematics exams with required grades as the report indicated that national form four examination results in 2004, 2005 and 2006 failures in Mathematics were, 70%, 77% and 76% respectively. Report by HakiElimu (2013) identified general performance of the year 2009 that about 27.5% of the students scored division zero, in the year 2010 failure increased to 49.6%, in the year 2011 failure was 46.4% and 60.5% in the year 2012. It was not indicated in the report that students performed better in mathematics.

It is a known fact in Nigeria for students to further their studies in institutions of higher learning especially in the University; they are expected to have credit pass in Mathematics especially for students offering sciences, management and most of the social science courses. Ekwueme and Ali (2012) support this assertion that the importance of Mathematics is shown in the position it occupies in admission into Nigerian higher institutions; that Joint Admission Matriculation Board (JAMB) brochure states that a credit pass in mathematics is required for admission into the sciences. A pass in mathematics is a necessary requirement for admission into any discipline in many higher institutions all over the world. This makes Mathematics one of the essential subjects for students' advancement. In the secondary school curriculum, according to National Policy on Education (2004) in Nigeria, there are core subjects as well as electives that students must offer. The core subjects are compulsory for all the students to study, whether they have aptitude for it or not. Mathematics is one of these core subjects. In fact, Funkywizard-ga (2004) states that the importance of mathematics is two-fold. It is important in the advancement of science, it aids understanding of the workings of the universe and in this present age, and it is important to individuals for personal advancement, both mentally and in the workplace. Isaac (2011) reiterated this when he said that for Nigeria, a developing country that needs Science and Technology for its development, the poor performance of students in Science and Mathematics and worse still, the very insignificant proportion of students who choose Mathematics as a course of study after secondary education has become an issue of great concern to the government and people of Nigeria.

Ukeje in Ekwueme and Ali (2012) asserts that Mathematics is a very important bedrock for the successful functioning of all aspects of human endeavour and that no nation can achieve any measure of scientific and technological advancement without a proper foundation in mathematics Despite the important position mathematics occupies, it remains one of the subjects that students persistently perform very poorly in. Asante (2012) expresses the importance of Mathematics in these words:

> *"In today's fast paced world where individuals deal with information generated from computers and calculators to that of mental estimations of daily purchases, it is imperative that students become proficient in mathematics. Not only must learners deal with a wide range of operational skills, such as computing decimals, they must also understand underlying numerical concepts in order to succeed in a variety of day-to-day commercial and work place situations".*

Asante refers to Mathematics as a subject that determines one's ability to be useful in the society. When students master basic mathematics skills, they are less likely to fail in school and more likely to develop the higher-order thinking skills required for their progress in the future. Competency in these basic academic skills is also necessary for finding and keeping jobs that provide a steady income, benefits, and opportunities for advancement. Despite the importance of mathematics, below average performance of students has been great concerns for all stakeholders and many researchers have tried to work on many variables that are likely to predict underperformance in mathematics.Various researchers have found different factors that affect student's achievement but in our clime, there are dearth of literature on research that combines discipline and professional development in a single study. With the foregoing, it is imperative to found how discipline and professional development predicts senior secondary school student's achievement in Mathematics.

LITERATURE

Oshin (2014) found that below average performance in Mathematics can be blamed on government that is expected to create an enabling environment for effective teaching and learning to take place through the provision of necessary infrastructure, facilities, qualified manpower and encouraging professional development.

However, findings by Iheanachor (2007) indicate that, there is a significant positive relationship between students' academic achievement in mathematics and teachers' background. Teachers who have good qualifications in mathematics have their students performing better in mathematics. Tata (2013) in the study he conducted in Nigeria found that, students' negative attitude toward mathematics, fear of mathematics, inadequate qualified teachers and inadequate teaching materials were some of the causes of poor performance in mathematics. Developing positive attitude, motivation and proper guidance toward mathematics and provision of relevant teaching materials could make students perform better in mathematics.

Factors for students' failure according to (HakiElimu, 2013) was inadequate in-service training, few qualified teachers to teach mathematics and poor working conditions. This was also associated with a lot of confusion caused by limited understanding of the requirements of the 2005 competence-based curriculum and syllabi currently in use (HakiElimu, 2013 & Mtitu, 2014). According to Mabula (2012), students' performance in science subjects was

affected by poor quality of science classroom teaching and a decline in interest of students toward science subjects. Mabula (2012) had shown that 83.9% of students who sat for CSEE failed mathematics in the 2010 national examination and only 16.1% passed mathematics. It was therefore concluded by Mabula (2012), that teacher students relationship in classroom teaching and learning of science need to be improved. Researchers such as Biotenbeck (2011), and Clement (2013), had associated student's failure in mathematics with teachers' teaching practices.

Biotenbeck (2011), defined teaching practices as what teachers do in the classroom, how teachers apply instructional methods and traditional ways of teaching. These were such as lecture style teaching, teacher centre methods and rote memorization in teaching mathematics. However according to Mlozi, Kaguo and Nyamba, (2013), students' performance in mathematics was not good at all in Tanzania as there were not enough teaching and learning materials, mixing of two languages of English and Kiswahili which confuse students. According to SEDP I (2004), generally there had been low quality of schooling outcomes with over 66% failing. This was associated with overloaded curriculum, weak teacher qualifications and teaching abilities of some of the mathematics teachers. The government had lay down a strategy to improve performance in mathematics through optimum use of available mathematics teachers as per strategies set by the URT(2010). To optimize the available teaching the study by (Pantziara & Philipou, 2007) tells us that teaching practices such as problem solving and use of visual aid in the mathematics classroom could increase students' motivation and morale to their performance. This was also supported by Mtitu (2014), Kafyulilo, Innocent and Ikupa, (2012)and URT-MOEVT (2010) that teachers have to be encouraged to apply student centered methods that require teachers to actively involve students in the teaching and learning process.

According to Oshin (2016),poor performance of students at the Senior Secondary Certificate Examination(SSCE) is also linked to factor such as lack of equipped mathematics laboratories, inadequate teachers of mathematics, School Culture, unconducive learning environment, libraries, writing materials as well as population explosion in schools. One observes that only school with the physical indicators in place records high quality academic achievement by their students. The parents also are to blame for not providing conducive atmosphere for their wards at home as some of them prefer spending money on frivolous things like organising parties, purchasing of aso-ebi, rather than paying their wards' school fees and buying their books (Oshin, 2014).

Teachers are central to the performance of student in Mathematics, but lack of competent, adequately motivated and committed mathematics teachers in schools have resulted in not using the necessary skills/methods required to impact the required knowledge in order to ensure that learning take place. Often the teachers are poorly motivated and their salaries very ridiculous.

In all of those, Habour- peters (2000) in Oshin (2014) identified the following distinct causes of poor performance in mathematics

i. Improper preparation of students for the examination by the mathematics teachers.
ii. Teacher including many difficult questions in the examination.
iii. Ambiguity of the instruction as regards the question items.
iv. Lack of self –confidence by students.

v. Poor management of the mathematics examination by the supervisor's and/or invigilators.

vi. Over- crowding of the examination hall.

vii. The temptation of the availability of an avenue to cheat in and out of the examination hall.

viii. Nervousness brought about by mathematics being thought of as an abstract discipline 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 and/or course in mathematics even when the student lacks the requisite skills to make the minimum requirement for the 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 reason.

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 profession courses causing severe competition for the limited chances in the educational establishment.

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

xviii. The absence of good guidance counselors in school to give special guidance and counseling to the mathematics students.

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

Other researchers have identified certain factors in secondary schools that can influence students' achievement. Auerbach, (2002) identified setting directions, developing people, and redesigning the organization as parts of the common cores of practices that any successful leader calls on, as needed. Many of these practices are common to different models of leadership as well. These practices can be thought of as the basics of successful leadership. Such practices are sufficient for leaders aiming to significantly improve student learning in their schools. But without them, not much would happen. Despite these numerous findings and uses of education to the nation and individual, Nigeria educational system has been challenged and criticized for gross indiscipline among the students at all levels and quality of teachers employed This has been having serious disruptive effects on teaching and learning process in the classroom, consequently leading to poor academic achievement by the students.

Studies

Oshin et al (2017) in their study on school practices submitted to TETFUND also identified the set of practices that make up the basic core of successful leadership practices which predicts students' achievement in mathematics. The set of practices they identified are: Developing People, Discipline, Allocation of Time and Space, Feedback and Reinforcement as well as Redesigning the Organisation. Therefore, this study found the type of relationship that exists between discipline, professional development, and students' achievement in mathematics.

Developing People, which we referred to as professional development, which is one of our targets in this studyinvolves providing teachers and others in the system with the necessary support and training to succeed. Teachers' professional development is conceived as the sum total of formal and informal learning pursued and experienced by the teacher in a compelling learning environment under conditions of complexity and dynamic change (Fullan, 2005).

According to Fullan (2005), a common underpinning assertion of the above definitions is continuing learning process, by which serving teachers acquire the knowledge, skills and values to sustain the desired spark of intellectual vitality, which will improve the quality of teaching and students' academic performance. Akinwale (2009) identified approaches to professional development such as: seminars, induction courses, workshops, conferences and symposia in educational matters. In the same vein, Usoro (2010) agreed that in-service training, seminars, workshops, and conferences enable employees to bridge the gap between the skills learnt and the one they are expected to perform. This gives help to boost their job performance as well as enhance students' academic achievement in school. Conversely, Banjo (2007) asserted that adequate training of teachers in the latest methodology, to a large extent, determines how the learner learns during instructional activities. In the opinions of Maduekwe and Ajibola (2007), although most of the teachers have teaching qualifications, many of them do not have adequate knowledge of some concepts and they end up imparting the wrong knowledge to their students. According to Mills (2009), the success or failure of students in secondary schools' rests on the quality of instruction received from teachers who are professionally developed and not lack of students' learning abilities.

In order to ensure better academic achievement of students through teaching and learning processes, teachers are expected to have in-depth knowledge of the pedagogy in their subject areas to be able to understand the effective ways of organising and presenting subject matter (objective statements, providing the right methods, learning experiences and learning resources), and evaluating teaching and learning activities in consonance with the set objectives (Ayeni, 2010). Essien, Akpa and Obot (2016) found that there exists positive and small relationship between the frequencies of teachers' attendance at workshops on students' academic achievement in social studies.

Ayeni (2010) posited that in Nigeria, teachers are expected to have sound knowledge of their subject areas to be able to select appropriate and adequate facts for planning their lesson notes, effective delivery of lessons, proper monitoring and evaluation of their students' performance, providing regular feed-back on their students' performance, improvisation of instructional materials, adequate keeping of records and appropriate discipline of their students. Professional development affects students' achievement through three steps. First, professional development enhances teacher knowledge, skills, and motivation. Second, better knowledge, skills, and motivation improve classroom teaching. Third, improved teaching raises student interest (Yoon, 2008).

Students whose teachers are active, always trying to improve their qualification and share experience has high academic achievement, we can assume that such school culture and healthy environment do empower students for learning (Mzia, Martskvishvili and Aptarashvili, 2011). 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.

According to Yahaya et al (2009), "students' misconduct in the classroom interferes with teaching and learning and is thought to be precursor to later school dropout and similar negative social outcomes". Youths are the future of any nation. The future of any society where the youths do not have respect for the societal culture and norms is in jeopardy. Discipline is an integral part of child socialization; hence it is not a lonesome work. It is the duty of all who are involved in the socialization of the child, including the school, to instill proper discipline into the child. Classroom teacher is one of the major stakeholders in the upbringing of the child. He/she interacts with the child more often than any other staff in the school system. Hence his/her role in the proper upbringing of the child is enormous.

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 is 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. Like their approach towards prevention, authoritative educators combine responsiveness (e.g., demonstrating support and caring; striving to prevent lasting harm to the teacher–student relationship) (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 behaviour; (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 behaviour; (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 misbehaviour, Senge (2006) suggests that effective educators should work hard to avoid using punishment. Instead, they should focus on strategies for developing self-discipline and for preventing misbehaviour. When correcting misbehaviour, 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).

Teachers' professional development is informed by the fact that if teachers are to perform well on their teaching responsibilities, they must have opportunities for continuing professional development programmes, advancement and improvement in their chosen career. This lack of teachers' professional development may seem to cause set-back in students' academic achievement. Such developments may have been the case with many secondary schools in Nigeria of which the area of study seems not to be an exception.

Hypotheses

Three hypotheses were posed during the study.

H_{o1} There is no relationship between discipline and student's academic achievement in Mathematics

H_{o2} There is no relationship between Professional development and student's academic achievement in Mathematics

H_{o3} There is no relationship among discipline, Professional development, and student's academic achievement in Mathematics

H_{o4} Neither discipline nor Professional development contributes significantly to student's academic achievement in Mathematics

1.6 Significance of the study

The result of the study will 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 to improve student's performance. It adds to research literature

It would serve as an eye opener for teachers to see and acknowledge the importance of discipline and essence of professional development. It will 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 will help all stakeholders to fashion ways of engendering harmonious relationship among students, teachers, principals, and the community. The importance of discipline, professional development (organising workshops, talks, seminar and conferences) so as to create an enabling social and academic environment that is conducive for learning will be revealed to the principals, teachers and students, so that they can jointly improve learning outcomes.

Methodology

Research Design; This study used survey research design. Survey design is a systematic empirical inquiry in which the researcher does not have direct control on the independent variables because their manifestations have already occurred.

Variables in this study:

Independent Variables: Developing People and Discipline

Dependent Variables: Student's achievement in Mathematics

Target population: The target population for this study comprised all Senior Secondary School II (SSS2) students and their teachers in South-West, Nigeria.

Sample and Sampling Technique: Multistage sampling technique was employed in selecting the sample for this study as follows: Simple random sampling technique was used to select three (3) out of the six (6) states in South-West, five (5) Local Government Area (LGA) from each state and from each LGA ten (10) schools and 10students from each school was selected. In all 3 states 15 LGA, 150 schools and 1500 students were used. Also, purposive sampling method was used to select two (2) teachers of Mathematics from each school. This is done to select the teachers that had taught and are teaching the students in the senior secondary classes who are used to the practices of the schools. Thus, a total of three hundred (300) teachers of Mathematics were used for the study.

Instrumentation: Two instruments used for the study are:

- Discipline and Professional Development Questionnaire (DPDQ)
- Mathematics Achievement Test (MAT)

Discipline and Professional Development Questionnaire (DPDQ)**:**Questionnaire was adopted. The practices were defined quantitatively as scales with each scale consisting of a series of teacher survey questions regarding how often the practices occurred in their schools'. The questionnaire (SPQ) had three sections, the bio-data section which contained questions about the participants' demographics i.e. gender, years of work/service at the current school, and location of the school and the second and third sections contained ten (10) with four likert sub-scales.Six items on professional development and four items on discipline.

The Questionnaire was developed by Oshin (2014). It was pilot tested on ten (10) randomly chosen secondary school teachers so as to eliminate difficulties in understanding the questionnaire items. 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 10 and 40 (see Appendix 1).The reliability and

content validity of the instrument was established using Cronbach alpha and Lawshe methods respectively. The reliability of the instruments was .82 and the value obtained from Lawshe was .86 respectively.

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

CVR = Content Validity Ratio

Ne = No of panels rating the item good

N = Total number of panels

Mathematics Achievement Test (MAT): The test was adapted by the researchers based on the Senior Secondary II Mathematics Curriculum. MAT was developed by Oshin (2014), the reliability coefficient was determined using Kuder- Richardson 20 (KR-20) and the reliability index was 0.80.while the content and face validity were ascertained by ten (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 30 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 0.35 and 0.70 with the discriminating indices ranged between 0.30 and 0.65 were selected.

Data collection procedure: The researchers engaged six (6) trained research assistants to assist in data collection. Which took three weeks.The researchers and the trained research assistants administered the instruments to the students and the teachers.

Data analysis: The data was analysed using Pearson Product Moment Correlation Coefficients, Anova and Multiple Regression Analysis.

Methodological Challenges: The major challenge the investigators faced was the cooperation of the principals, teachers and the students of the schools.The second challenge the researchers encountered during the administration of the instruments was the disruption of the school timetable. To overcome the problems, the researcher established rapport with the school authority in order to gain their cooperation and support.

RESULTS AND DISCUSSION

The descriptive statistics of the three variables were revealed in Table 1

Table 1: Descriptive Statistics

	Mean	Std. Deviation	N
Mathematics achievement test	15.1060	5.98063	1500
Devloping people	13.2273	3.24839	1500

Discpline	11.5327	2.65260	1500

Table 1 revealed the mean scores and standard deviation of the variables. Mathematics achievement (15.11, 5.98), Professional development (13.23, 3.25) and Discipline (11.53, 2.65)

H_{o1} There is no relationship between discipline and student's academic achievement in Mathematics

Table 2: Correlations discipline and students achievement in mathematics

		Mathematics achievement test	Discipline
Mathematics achievement test	Pearson Correlation	1	.205**
	Sig. (2-tailed)		.000
	N	1500	1500
Discipline	Pearson Correlation	.205**	1
	Sig. (2-tailed)	.000	
	N	1500	1500

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

Table 2 revealed the correlation coefficient that exist between discipline and students' achievement in mathematics (r=.21) which indicates that there is a significant positive relationship between professional development and students' achievement in mathematics. Therefore, the null hypothesis is rejected.

H_{o2} There is no relationship between Professional development and student's academic achievement in Mathematics

Table 3: Correlations between development and students' achievement in mathematics

		Mathematics achievement test	Professional development
Mathematics achievement test	Pearson Correlation	1	.179**
	Sig. (2-tailed)		.000
	N	1500	1500
Professional development	Pearson Correlation	.179**	1
	Sig. (2-tailed)	.000	
	N	1500	1500

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

Table 3revealed the correlation coefficient that exist between professional development and students' achievement in mathematics (r=.18) which indicates that there is a significant positive relationship between professional development and students' achievement in mathematics which leads to the rejection of the null hypothesis.

H_{o3} There is no relationship among discipline, Professional development, and student's academic achievement in Mathematics

Table 4: Correlations

		Mathematics achievement test	Professional development	Discpline
Pearson Correlation	Mathematics achievement test	1.000	.179	.205

	Professional development	.179	1.000	.238
	Discipline	.205	.238	1.000
	Mathematics achievement test	.	.000	.000
Sig. (1-tailed)	Professional development	.000	.	.000
	Discipline	.000	.000	.
	Mathematics achievement test	1500	1500	1500
N	Professional development	1500	1500	1500
	Discipline	1500	1500	1500

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.245[a]	.060	.059	5.80233	.060	47.770	2	1497	.000

a. Predictors: (Constant), Discpline, Devloping people

The models in Table 5 revealed the strength of the association/magnitude of the relationship between the two variables and achievement in Mathematics (R) .245. This means that there was a .245 degree of relationship between achievement in Mathematics and the two variables. The relationship is positive. Therefore, the null hypothesis is rejected.

The coefficient of determination (R^2) for practices is.060 which shows that 6.0% of total variance in Mathematics score was shared with the linear combination of the two variables. The adjusted coefficient of multiple determination (Adjusted R^2) for the two variables is.059. This means that 5.9% of the two variables 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 error of estimate is 5.80233. 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).

Table 6: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3216.566	2	1608.283	47.770	.000[b]
	Residual	50399.580	1497	33.667		
	Total	53616.146	1499			

a. Dependent Variable: Mathematics achievement test

b. Predictors: (Constant), Discpline, Devloping people

Table 6 shows that 47.770% of the variance observed in Mathematics is accounted for by Discipline and professional development (predictors) and these variances/observations are statistically significant F (2, 1497) =47.770 P< 0.05.

H_{o4} Neither discipline nor Professional development contributes significantly to student's academic achievement in Mathematics

Table 7: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	7.270	.816		8.905	.000	5.669	8.871					
	Professional development	.254	.048	.138	5.354	.000	.161	.348	.179	.137	.134	.943	1.060
	Discipline	.388	.058	.172	6.666	.000	.274	.502	.205	.170	.167	.943	1.060

a. Dependent Variable: Mathematics achievement test

Table 7 reports the standardized 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.Table 7 revealed that discipline (t= 6.67) predicts achievement better than Professional development (t=5.35)

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. The table shows that discipline

(β= .172, t= 6.666, p< 0.05) and Professional development (β= .138, t= 5.358) predicted achievement in mathematics.

Discussion of findings

The result that both discipline and professional developmentstatistically predicted senior secondary school students' achievement in mathematics supports the finding of Dupper and Meyer-Adams (2002) and Oshin (2014) who discovered that some practices in schools enhances better learning. This finding revealed that discipline has an effect on achievement this supports the findings of Bear (2008), Bowman (2010) and Oshin (2014) that when correcting misbehaviour, effective educators work hard to avoid using punishment. Instead, they 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 and verbal reprimands rather than using harsh forms of punishment such as suspension. Also, the finding corroborates that of Dupper and Meyer-Adams (2002) who discovered that improved student behaviour supports better learning.

Also, the result that professional development is significant support the finding of Usoro (2010) agreed that in-service training, seminars, workshops, and conferences enable employees to bridge the gap between the skills learnt and the one they are expected to perform. This gives help to boost their job performance as well as enhance students' academic achievement in school. Conversely, Banjo (2007) asserted that adequate training of teachers in the latest methodology, to a large extent, determines how the learner learns during instructional activities. In the opinions of Maduekwe and Ajibola (2007), in spite of the fact that most of the teachers have teaching qualifications, many of them do not have adequate knowledge of some concepts and they end up imparting the wrong knowledge to their students.It also corroborated the finding of Mills (2009), who asserted that the success or failure of students in secondary schools' rests on the quality of instruction received from teachers who are professionally developed and not lack of students' learning abilities.

According to SEDP I (2004), generally there had been low quality of schooling outcomes with over 66% failing. This was associated with overloaded curriculum, weak teacher qualifications and teaching abilities of some of the mathematics teachers.

Conclusion

The findings clearly revealed discipline and professional development as prognosticator of secondary school students'achievement in mathematics. It can be concluded that the two predictor variables are effective in improving students'academic achievement in Mathematics. This investigation has generated baseline data about the importance of discipline and professional development in schools.

Recommendations

- Enlightenment programmes should be organized on what should constitute the disciplinary measures to take in schools to improve students' achievement in Mathematics.
- When correcting misbehavior, effective educators should avoid using punishment. Instead, they should focus on strategies for developing self-discipline and for preventing misbehaviour.

- 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.
- Teachers should be encouraged to be innovative and implement whatever knowledge they acquired during the training.
- The findings concerning school managers/administrators also suggest that more academic training programmes need to be developed in schools. This will help their students attain greater heights.

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APPENDIX 1

DISCIPLINE AND DEVELOPING PEOPLE QUESTIONNAIRE (SPQ).

Introduction: The researcher is interested in examining the extent to which school practices could determine student academic achievement. 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: …… Year of Service at the current school: ……....

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	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.				