



## **Effects of Collaborative Team and Indigenous Instructional Strategies on Pupils' Achievements in Mathematics at Basic Education Level in South-East Geo-Political Zone in Nigeria for Sustainable Development**

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### ***Abstract***

*The design adopted in this study was quasi-experimental design using a pretest-posttest, control group with 3 X 2 factorial matrix. The variables of the study comprised independent variable (instructional strategies operated at three levels), moderating variable (gender operated at two level) and dependent variable (achievement in Mathematics). The population of the study consisted all primary three pupils in the five states (Anambra, Imo, Abia, Enugu and Ebonyi) of South- East geopolitical zone in Nigeria. Sampling was carried out at multi-stage levels. Two states were randomly selected, the primary schools in each of the selected states were clustered according to the local government areas. One local government areas were randomly chosen from each of the selected states making a total of two local government areas. Three (3) primary schools were randomly chosen from*

*each of the selected local government areas making a total of six (6) primary schools. The selected schools were randomly assigned treatments. The intact classes of the selected primary schools were used for the study. The sample size was one hundred and forty-four pupils (144). Three stimulus treatment packages (Collaborative Team Instructional Package (CTIP), Indigenous Instructional Package (IIP) and Conventional Instructional Package (CIP). Mathematics Achievement Test (MAT with Lawshe's Content Validity Index 0.85;  $r = 0.89$ ) was developed by the researchers and served as a response instrument. Data were analysed with Analysis of Covariance (ANCOVA) using pretest as covariates. The findings of the study showed that instructional strategies showed a significant effect on pupils' achievement in Mathematics. Pupils taught with bilingual instruction ( $F(1, 137) = 123.161, p < 0.05$ ) produced better performance than those taught with collaborative team and foreign language instructions. The study concludes that bilingual instruction produced a better performance than collaborative team and conventional instructions. The study recommends that bilingual instructional strategy should be used by Mathematics teachers in Basic schools to produce better achievement in Mathematics.*

**Keywords:** *Collaborative team strategy, Indigenous instructional strategy, gender, achievement in Mathematics, Basic Education*

## Introduction

Sustainable development as an undefined term was dated back to 1972 at United Nation (UN) conference on the human environment in Stockholm, Sweden. The term was properly and fully defined and translated to policy in 1987, with a UN report entitled "our common future" also known as "the Brundtland report" (The report was named after the Norwegian prime minister who was

the chairman of the UN commission authority of the report). Sustainable development is defined as "development that meets the needs of the presents without compromising the ability of future generation to meet their own needs" (Kyari, (2018)). The World Bank has also defined sustainability in terms of opportunity for future generations using a triangular framework to illustrate the

idea of environmentally sustainable development. United Nations World Commission on Environment and development (1987) also defined sustainable development as "a process of change in which exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations". Sustainable development process must reflect and be dictated by the resource base available to that society and should strive towards optimal utilization of natural and human resources in its environment. Undue reliance on development inputs from extra-territorial sources will result in distorted development (Ikoku cited in Azuka & Kurume, 2015).

Widiati and Juandi (2019) enumerated Sustainable Development Goals (SDGs) as no poverty; zero hunger; good health and well-being; quality education; gender equality; clear water and sanitation; affordable and clean energy; decent work and economic growth; industry, innovation and infrastructure; reduced inequalities; sustainable cities and communities; responsible consumption and production; climate action; life below water; life on land; peace, justice and strong institutions; and partnership for the goals. These goals are clustered into three domains which are Economic domain, Social domain and Environmental domain. Economic domain focuses on eradicating poverty, achieving higher levels of prosperity and enabling continued gains in economic welfare; Social domain focuses on eradicating other dimensions of poverty, improving the quality of education, health, housing and other aspects of welfare of individuals and communities, and enhancing the quality of social interaction, engagement and empowerment while Environmental domain focuses on reducing pollution and other negative impacts on environment, mitigating the effects of industrialization and human activity, and seeking to achieve sustainable use of resources in the interest of future generations. Mathematics as a discipline that pervades other field of science, plays a big role in realizing sustainable development in all its aspects: social, economic and environmental.

Basic Education as a type of education comprising 6 years of primary education and 3 years of junior secondary school (FGN, 2013). National Policy on Education stipulates that basic education include all subjects in primary and junior secondary schools. Adult and non-formal educational programmes at primary and junior secondary school levels for both adults and out-of-school youths are included. These programmes shall be free and compulsory. Universal

Basic Education can be seen as an education programme that every individual must have. It should be a right but not privilege and it should be the sum total of an individual's experience. This level of education is the foundation, pillar, fulcrum and bedrock on which other levels of educational system are built. The success or otherwise of the entire system of education is determined by the Universal Basic Education. The objectives of basic education include;

- i. Ensure unfettered access to nine (9) years of formal basic education.
- ii. Ensuring the acquisition of appropriate levels of numeracy, manipulative, communicative and life skills as well as the ethical, moral and civic values needed for laying a solid foundation for life-long learning.
- iii. To lay a sound basis for scientific and reflective participation in and contribution to the life of the society.
- iv. The provision of free, Universal Basic Education for every Nigerian child of schooling age.
- v. Reducing drastically the incidence of drop-out from the formal school system, through improved relevance, quality and efficiency.
- vi. To give the child the opportunities for developing manipulative skills that will enable the child function in the society within the limit of the child's capacity.
- vii. To develop in the child ability to adapt to the child's changing environment (FGN, 4<sup>th</sup> Edition, 2004)

Mathematics is one of the main subjects taught at Basic Educational level of educational system. Students are being encouraged to take up science-related subject due to the emphasis is placed on scientific and technological advancement in the world, Nigeria inclusive. One main subject that cut across all the science subjects is mathematics. In fact, Mathematics has been defined as a tool of science because science and technology have their roots in Mathematics. In addition, Mathematics is central to all field of human endeavour and play a fundamental role in economic development of a country. Musa (2010) stated the usefulness of mathematics in many fields: national budget planning; census; equitable distribution of amenities; medical field (weight, height, temperature); business and insurance (payments, interest, value calculation); agriculture (porosity of soil, quantity of fertilizer, volume, weight). The role of mathematics in career choice and in understanding the changing

world through logical reasoning, reflective thinking, creative ability as well as problem solving skills are also emphasized. That is why Nigerian government has made Mathematics a compulsory subject at primary and secondary levels of her educational system and also as a prerequisite to the study of science and most of the social science courses in her colleges of education, polytechnics and universities. In fact, in our national march towards scientific and technological advancement, we need nothing short of good performance in mathematics at all levels of schooling most especially at the basic level.

Furthermore, Mathematics education is a tool for achieving most of the objectives of basic education. In fact, there is no gainsaying that the success or otherwise of Basic level of Nigerian educational system is dependent on Mathematics as its fulcrum. Various scholars have attested to this fact. Yara in Oyegoke (2014) emphasized that the knowledge of mathematics is necessary to make an individual live a meaning life and to contribute meaningfully to the society. This knowledge of mathematics affects all human endeavours – economic, political, social, geographical, scientific and technological. Bolaji cited in Oyegoke (2011) opined that mathematics is a compulsory subject at both basic and secondary levels of education due to its application to individual daily living but not to make students become mathematicians. It was also noted that laying a sound foundation for mathematics at basic level of education is essential in order to avoid difficulty in understanding some critical problems in senior secondary school which could automatically lead to failure in mathematics examination at senior secondary schools (Adegbuyi cited in Oyegoke, 2014).

Despite the stakeholders' effort to make mathematics a worthwhile subject through improved performance, research like that of Monitoring of Learning Achievement (MLA) project (2003) conducted by the Federal Ministry of Education in conjunction with UNICEF and UNESCO have shown the deterioration of students' attainment in the subject at both basic and secondary levels of educational system in the country. The population was made up of basic schools and senior secondary schools. The sample comprise basic four pupils, basic six pupils, basic eight students and senior secondary two students. The finding of the study showed a low level of achievement in mathematics. The mean score in numeracy test for basic four was 33.74 and the standard deviation was 20.32 while the mean score for basic six was 35.73 and the standard deviation was 18.07.

Team teaching as the name implies is teaching in teams. It is a strategy of teaching that engages more than a teaching in carrying out out-of-classroom and classroom instructional activities in parting knowledge to students. This type of strategy has been defined by various scholars. Teachers involved in team teaching plan, implement and evaluate instructions. They also interact with all students and determine the level of students' engagement during the implement of instruction. students on the other hand considered them to be equal (Peeler, 2010).

Team teaching are in various forms and categories. Such forms include; a form in which each member functions independently but the team comes together to exchange opinion, ideas, knowledge, views and sharing of teaching and learning materials. A form in which a team of teachers share a common learning materials or resource center only but they carry out class instruction individually. A form in which in which students and instructional planning are shared but members teach various sub-sets of the same set of students. A form in which a teacher single handedly plans the teaching activities for a team of teachers. A form in which each teacher teaches his/her own specialized area to the entire students but the teachers in the team co-plan. Categories of team teaching are traditional team teaching, collaborative team teaching, parallel team teaching, supportive team teaching, differentiated team teaching and monitoring teacher (Goetz cited in Oyegoke, 2019).

Collaborative team teaching is also called “one brain in two bodies” by Goetz. In collaborative team teachers deliver the same instruction at the same time instead of employing monologue style of lesson presentation by a single teacher. They work together to prepare lesson and present the lesson by exchanging, explaining and discussing the topic of the lesson to students. Collaborative teachers are actively involved lesson planning, lesson presentation and lesson evaluation. They are also responsible checking on students' behavior and class management. Various teaching strategies used by individual teachers afford students the privilege to full understanding of the contents of instruction being taught by the teachers. Some of the merits of collaborative team teaching strategy are: each teacher plays active role, students perceive both teachers as the same, both teachers participate in the organization and management of classroom, it encourages innovation and creativity and two heads are better than one.”

Indigenous language of instruction is the cultural language of the pupils. It is otherwise known as language of the immediate environment of the pupils. Communication skills as well as language employed in teaching pupils in a class setting is vital and imperative in the achievement of instructional and behavioural objectives of the content being taught. The desire of the teacher is not fulfilled if he fails to impart knowledge to the students. Teaching is not successful when learning has failed most especially in a Mathematics classroom. Teaching and learning are interdependent and inter-related. A good Mathematic teacher cannot conclude that he has taught if his students fail to understand the content of instruction given to them. Instructional language of communication engaged in teaching students is pivotal to the success of otherwise of teaching and learning process of Mathematics. There are some challenges that are peculiar to the teaching and learning in a typical Mathematics classroom. Some of these challenges are: use of technical terms that are peculiar to Mathematics. Such words include Rhombus, Kite, Trapezium e.t.c; use of words that have different meaning in other subjects. For instance, the use of “product” in Mathematics is different from its meaning in other subjects; some mathematical terminologies have precise meanings which are usually misuse in the general world. Also, there are some Mathematical terminologies that inhibit learning Mathematics especially at primary school level of education except the children understand such jargons. Adoption of a medium of instruction in teaching Mathematics concepts most especially at lower primaries as recommended by the National Policy on Education has tendency to overcome most of these challenges thereby improving students’ learning in Mathematics (Adeteju cited in Oyegoke, 2017).

In addition, some of the benefits of using indigenous medium of instruction in teaching Mathematics to basic education pupils as well as illiterate adults are stated by Rutufoundation ((n. d.) and Abiri in Oginni and Owolabi (2013) as follows:

1. It helps the children and illiterate adults to develop mathematical vocabularies in indigenous language
2. Pupils enjoy schools more since they relax and at home using indigenous mode of communication.
3. Pupils learn better and faster since they learn with a language that are familiar to them (Indigenous language)

4. Limited knowledge of foreign mathematical vocabulary is reduced to the barest minimum.
5. Mathematics concepts and examples are brought closer to pupils
6. It improves self-esteem of the pupils
7. Pupils will be able to relate Mathematics concepts to real life situation
8. Parents participation in pupils' school works is encouraged because parents can help their children in school homework and school activities
9. Use of indigenous language reduces pupils' absenteeism in schools.
10. It also enables adults who are not literate in official language to learn and understand mathematics concepts.

In line with this, Oyegoke and Ubani-Roberts (2021) examined the existence of difference in the performance of pupils' taught with mother tongue method (indigenous language) and those taught with conventional method. The study adopted a pre-test, posttest control group quasi experimental design. The population of the study comprised all primary three pupils in South-East Geopolitical zone, Nigeria while the sample used was 414 pupils. The study adopted multi-stage sampling procedure. Two stimulus packages (Mother tongue Instructional Package and Conventional Instructional Package) were developed by the researchers and used as treatments; two instruments MAT (CVI = 0.85;  $r = .89$ ) and MSS (CVI = 0.88;  $r = .87$ ) were developed, validated and used for data collection. The data was analysed using ANCOVA. The findings of the study showed a significant difference in pupils' performance in Mathematics. Pupils taught with indigenous language method ( $F(1, 409) = 1550.221, p < 0.05$ ) had higher performance than their counterparts that were taught with conventional method. The study concludes that mother tongue proved more effective than conventional method. Behrmann (2018) conducted a study to investigate the effect that both Kreyol and French (Kreyol was an indigenous language while French was an official language) as the instructional methods would have on Mathematics and science classes. The population for the study was 246 girls at a private school while 139 were selected as the sample. The sample was divided into 2 groups; a group was taught with Kreyol (indigenous language) while the other group was taught with French (official language). The results showed a significant difference between the French condition and Kreyol condition groups. The mean performance of students taught with Kreyol (indigenous language) was significantly higher than those taught in French. The

results further provide statistical data confirming the important role that Kreyol (indigenous language) played in the improvement of the Haitian education system.

## **STATEMENT OF PROBLEM**

Literature search show that team instructional strategy has influence on teaching and learning of Mathematics. It has also been established that language of communication as an instructional strategy plays a fundamental role in teaching and learning most especially, the teaching and learning of Mathematic concepts. Based on these, various studies have been carried out to investigate the effect of each of these instructional strategies (Collaborative team strategy and Indigenous instructional strategy) on students' achievement in Mathematics. There seems to be no known study that examines the effect of both strategies (Collaborative team strategy and Indigenous instructional strategy) to establish which one more effective in producing better achievement in Mathematics. It is against this backdrop that the present study was set out to establish the effect that the two instructional strategies (Collaborative team strategy and Indigenous instructional strategy) will have of pupils' achievement in Mathematics at basic level of education. The moderating effect of gender was also established in the study.

## **RESEARCH QUESTIONS**

- 1: Which of the instructional strategies recorded the highest mean achievement gain score in Mathematics
- 2: Which of the gender groups recorded the highest mean achievement gain score in Mathematics

## **HYPOTHESES**

- H<sub>01</sub>: There is no main effect of treatment on pupils' achievement in Mathematics
- H<sub>02</sub>: There is no main effect of gender on pupils' achievement in Mathematics
- H<sub>03</sub>: There is no interaction effect of treatment and gender on pupils' achievement in Mathematics.

## **METHODOLOGY**

The design adopted in this study was a pretest-posttest, control group quasi experimental research. A 3 X 2 factorial matrix was used in the study. The variables of the study comprised independent variable, moderating variable and dependent variable. Instructional strategies served as the independent variable and operated as three levels – collaborative team instructional strategy, indigenous instructional strategy and conventional methods. Gender served as the moderating variable and it operated at two levels (male and female) while, pupils’ achievement in Mathematics served as the dependent variable. All primary three pupils in the five states (Anambra, Imo, Abia, Enugu and Ebonyi) of South- East geopolitical zone in Nigeria were used as the target population. A multi-stage sampling technique was used to select subjects that were involved in the study. Two states were randomly selected. The primary schools in each of the three states were clustered according to the local government areas. One local government area was randomly chosen from each of the two selected states making a total of two local government areas. Three (3) primary schools were randomly chosen from each of the selected local government areas making a total of six (6) primary schools. The selected schools were randomly assigned treatments. The intact classes of the selected primary schools were used for the study. The sample size was one hundred and forty-four pupils (144). Pupils in experimental group 1 were taught with collaborative team instructional strategy, pupils in experimental group II were taught with Indigenous instructional strategy while pupils in the control group were taught with conventional method (second language or foreign language without collaboration). Three stimulus treatment packages (Collaborative Team Instructional Package (CTIP), Indigenous Instructional Package (IIP) and Conventional Instructional Package (CIP). Mathematics Achievement Test (MAT) was developed by the researchers and served as a response instrument. The validity of stimulus packages was established with the input of four practicing primary teachers and two experts in the field of educational evaluation. MAT was used to measure the knowledge acquired by the pupils in some selected topics before and after the treatments. It has two sections A and B. Section A consists of pupils’ background information while section B comprised 20-items (multiple choice questions) which were constructed based on the selected topics. The content validity of the MAT was established using Lawshe’s Content Validity Index and it was found to be 0.85 while its reliability coefficient was found to be 0.89

using Kuder - Richardson formula (KR<sub>20</sub>). The data were analysed with Analysis of Covariance (ANCOVA) using pretest as covariates.

## RESULTS

The results are presented based on the order of hypotheses

### Research question 1: Which of the instructional strategies recorded the highest mean achievement gain score in Mathematics

**Table 1: Distribution of Pre- and Post-test Achievement scores of pupils in Mathematics according to Instructional Strategies**

Treatment Groups		Achievement test		Mean gain
		Pre-test	Post-test	
<b>Collaborative</b>	N	42	42	
	Mean	3.83	6.55	2.72
	SD	1.564	1.784	
<b>Indigenous</b>	N	48	48	
	Mean	3.38	7.78	4.40
	SD	1.243	1.781	
<b>Control</b>	N	54	54	
	Mean	2.32	2.89	0.57
	SD	1.324	1.547	

Table 1 shows that the pupils taught using collaborative team strategy recorded a mean pretest achievement score of 3.83 and a mean post-test achievement score of 6.55 while those taught using indigenous instructional strategy had a mean pre-test achievement score of 3.38 and a mean post-test achievement score of 7.78. Pupils taught with conventional method had a mean pre-test achievement score of 2.32 and a mean post-test achievement score of 2.89. In term of achievement mean gain, collaborative team strategy recorded an achievement mean gain of 2.72 (6.55 – 2.83), indigenous instructional strategy recorded an achievement mean gain 4.40 (7.78 – 3.38) of while control recorded an achievement mean gain score of 0.57 (2.89 – 2.32). Hence, with an achievement mean gain of 4.40, pupils in indigenous instructional strategy

recorded the highest mean gain, followed by pupils in collaborative team strategy and conventional respectively

**Research question 2: Which of the gender groups recorded the highest mean achievement gain score in Mathematics**

**Table 2: Distribution of Pre- and Post-test Achievement scores of pupils in Mathematics according to gender**

Treatment Groups		Achievement test		Mean gain
		Pre-test	Post-test	
Male	N	64	64	
	Mean	3.14	5.94	2.80
	SD	1.546	1.567	
Female	N	80	80	
	Mean	3.21	5.54	2.33
	SD			

Table 2 indicates that male pupils recorded a mean pretest achievement score of 3.21 and a mean post-test achievement score of 5.94 and female pupils had a mean pre-test achievement score of 3.21 and a mean post-test achievement score of 5.54. In term of achievement mean gain, male pupils recorded an achievement mean gain of 2.80 and female pupils recorded an achievement mean gain score of 2.33. Hence, with an achievement mean gain of 2.80, male pupils appear to have gained more than pupils. This appear to be consistent with the fact that pupils also recorded higher post -test achievement mean score than pupils

**H<sub>01</sub>: There is no main effect of treatment on pupils' Achievement in Mathematics**

**Table 3: Summary of 3 x 2 Analysis of Covariance (ANCOVA) of Mean Score of Pupils' Achievement in Mathematics by Instructional Strategies and Gender**

Source	Type III Sum of Square	df	Mean Square	F	Sig.	Partial Eta Squared
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<b>Corrected Model</b>	767.191	6	127.865	58.821	.000	.720
<b>Intercept</b>	456.515	1	456.515	210.009	.000	.605
<b>Pretest</b>	7.479	1	7.479	3.440	.066	.024
<b>Treatment</b>	535.452	2	267.726	123.161	.000	.643
<b>Gender</b>	5.596	1	5.596	2.574	.111	.018
<b>treatment * Gender</b>	9.923	2	4.962	2.282	.106	.032
<b>Error</b>	297.809	137	2.174			
<b>Total</b>	5554.000	144				
<b>Corrected Total</b>	1065.000	143				

Table 3 shows the result of the analysis of covariance test on pupils' achievement scores in Mathematics. The table indicates  $F(1,137) = 123.161$ ;  $P < 0.05$ , which implies significant main effect of treatment (collaborative team teaching and indigenous instructional strategy) on pupils' achievement in Mathematics. The null hypothesis 1 was therefore rejected. This is because there was significant difference in the post-test achievement mean score of pupils exposed to Mathematics under Collaborative team, indigenous instruction and control. The Partial eta squared of 0.720 implies that the teaching methods accounts for 72.0% of the observed variance pupils' achievements in Mathematics

**Table 4: Estimated Marginal Means and Standard Error of Instructional Strategies**

<b>Treatment</b>	<b>Number</b>	<b>Mean</b>	<b>Std. Error</b>	<b>95% Confidence Interval</b>	
				<b>Lower Bound</b>	<b>Upper Bound</b>
<b>Collaborative team strategy</b>	42	6.551	.240	6.077	7.025
<b>Indigenous Instructional Strategy</b>	48	7.780	.218	7.349	8.210
<b>Control group</b>	54	2.894	.219	2.462	3.327

Table 4 shows that the treatment group produced a best performance in Mathematics. Table 4 shows the difference in the mean scores of experimental groups (collaborative team strategy, indigenous instructional strategy and the control group). The table shows that the mean score of pupils in indigenous instructional strategy is the highest ( $x = 7.780$ ), followed the mean score of pupils in collaborative team strategy ( $x = 6.551$ ) while those in control group had the least mean score. It could therefore be inferred that pupils with indigenous instructional strategy group had the best achievements in Mathematics, followed by pupils in collaborative team strategy while pupils in control group had the least mean score.

**H<sub>02</sub>: There is no main effect of Gender on pupils' Achievements in Mathematics**

**Table 5: Mean score of pupils' Achievements in Mathematics by Gender**

Gender	Number	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Male	64	5.941 <sup>a</sup>	.185	5.576	6.306
Female	80	5.542 <sup>a</sup>	.167	5.211	5.873

From the result on Table 3, It is indicated that there was no significant main effect of gender on pupils' performance in Mathematics,  $F(1,144) = 2.574$ ;  $P > 0.05$ . The null hypothesis 2 was therefore not rejected. Although, table 5 shows that male pupils had higher achievement in Mathematics than female pupils, the difference in their mean achievement in Mathematics is not statistically significant as indicated in ANCOVA Table 3. Moreover, the partial eta squared of 0.018 indicates no effect of gender on pupils' achievements in Mathematics.

**H<sub>03</sub>: There is no interaction effect of treatment and gender on pupils' achievement in Mathematics.**

The result on table 3 indicates that there was no significant interaction effect of treatment (instructional strategies) and gender on pupils' achievement in Mathematics  $F(1,144) = 2.282$ ;  $P > 0.05$ . The null

hypothesis 3 was therefore not rejected. The Partial eta squared of 0.032 implies that instructional strategies and gender when taken together accounts for 3.2% of the observed variance in pupils' performance in Mathematics which was not statistically significant

## **DISCUSSION OF FINDINGS**

The descriptive statistics showed that at the end of the treatment, positive mean gain in achievement scores were recorded by the three instructional strategy (Collaborative instructional strategy, indigenous instructional strategy and convention instruction

The findings of the study revealed that there was main effect of instructional strategies on pupils' achievement in Mathematics. The instructional strategies were collaborative team strategy, Indigenous instructional strategy and control. Findings of the study showed that, among the two experimental strategies, indigenous instructional strategy had the higher mean post-test gain followed by collaborative team strategy. The conventional method which is the control group came last. This implies that indigenous instructional strategy proved to be the most effective in teaching Mathematics among the three strategies, this strategy is followed by collaborative team strategy while, the convectional method is the least effective. The implication of these findings is that indigenous model of instruction has tendency to overcome some of the challenges associated with teaching and learning of Mathematics thereby enhancing the pupils' learning. This is because in this method of instruction, the teacher translated all the Mathematical content taught into the indigenous language with the help of the indigenous language experts. Each step as well as class examples and evaluations were translated to indigenous language. This package was used in teaching Mathematics to the pupils. With the use of indigenous language of communication in teaching Mathematics, pupils understood the technical terms like cube, kite, that are peculiar to Mathematics. Pupils also understood some of the jargons that have specific meanings in Mathematics different from the way such words were used in the general world. The finding of present study is in tandem with the studies of Oyegoke and Ubani-Roberts (2020) and Adeteju (2014) who investigated the effect of bilingual and engagement on task on pupils' achievement in Mathematics and found that pupils that were exposed to bilingual strategy performed better.

In addition, the findings of the study revealed that the effect of gender on pupils' performance was not significant. By implication, the gender of the pupils whether male or female does not affect their academic achievement in Mathematics. This implies that both male and female pupils benefitted maximally from the teaching strategies used in the study. The strategies did not favour a gender at the expense of the other gender. The strategies catered for all pupils regardless of whether they are males or females. The strategies used in this study were good for gender equality since it was not gender biased. They also enhanced pupils' learning since they removed most of the barriers that are associated with teaching and learning of Mathematics. The finding of this study disagrees with the studies of Amatobi and Amatobi (2013), Oyegoke (2015) and Salman, Yahaya and Adewara (2011) who found that gender plays a significant role in students' achievement.

Furthermore, the finding of the present study showed that the instructional strategies and gender when taken together had no significant effects on pupils' performance in Mathematics. Although instructional strategies had influenced pupils' achievement in Mathematics while gender did not, when taken singly. This means that the effect of gender overpowered that of the treatment since all the pupils benefitted equally from the strategies adopted in this study and neutralized that effect that the strategies had on the pupils' achievement in Mathematics.

## **CONCLUSION**

The study concludes that indigenous instructional strategy is the most effective in promoting pupils' achievement in Mathematics, followed by collaborative team strategy while, conventional method that is mostly adopted by primary school Mathematics teachers is less effective. The study also concludes that both gender of the pupils was adequately catered for by the instructional strategies. The instructional strategies were good to enhance learning for both gender. Thus, pupils' gender is not a factor to be taken into consideration when using the instructional strategies used in this study for in teaching Mathematics in basic level of education.

## **RECOMMENDATIONS**

The study recommends:

- Indigenous instructional strategy and collaborative team strategy should be adopted for teaching Mathematics at Basic level of Education for sustainable development.
- Government should enforce the use of Indigenous instructional strategy and collaborative team strategy in teaching Mathematics especially at lower primaries for sustainable development
- Seminars, workshops, training and re-training programme, should be organized for practicing teachers on the use of the strategies in teaching Mathematics at the basic education level for sustainable development

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