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Impact of Teachers' Instructional Practices On Students' Achievement and Self-Efficacy in Mathematics

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Abstract

The study investigated the impact of teachers' instructional practices on students' achievement and self-efficacy in Mathematics. The study specifically examined the impact of instructional practices namely: communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment on the achievement and self-efficacy of students in Mathematics. Descriptive survey research and ex-post facto research design was adopted for the study. The population of the study consists of Senior Secondary School Three (SSS3) students registered in public secondary schools Ekiti State, Nigeria. A total of 600 Senior Secondary School Three (SSS3) students were sampled through stratified random sampling technique from the three senatorial districts of Ekiti State. Two research questions and two hypotheses were postulated for the study. Two research instruments namely; Student's Questionnaire on Mathematic Teacher's Practices (SQMTP) and Students Mathematics Self-Efficacy Questionnaire (SMSEQ) were used for collection of data for the study. The instruments were duly validated by one subject specialists and three experts in educational measurement and evaluation. An internal consistency coefficient of 0.84 for SQMTP and 0.86 for SMSEQ was obtained using Cronbach alpha method. Regression analysis was carried out on the data gathered. The result of the study revealed that all the teachers' instructional practices considered namely; communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment significantly influence students' achievement and self-

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efficacy in Mathematics. The use of formative assessment had the highest contribution to the achievement and self-efficacy of students in Mathematics. Based on the results of the study, it was recommended among others that teachers should consistently use these instructional practices; communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment in the course of teaching Mathematics.

Keywords: Instructional practices, achievement, self-efficacy,

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Introduction

The knowledge of Mathematics is very essential and needed by other disciplines without which it becomes impossible to develop models used for solving problems related to the disciplines. Disciplines such as Economics, social sciences, sciences and engineering are among those disciplines whose bedrock is Mathematics. For this reason, Mathematics becomes one of the core subjects offered at both primary and secondary level of education in Nigeria; as this is expected to help individual student develop logical and abstract thinking ability. It relatively contributes to the political, economic and technological development of the nation. The placement of Mathematics in Secondary School curriculum in Nigeria is important for scientific development and students' academic progress.

The efforts and resources put together in designing a curriculum can only be well appreciated when it is properly implemented. The teacher is the most important factor in the educational process; that is instrumental to the successful implementation of the curriculum and any educational policy. The teacher interprets the curriculum into a useable form, bringing its contents to the heart of the learner. Its success is dependent on the quality of the teachers implementing it. The effectiveness of an educational system depends on the effectiveness of the teachers. The core factor affecting academic progress of students is differences in effectiveness of individual classroom teacher. An effective teacher is the one who does everything legitimately possible to produces desired results in the course of implementing the curriculum. Effective teaching involves total recognition of what to do, how to do it, when to do it and why to do it. (Popoola & Falebita, 2016; Popoola, 2013, Goodwin, 2010).

Effective teaching at any level of education involves quite a number of interactive and inter-related activities between the teacher and the learners in the classroom. The teacher is the driving component in a teaching-learning situation who controls, directs, instructs and motivates learners for the attainment of the instruction objective. The effectiveness of a teacher may be contingent on the interactive activities that take place between the teacher and the learners within the classroom. When the teaching-learning process is teacher centered, he/she decides solely the direction the lesson follows; most times, the lesson is limited to what the teacher prepares for and never tolerate any other thing outside his/her preparation. Effective and ineffective teachers are different from one another based on those different things they practice in classroom.

Goe (2008) opined that instructional practices are the ways the teacher interacts with students and the teaching strategies used in accomplishing specific teaching tasks. Various researchers have identified and emphasized different practices in effective teaching. Some of these practices among others includes; conscious management and organization of classroom, offering active learning experiences, communicating clear learning objectives or performance expectations to students, providing intellectual challenge, usability of instructional materials, encourage classroom discussion, allowing students to explain what they are learning, feedback, use of manipulatives, aligning instruction with assessment, teaching with technology, usage of formative assessment, motivation, self-regulated learning usage of metacognitive strategies (Osunro & Egbeji, 2015; Wiliam, 2011; Goe & Stickler, 2008; Wenglinsky, 2002). Teacher practices focus on those things teachers do in the classroom with their students in order to foster learning. Teachers are expected to fully be in charge of the classroom; the choices they make about classroom practices can either meaningfully enable student learning or serve as an impediment to learning. Wenglinsky (2002) revealed that classroom practices produce improvements in the academic achievement of students, regardless of their backgrounds. The teacher's instructional practices focus on in this study

are communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment.

Effective learning is said to have taken place when the instructional objectives have been achieved. Effective teaching is measured by the degree to which the teacher is able to achieve the set learning objectives (Mbah, 2015). Learning objectives are guide to any lesson; it shows in clarity areas to cover and areas not to go to in a lesson by the teacher. When clear learning objectives are communicated, both the teacher and the students would benefit from it. The teachers would have a clear knowledge of content, be guided in presenting the content of the lesson and would be able to plan students' assessment in a way that reflects exactly what they have been taught while the students would have a clear trail of learning and would be able to plan and prepare for tests and classwork. When the teacher presents clear learning objectives or performance expectations to the students in a learner-friendly language at the beginning of a lesson, the lesson would end with sound assessment (Hopkins, 2005). Most often, students do not know what is expected of them, and therefore do not take responsibility for their own learning. With the communication of learning objectives, students become aware and conscious of the task ahead of them. Teachers must communicate to their students their learning objectives in clear terms that students would be able to understand, from the beginning of the lesson (Stiggins, 2002). When the teacher and students work with the learning objectives, it will not only solve problems for teachers, but also problems for students. Edinyang & Ubi (2010) opined that students presented with specific learning objectives prior to instruction have a significantly higher academic achievement. Mbah (2015) revealed that the use of prior knowledge of instructional objectives amongst students enhanced their academic achievement.

A group of individuals have the ability to collaborate with one another in order to find a way out of a situation or find solution to a particular problem which may not be known to students. Sometimes, students attach a negative meaning or see it as a sign of weakness or dependence to ask classmate for help in classroom situation. The teacher has the responsibility to guide and encourage the students on working together. Collaborative learning enables learners to collaboratively work on problems or task posed to them by the teacher. (Falebita, 2019; Nwaubami, Ogbueghu, Adeniyi and Eze, 2016). Frome, Lasater and Cooney (2005) revealed some collaborative learning practices encouraged by some teachers among which include group work on challenging assignments, oral presentations and written reports on Mathematics projects and explanation to the entire class. They found that these collaborative practices correlated with the achievement of students in Mathematics. Collaborative learning is a learner-centered strategy where learners actively participate in the process, share ideas with colleague and collectively find solution to given problem under the guidance and coordination of the teacher. Falebita (2019) who examined the effect of cooperative learning strategies which are forms of collaborative learning found that collaborative leaning significantly contributes to students' academic achievement and their disposition towards Mathematics. Azlina (2010) revealed that collaborative learning technique that aimed at increasing participation by allowing a group of collaborators to interact and share ideas, would lead to knowledge building among them and thus influence their academic achievement.

Manipulatives are materials or objects designed to represent explicitly and concretely mathematical ideas that are abstract. They have both visual and tactile appeal and can be manipulated by teacher or learners through hands-on experiences (Moyer, 2001). Manipulatives are concrete or physical objects which could be used to explain or discover mathematical concepts. These could be a readymade self-made objects specifically designed

for Mathematics teaching and learning or for other purposes. Manipulatives are powerful tools which build conceptual understanding of Mathematics. Manipulatives aid the cognitive process and in addition it is advantageous in engaging students and increasing interest, enjoyment of and achievement in Mathematics. Students who are under the lesson where manipulatives were used, reported that they are more interested in mathematics, this later translate to increased mathematical ability and enhanced academic achievement (Carbonneau, Marley & Selg, 2013). Carbonneau, Marley & Selg (2013) found statistically significant positive effect of manipulatives on learning particularly among small number of learners in a classroom. Meng & Idris (2012) revealed that the knowledge received by learners taught using manipulatives becomes permanent and irreversible and this invariably contributes to their academic achievement. The use of manipulative could help learners to concentrate, engage in learning process, and actively participate in the classroom activities and also improve their achievement and self-efficacy in Mathematics.

The use of technology in classroom of schools in developed nation of the world is simply normal but for schools in the developing and underdeveloped nations looks unreal. Most schools in the developing nations particularly schools in rural areas have nothing more than chairs, tables and chalkboard in the classroom. In this era where science and technology plays major role in the advancement of a nation, the government of Nigeria has been advocating the use and easy access for computer instructions. It has become apparent that teaching, learning and technology work synergistically to enhance effective learning since educational technology helps teachers create learning situations that were not possible with traditional teaching methods (Wiske, Franz, and Breit, 2005). Newby, Stepich, Lehman, & Russell (2006) identified computers, overhead transparencies, televisions and videotapes as educational technology tools used in classroom situation for effective learning experiences and motivation. They further stressed that using different and appropriate forms of technology in classrooms is necessary. Smaldino, Russell, Heinich & Molenda (2005) opined that in classes where use of technology is implemented, interactive student involvement in the learning process is fostered, and learning becomes more fun and more attractive for the students. Wiske, Franz, and Breit (2005) found out the use of technology in the teaching and learning of Mathematics enhances students' learning outcomes. Hence, the use of technology could have a positive influence on the achievement and self-efficacy of students in Mathematics. Also, Falebita (2019) found out that the use of computer in learning Mathematics in a collaborative way contributes to students' academic achievement.

Assessment plays a major role in checking if effective teaching and learning process has taken place in the classroom. It is a tool considered for making classroom or educational decisions. Generally, assessment can either be summative or formative; it is summative when it's only carried out at the end of an educational programme while it is formative if carried out regularly during or after a lesson to ascertain if specified learning objectives have been achieved. Arter (2003) opined that the teachers must walkout the balance between both summative assessment, which is of learning, and formative assessment, which is for learning. In furtherance to this, Stiggins (2002) stated that student achievement suffers because of the tests conducted once in a year which are unable to provide teachers with momentary or daily information about student achievement; this information is said to be key in making crucial instructional decisions. When decisions related to teaching and learning are to be taken from classroom assessment then it is very important that such assessment be carried out during the teaching-learning process. It's important to note that both the teacher and student benefits from formative assessment; it helps the teacher to identify difficulty areas in the teaching-learning process and also help in proffering solution to identified challenges with

the aim of improving students' academic achievement. Orheruata & Oyakhirome (2019) revealed from their study on the effect of formative classroom assessment on students' academic achievement that within the classroom, the use of formative assessment significantly improves the academic achievement of students. They stressed that when teachers practice the use of formative classroom assessment with timely feedback mechanism, students' academic achievement will be positively impact. Ajogbeje (2013) also found out a significant effect of formative testing with feedback on students' achievement in Mathematics. He stated further that use of formative assessment has brought about unpretentious critical learning and has greatly impact students' academic achievement.

Self-efficacy is defined as an individual's confidence or judgments in his or her ability to organize, pursue and complete the activities essential to achieve a learning outcome. Students with high self-efficacy have the ability to be persistent in finding solution to a problem even after failing the first attempt. Their continuous effort and persistence lead them to perform better in the classroom (Bandura, 1997). Students' Mathematics self-efficacy is the perception or conviction of students on their capability to solve mathematical problems or given task. Bandura (1997) identified four factors that determine self-efficacy: mastery experiences, vicarious learning experience, social verbal persuasion, and specific psychological states. Mastery experience is the most powerful of these factors; it is the experience gained by individual learner based on prior task accomplishments, and whether success is interpreted through a growth or fixed mindset. In a vicarious learning experience, the learner see a peer model perform the task or activity. The students develop an expectation that they too can carry out the task once they see the model carrying it out. Seeing peer model succeeding increases the level of the learner's self-efficacy and vice versa. In social verbal persuasion, based on teacher expectations and verbal persuasion, the teacher put in effort to encourage individual learners who may doubt their competences. The learners get the required support they can expect from teachers and peers. For specific psychological states, the emotional states of the learner which can either positively or negatively affect the interpretation of learning outcome (Usher & Pajares, 2009; Zeldin, Britner &Pajares, 2008; Usher & Pajares, 2006; Hampton & Mason, 2003; Bandura, 1997; Bandura, 1986). These four factors have been found to influence both academic and self-efficacy beliefs (Usher & Pajares, 2006).

Students with high self-efficacy take-up challenges and endure failure, while those with low self-efficacy are more likely to avoid difficult tasks, and have low commitment to achieving set objectives. Students with higher self-efficacy set higher goals and use more effort on working out their achievement. Self-efficacy and achievement are interrelated. Usher and Pajares (2009) recognized self-efficacy as a multidimensional construct and emphasizes the need for researchers to develop comprehensive measures that assess its multidimensionality. Most researches have focus on self-efficacy as an input to learning, that is, what learners bring in to the learning situation which probably contributes to their achievement. Against this, Pampaka, Kleanthous, Hutcheson & Wake (2011) posited self-efficacy as a learning outcome and emphasizes the engagement of teachers in various active learning activities within the classroom that could increase students' self-efficacy. Teachers have important role to play in improving the self-efficacy of students in Mathematics. Siegle & McCoach (2007) opined that when teachers improve their instructional practices, this will result in increase in their students' self-efficacy. They concluded that teachers who on a daily basis engage in instructional practices such as posting the lesson's objectives prior to instruction (communication of learning objectives) and reviewing the lesson objectives at the end of every lesson (formative assessment) increase student self-efficacy: teachers who use

these strategies on a daily basis produce students who are more confident in their academic skills (Siegle & McCoach, 2007).

Statement of Problem

The indices of students' poor achievement at the Senior Secondary School Certificate Examinations have been attributed to poor teaching strategies. Teaching without proper planning and instructional materials, usage of teacher-centered strategies, inadequate teaching facilities, poor attitude of teachers and poor assessment strategy among others. Little or no improvement has been achieved in the years back on the poor achievement of students in Mathematics. The teacher initiates and coordinates learning activities in the classroom. The way a teacher regularly initiates and coordinate lesson could determine students' self-belief about their ability in the subject. Teacher factor has been identified as one of the major causes of students' poor performance and low self-efficacy in Mathematics, there is need to investigate effectiveness of some of the instructional practices carried out by Mathematics teachers in our schools. Self-efficacy have been described as a construct that is interrelated with achievement and most researcher have identified it as an input to learning and not as learning outcome. This study therefore examined the impact of teachers' instructional practices on students' achievement and self-efficacy in Mathematics.

Research Questions

The following research questions were raised for the study:

1. What is the relative contribution of each teacher's instructional practices to the achievement of students in Mathematics?
2. What is the relative contribution of each teacher's instructional practices to the self-efficacy of students in Mathematics?

Research Hypotheses

The following research hypotheses were generated and tested at 0.05 level of significance:

1. There is no significant influence of teacher's instructional practices on students' academic achievement in Mathematics.
2. There is no significant influence of teacher's instructional practices and students' self-efficacy in Mathematics

Methodology

This study adopted the descriptive survey research and ex-post facto design. It surveyed the use of five instructional practices of teachers in the teaching of Mathematics and the students' self-efficacy in Mathematics. Ex-post facto was involved because the researcher do not have direct control on the dependent and the independent variables, hence no treatment or manipulation of subjects instead data were collected from records on students' achievement in Mathematics. The SSCE Mathematics achievement (grade) were collected and converted to Mathematics Grade Points (MGP). The population for the study consists of the senior secondary school three (SSS 3) students in Ekiti State, Nigeria. The sample for the study consists of 600 respondents who are SSS 3 students from public secondary schools in Ekiti State. The sample was randomly selected from the three senatorial districts (Ekiti North, Ekiti Central and Ekiti North) of Ekiti State using stratified random sampling technique.

The instruments used for the study are Student's Questionnaire on Mathematic Teacher's Practices (SQMTP) and Students Mathematics Self-Efficacy Questionnaire (SMSEQ). The instruments were validated by four experts; three in measurement and evaluation and one in Mathematics education. They established the face and content validity of the instrument and their corrections effected. The reliability of the instruments was established by administering them to 40 students who were not part of the sample of the study. Cronbach

alpha was used to determine the reliability which yielded 0.84 for SQMTP and 0.86 for SMSEQ.

Results

Research Question 1: What is the relative contribution of each of the teacher's instructional practices to the achievement of students in Mathematics?

Table 1: Regressing analysis showing the contribution of each teacher's instructional practices to the achievement of students in Mathematics

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5.960	0.476		-12.515	.000
	Teaching with Technology	0.107	0.039	0.081	2.753	.006
	Collaborative learning	0.454	0.041	0.339	10.964	.000
	Use of formative assessment	0.531	0.051	0.334	10.369	.000
	Communication of clear learning objectives	0.419	0.051	0.274	8.154	.000
	Use of manipulatives	0.378	0.049	0.235	7.792	.000

a Dependent Variable: MGP

The result presented in table 1 shows that teacher's instructional practices such as communication of clear learning objectives (CLO), collaborative learning experiences (CL), use of manipulatives (UM), teaching with technology (TT) and use of formative assessment (FA) contribute to students' academic achievement in Mathematics. The table indicated that all the instructional practices of teachers considered contribute significantly to the students' Mathematics achievement. It also revealed that use of formative assessment had the highest contribution followed by use of collaborative learning experiences. Communication of clear learning objectives also made high contribution; this is followed by use of manipulative while Teaching with technology made the lowest contribution to Students' Achievement in Mathematics. The derived regression equation is: MGP = 0.107(TT) + 0.454(CL) + 0.531(FA) + 0.419(CLO) + 0.378(UM) – 5.960. This indicates that the teacher's instructional practices such as communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment had regression coefficients of 0.419, 0.454, 0.378, 0.107 and 0.531 respectively with a constant of -5.960.

Research Question 2: What is the relative contribution of each of the teacher's instructional practices to the self-efficacy of students in Mathematics?

Table 2: Regressing analysis showing the contribution of each of the teacher's instructional practices to the self-efficacy of students in Mathematics

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-4.126	0.591		-6.983	.000
	Teaching with Technology	0.140	0.048	0.107	2.922	.004

	Collaborative learning	0.382	0.051	0.285	7.433	.000
	Use of formative assessment	0.383	0.064	0.241	6.021	.000
	Communication of clear learning objectives	0.365	0.064	0.238	5.719	.000
	Use of manipulatives	0.296	0.060	0.184	4.912	.000

a Dependent Variable: SSE

In table 2, it is observed that teacher's instructional practices (CLO, CL, UM, TT and FA) contribute to students' self-efficacy in Mathematics. All the teacher's instructional practices (CLO, CL, UM, TT and FA) contribute significantly to the students' Mathematics self-efficacy. It also revealed that use of formative assessment had the highest contribution followed by use of collaborative learning experiences. Communication of clear learning objectives also contributed significantly to students' Mathematics self-efficacy; this is followed by use of manipulative while Teaching with technology made the lowest contribution to Students' Mathematics self-efficacy. The derived regression equation is: MGP = 0.140(TT) + 0.382(CL) + 0.383(FA) + 0.365(CLO) + 0.296(UM) – 4.126. This indicates that communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment had regression coefficients of 0.365, 0.382, 0.296, 0.140 and 0.383 respectively with a constant of -4.126.

Hypotheses Testing

Hypothesis 1: There is no significant influence of teacher's instructional practices on students' academic achievement in Mathematics.

Table 3: ANOVA of the joint influence of teacher's instructional practices on students' Mathematics achievement

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1413.612	5	282.722	146.179	.000(a)
	Residual	916.755	474	1.934		
	Total	2330.367	479			
Model Summary						
R	–	0.777				
R^2	–	0.607				
Adjusted R square	–	0.602				
Std. Error of the Estimate	–	1.39071				

a Predictors: (Constant), U.MANIP, T.TECH, COLAB, F.ASS, CL.OBJ
b Dependent Variable: MGP

The results in table 3 shows the level of significance of the joint influence of all the teachers' instructional practices considered. The table shows that R value of 0.777 was significant (F = 146.179, P < 0.05). The five teachers' instructional practices made significant combined contribution to students' achievement in Mathematics. This denotes that there is significant influence of teachers' instructional practices on students' academic achievement in Mathematics. Hence, hypothesis one is rejected. The table also reveals that the five teacher's instructional practices namely: communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment taken together jointly correlate positively (R = 0.777) with student's Mathematics achievement. This suggests that, the five instructional practices have positive multiple relationships with student's Mathematics achievement. Hence, they have the potential of

explaining student's achievement in mathematics to a certain extent. Also, the five instructional practices could explain 60.7% of total variance in students' achievement (R^2 = 0.607). This leaves the remaining 39.3% to other factors that were not considered in the study.

Hypothesis 2: There is no significant influence of teacher's instructional practices and students' self-efficacy in Mathematics

Table 4: ANOVA of the joint influence of teacher's instructional practices on students' Mathematics self-efficacy

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	916.173	5	183.235	61.551	.000(a)
	Residual	1411.075	474	2.977		
	Total	2327.248	479			
Model Summary						
R	–	0.627				
R^2	–	0.394				
Adjusted R square	–	0.387				
Std. Error of the Estimate	–	1.72538				

a Predictors: (Constant), U.MANIP, T.TECH, COLAB, F.ASS, CL.OBJ
b Dependent Variable: SSE

Table 4 presents the results of ANOVA of the joint influence of teachers' instructional practices on students' Mathematics self-efficacy. It shows that R value of 0.627 was significant ($F = 61.551$, $P < 0.05$). The five teachers' instructional practices made significant combined contribution to students' self-efficacy in Mathematics. This indicates that there is significant influence of teachers' instructional practices on students' self-efficacy in Mathematics. Hence, hypothesis two is rejected. The table also shows that the five teacher's instructional practices namely: communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment taken together jointly correlate positively (R = 0.627) with student's Mathematics self-efficacy. This suggests that, the five instructional practices have positive multiple relationships with student's Mathematics self-efficacy. Hence, they have the potential of explaining student's self-efficacy in mathematics to a certain level. Also, the five instructional practices could explain 39.4% of total variance in students' Mathematics self-efficacy (R^2 = 0.394). This leaves the remaining 60.6% to other factors that were not considered in the study.

Discussions

The result of the study has shown that there was significant influence of teachers' instructional practices on students' academic achievement in Mathematics. All the teacher's instructional practices considered (communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment) contributed significantly to students' academic achievement in Mathematics. The finding is in support of the findings of Wenglinsky (2002) who revealed that classroom practices produce improvements in the academic achievement of students. The finding also revealed that use of formative assessment has the highest significant contribution to students' Mathematics achievement among the five teachers' instructional practices considered. This corroborates the findings of Orheruata & Oyakhirome (2019) and Ajogbeje (2012) who found

that formative classroom assessment significantly improves the academic achievement of students. The finding also reveals that the four other instructional practices (communication of clear learning objectives, collaborative learning experiences, use of manipulatives and teaching with technology) contribute significantly to students' achievement. This is also in agreement with the findings of Mbah (2015), Falebita (2019), Meng & Idris (2012) and Wiske, Franz & Breit (2005) who revealed that communication of clear learning objectives, collaborative learning experiences, use of manipulatives and teaching with technology contribute to students' achievement respectively.

The result indicated that there was significant influence of teacher's instructional practices on students' Mathematics self-efficacy. Teachers' instructional practice such as communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment all had significant contributions to students' Mathematics self-efficacy. This finding supported the finding of Siegle & McCoach (2007) who revealed that when teachers improve their instructional practices; this will result in increase in their students' self-efficacy. The study recorded significant individual contribution of communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment as teachers' instructional practices to students' Mathematics self-efficacy. The finding of the study also revealed that teaching with technology had the lowest contribution to students' self-efficacy and achievement. This may be due to the fact that technological instructional aids such as computers, overhead transparencies, televisions and videotapes among others are not available or inadequate in most public schools in Nigeria.

Conclusions

This study examines the impact of teachers' instructional practices on students' achievement and self-efficacy in Mathematics. The findings of the study revealed that all teachers' instructional practices considered namely; communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment jointly significantly influence students' achievement and self-efficacy in Mathematics. Also, all the teachers' instructional practices considered relatively had significant contribution to students' achievement and self-efficacy in Mathematics. The use of formative assessment had the highest contribution to the achievement and self-efficacy of students in Mathematics. Collaborative learning and communication of clear learning objectives also significantly contribute to students' achievement and self-efficacy of students in Mathematics. Teaching with technology had the least contribution to students' achievement and self-efficacy in Mathematics among the instructional practices considered; this may be due to lack or inadequacy of educational technology materials in public schools.

Recommendations

Based on the findings of this study it is recommended that teachers should consistently use these instructional practices; communication of clear learning objectives, collaborative learning experiences, use of manipulatives, teaching with technology and use of formative assessment in the course of teaching Mathematics as these will enhance the academic achievement and self-efficacy of students in Mathematics. Government and school owners/heads should regularly organise workshops and seminars on instructional practices and encourage teachers to attend.

References

Ajogbeje, O.J. (2013). Effect of Formative Testing with Feedback on Students' Achievement in Junior Secondary School Mathematics in Ondo State Nigeria: *International Journal of Education Research*, 2, (1).8-20.

Arter, J. A. (2003). Assessment for Learning: Classroom Assessment to Improve Student Achievement and Well-Being. *Educational Resources Information Center (ERIC)*. pg 463 – 484. Retrieved from https://files.eric.ed.gov/fulltext/ED480068.pdf

Azlina, N. A. Nik (2010). CETLa: Supporting Collaborative Activities Among Students and Teachers Through the Use of Think-Pair-Share Techniques. *International Journal of Computer Science Issues,* 7(5), 18-29.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: W.H. Freeman and Company.

Carbonneau, K.J., Marley, S. C. & Selg, S.C. (2013) A meta-analysis of the efficacy of teaching mathematics with concrete manipulatives. *Journal of Educational Psychology. 105(2) 380 – 400*.

Edinyang S. D. & Ubi I. E. (2010) Effect of General and Specific Behavioural Objectives on Students' Achievement Prior to Instruction in Social Studies. *Global Journal of Educational Research. 9(1) 85 – 90*

Eyyam R. & Yaratan. H. S. (2014) impact of use of technology in Mathematics lessons on student achievement and attitudes. *Social Behavior and Personality* http://dx.doi.org/10.2224/sbp.2014.42.0.S31

Falebita, O.S. (2019). Differential Effectiveness of Cooperative Learning Strategies on Senior Secondary School Students' Learning Outcomes in Mathematics in Ekiti State, Nigeria. Unpublished Ph.D Thesis. Ado – Ekiti: Ekiti State University.

Frome, P., Lasater, B., & Cooney, S. (2005). *Well-qualified teachers and high-quality teaching: Are they the same?* (Research Brief). Atlanta, GA: Southern Regional Education Board.

Goe, L., & Stickler, L. (2008). *Teacher quality and student achievement: Making the most recent research* (TQ Research and Policy Brief). Washington, DC: National Comprehensive Center for Teacher Quality. Retrieved from http://www.tqsource.org/publications/March2008Brief.pdf

Goodwin, B. (2010). *Changing the odds for student success: What matters most*. Denver, CO: Mid-continent Research for Education and Learning (McREL).

Hampton, N. Z., & Mason, E. (2003). Learning disabilities, treatment, sources of efficacy, self-efficacy, beliefs, and academic achievement in high school students. *Journal of School Psychology*, *41*, 101–112.

Hopkins, G. (2005). *Education World*. Retrieved June 26, 2006, from http://www.educationworld.com/a_admin/admin400b.shtml

Mbah, B. A. (2015) Effects of Prior Knowledge of Topics and the Instructional Objectives on Students' Achievement in Literature-In-English. Journal of Education and Practice. 6(20) 31 – 34

Meng, C. C. & Idris, N. (2012). Enhancing Students‟ Geometric Thinking and Achievement in Solid Geometry. Journal of Mathematics Education, 5(1), 15-33

Moyer, P. (2001) Are we having fun yet? How teachers use manipulatives to teach Mathematics. Education Studies in Mathematics 47: 175 – 197. Netherlands Kluwer

Newby, T. J., Stepich, D. A., Lehman, J. D., & Russell, J. D. (2006). *Instructional technology for teaching and learning* (3rd ed.). Upper Saddle River, NJ: Pearson Education.

Nwaubami, O.O, Ogbueghu S.N, Adeniyi K.D & Eze D.M (2016) Effects of Think-Pair-Share (TPS) and Student Team Achievement Division (STAD) Instructional Strategies on Senior Secondary School Students' Achievement in Economics. *Australian Journal of Basic and Applied Sciences, 10(13) 1 – 9*

Orheruata, M.U & Oyakhirome, H.A. (2019) Effect of Formative Classroom Assessment on Students' Academic Achievement in Junior Secondary School Basic Science in Egor Local Government Area of Edo State, Nigeria. *Journal of Education and Practice. 10(15) 184 – 189*

Osunro, K. S. & Egbeji, E. E. (2015) Secondary School Students' Assessment of Instructional Practices of English Language Teachers in Kebbi State, Nigeria. *International Journal of Humanities and Social Science Invention. 4(10) 28 – 34*

Pampaka, M., Kleanthous, I., Hutcheson, G.D. & Wake, G. (2011): Measuring mathematics self-efficacy as a learning outcome, Research in Mathematics Education, 13:2, 169-190 retrieved from**:** http://dx.doi.org/10.1080/14794802.2011.585828

Popoola, A.A. & Falebita, O.S. (2016). Effects of Teachers' Lesson Study on Ekiti State Secondary School Students' Achievement in Mathematics. *Researchjournali's Journal of Education. 4(5). 1-10*

Popoola, A.A. (2013). Diversity, equity and Mathematics learning: consideration of literacy approach. Literacy and reading in Nigeria. *Journal of Reading Association of Nigeria (RAN). 14(1): 178-184.*

Siegle, D., & McCoach, D. B. (2007). Increasing student mathematics self-efficacy through teacher training. *Journal of Advanced Academics, 18*, 278–312.

Smaldino, S. E., Russell, J. D., Heinich, R., & Molenda, M. (2005). *Instructional technology and media for learning* (8th ed.). Upper Saddle River, NJ: Pearson Education.

Smaldino, S. E., Russell, J. D., Heinich, R., & Molenda, M. (2005). *Instructional technology and media for learning* (8th ed.). Upper Saddle River, NJ: Pearson Education.

Stiggins, R. J. (2002). Assessment crisis: The absence of assessment for learning. *Phi Delta Kappan*, *83*, 758-765. Retrieved from http://www.pdkintl.org/kappan/k0206sti.htm

Usher, E. L., & Pajares, F. (2006). Sources of academic and selfregulatory efficacy beliefs of entering middle school students. *Contemporary Educational Psychology, 31*, 125–141.

Usher, E. L., & Pajares, F. (2009). Sources of self-efficacy in mathematics: A validation study. *Contemporary Educational Psychology*, *34*, 89–101.

Wenglinsky, H. (2002). How schools matter: The link between teacher classroom practices and student academic performance. *Education Policy Analysis Archives, 10*(12). Retrieved from http://epaa.asu.edu/epaa/v10n12/

Wiliam, D. (2011). What is assessment for learning? Retrieved from http://ww.udir.no/pagefiles/vurderir.

Wiske, M. S., Franz, K. R., & Breit, L. (2005). *Teaching for understanding with technology*. San Francisco, CA: Jossey-Bass.

Zeldin, A. L., Britner, S. L., & Pajares, F. (2008). A comparative study of the self-efficacy of successful men and women in mathematics, science and technology careers. *Journal of Research in Science Teaching*, *45*, 1036–1058.

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