EFFECT OF CONSTRUCTIVIST-BASED INSTRUCTIONAL STRATEGY ONSENIOR SECONDARY SCHOOL STUDENTS' ACADEMIC PERFORMANCE IN MATHEMATICS IN RIVERS STATE, NIGERIA.

By

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Abstract

The study focused on investigated effect of constructivist-based instructional strategy on senior secondary school students' academic performance in Mathematics in Port-Harcourt Metropolis. A quasi-experimental research design of the pretest, post-test non-randomized and non-equivalent control group was used for the study. The study was guided by three (3) research questions and three (3) null hypotheses. A purposive stratified and random sampling technique was used to select three (3) co-educational public secondary schools. A sample of 240 (130 control, 110 experimental) students selected from 3 co-educational schools was used for the study. Two groups were used, one experimental group, and the other one is control group. The experimental group was taught Mathematics with constructivist-based instructional strategy (CBIS), while the other group was taught using conventional method (Problem solving strategy).The instrument for data collection was Mathematics Academic Performance Test on Probability (MAPTP), validated with a reliability coefficient of 0.74 which was obtained through test re-test method. Data collected were analyzed using mean and standard deviation to answer the research questions. Analysis of Covariance (ANCOVA) was used to test hypotheses at 0.05 level of significant.The results showed that the experimental (CBIS) group had higher Mathematics Performance score than those in the control (PSS) group and had a significant difference in their mean scores. It also showed a significant difference in the mean scores of male and female students taught probability using constructivist-based instructional strategy and CBIS favored the male than the femalein performance. The result also showed a significant interaction effect between Gender and instructional strategy in Mathematics academic performance. Recommendations among others are that, teachers should shift from conventional method of teaching and also use constructivist-based instructional strategy to enhance teaching and learning in schools.

Key words: Constructivist-based instructional strategy (CBIS), Problem solving strategy (PSS), Probability, Performance.

Introduction

Mathematics has spread its tentacles in all parts of the world such that people from different works of life see and appreciate its scope and influence in national and human development (Ahumaraeze, 2011). There are many definition of Mathematics. Mathematics is the study of the measurement, relationships and properties of quantities and sets. It is also about logical analysis, deduction, calculation within these patterns and structures (Ekwueme, 2013). While teaching Mathematics one should use the teaching methods, strategies and pedagogic resources that are much more fruitful in gaining adequate responses from the students than we have ever had in the past. The teaching and learning of Mathematics is a complex activity and many factors determine the success of this activity. The nature and quality of instructional material, the presentation of content, the pedagogical

skills of the teacher, the learning environment, the motivation of the students are all important and must be kept in view in any effort to ensure quality in teaching-learning of Mathematics.

In Nigeria, Mathematics is so important that it must be studied everyday a child goes to school, throughout the primary and secondary schools days. This is in line with Federal Ministry of Education ascertain in the National Policy of Education (NPE, 2013).Mathematics is the fulcrum of all science subjects in any educational system of any nation. For a nation to grow or develop in technology, the teaching and learning of Mathematics and science becomes important. There is no science subject, which does not contain an element of Mathematics.The teaching and learning of Mathematics start right from the pre-primary to the tertiary as spelt out in the national policy on education (2004). Among all science subjects, Mathematics serves as the rudiment in which a child's horizon of reasoning and enquiry is expanded. Due to its importance, different educational policies have favored its teaching and learning in all school system. Such policies include 60 to 40 ratios in admission into the Nigerian Universities for science and Arts respectively. Also the failure in Mathematics at the senior secondary certificate examination (SSCE) becomes a deterrent to the study of some professional courses at higher institution system.

The study of Mathematics is quite relevant to modern technology advancement. Its knowledge equips professionals to take a leap into the unknown in order to make life easier and more Comfortable(Ahumaraeze,2011). For example: the Global system of mobile (G S M) Communication. Due to the contribution of Mathematics as a subject, many countries had tried not only to accord it an important subject in their curriculum but have tried to improve its teaching and learning. The Mathematical concept under consideration in this work isProbability; it (Probability) is the branch of Mathematicsthat deals with the likelihood that something or an event will occur; the change that an event will occur from an experiment. It is computed as the ratio of expected outcomes to the total number of outcomes. It can also be expressed as the sample point over the sample space.

Axioms of Probability
  i. $0 \leq P(A) \leq 1$
  ii. If P(A) = 1, then A is a sure event.
  iii. If P(A) = 0, then A is an impossible event.
  iv. If P is the probability of an event A occurring, then $1 - P = Q$ is the probability of the event not occurring.
  v. P + Q = 1 (P is the probability of an event A occurring; Q is the probability of the event not occurring.

Inspite of the important role Mathematics plays in the development of any nation, the performance of students in Mathematics in primary and secondary schools in Nigeria is poor.

Table 1; Result of Senior Secondary School Mathematics Examinations by West Africa Examination Council (WAEC),From 2000 to 2015

Year	% with credit and above (% $A_1 - C_6$)	% with pass and below (% below C_6)
2000	32.81	67.19
2001	36.55	63.45

2002	34.50	65.50
2003	36.91	63.09
2004	34.52	65.42
2005	35.55	64.45
2006	39.92	60.08
2007	15.56	84.44
2008	23.00	77.00
2009	31.00	69.00
2010	24.94	75.06
2011	38.98	61.02
2012	49.00	51.10
2013	36.00	64.00
2014	31.30	68.70
2015	38.00	62.00
2016	52.97	47.03

Source: ABACUS 2015; Usman& Musa (2015) p. 72, Onwuka (2015) p.310.
Table 1 shows the students' results in the senior secondary school examinations organized by West Africa Examination Council (WAEC), from 2000 to 2015.

Instructional strategies are the techniques or methods that a teacher can adopt to meet the various learning objectives. These strategies help students to walk on the path of independent learning and become strategic learners. They equip teachers to make learning fun and help students to awaken their desire to learn. **Strategy involve plan on how to solve a Problem. It is a well-defined procedure used to accomplish a planned specified activities or task.** The performance of students depends seriously on the instructional strategies used by the teachers in the course of teaching and learning. Different strategies have to be embraced to improve understanding. **Teaching strategy is the principles and methods of teaching.**Simply put, a teaching strategy is the way an instructor chooses to convey information and facilitate learning.

This study emphasis the constructivist-based instructional strategy which is a learning strategy based on constructivist theory. In constructivist based instructional strategy, the students are allowed to construct their own knowledge by discovery as a result of being actively involved and participate in the learning process. They (students) are given different assignment to complete which has been broken down according to the objectives of the lesson. **Against this background there is need to try the instructional strategy (constructivist) which could facilitate the Performance of students in Mathematics.**
Constructivism emphasizes the importance of knowledge, belief and skills of an individual in learning. The content of constructivist in Exploration, Proposing explanations/solutions and taking actions helps the teacher shifts from telling and talking to constructivist learning strategy. Constructivist learning strategy has the ability to encourage teachers and curriculum developers alter their perceptions of students. They no longer see students as individual who are irrational, unknowing and ignorant rather, they see them as cognizant beings that are to negotiate, facilitate, mediate, socialize and construct their own ideas (Wikipedia, 2008 & Yeo, His, Jonathan &Ang, 2013 cited inAdaramola, 2014).

According to Adaramola (2014) and Onwuka (2015), Brooks and Brooks (1993) enumerate five important principles of constructivist pedagogy which are:
1. **Proposing problems of emerging relevance;**
2. **Constructing learning around primary concept;**
3. **Seeking and valuing students' point of view;**
4. **Assessing students' learning and**
5. **Adapting curriculum to address students' suppositions.**

When these principles are applied in the Mathematics teaching, it could improve the problem of poor Performances in the secondary schools. Against this background there is need to try the instructional strategy (constructivist-based instructional strategy) which could facilitate the Performance of students in Mathematics.
Statement of the problem

Despite the early start, the subject still poses a threat to the students, which result in a lot of failure as revealed in table 1above. Some students are interested in other sciences and social sciences subjects such as physics, chemistry, economic, and so on, but the element of Mathematics in these subjects put them off. This has caused problems to both parents and students. The persistent annual failure of students in West African Examination Council (WAEC), National Examination Council (NECO) and General certificate examination (GCE) ordinary level is nothing but a limiting factor to students' career choices and a serious threat to technological development in the country. Notwithstanding the place of Mathematics in our society, students still fail Mathematics. Several literatures had shown that students perform poorly in Mathematics and so many researchers have attributed the failure as a result of lack of innovative strategies

However, due to the alarming poor performance of students in WAEC and NECO on yearly bases and researches have shown that teaching Strategy is one of the Problem Confronting the failure, the researcher decided to investigate a possible solution to these problems by investigating theeffect of teaching strategy.One of the strategies that have worked in other countries is the constructivist-based instructional Strategy. This strategy is relatively new, and has been effective in some countries. It can equally apply in Nigeria, hence, the study centered on Constructivist-based instructional strategy on senior secondary school students' Academic Performance in Mathematics.

Aim and Objectives of the study
The aim of this study is toinvestigate the effect of constructivist-based instructional strategy on students'academic performance in Mathematics in Senior Secondary School in Rivers State. Specifically to:
1. Examine the difference between the pre-test and post-test mean score of students in the constructivist-based learning group and those in the Problem Solving learning group.
2. Ascertain the performance of male and female exposed to constructivist based learning strategy and Problem solving learning group.
3. InvestigateInteraction effect between the teaching Strategy (CBIS) and Gender on Students Performance score.

Research Questions
This research was guided with the following research questions

1. What differences exist in the mean performance scores of students taught Mathematics using Constructivist-based Instructional strategy and those taught using Problem Solving strategy?
2. What is the difference in the Performance of male and female students taught Mathematics using constructivist-based instructional strategy(CBIS)?
3. What is the Interaction effect between the teaching Strategy (CBIS) and Gender on Students Performance score?

Hypotheses
The following hypotheses were formulated to guide the study and were tested at 0.05 levelof significance.

HO_1: There is no significant difference in the mean Performance scores of students taught Mathematics using Constructivist-based Instructional strategy and those taught using the Problem solving strategy.

HO_2: There is no significant difference in the Performance of male and female students' taught Mathematics using constructivist-based instructional strategy.

HO_3: There is no significant Interaction between the teaching strategy and gender on students Performance Score.

Methodology
This study employsa quasi-experimental design, which involves a pre-test, post-test, non-randomized, and non-equivalent control group. Intact classes wereused, to avoid disrupting the normal school programs for experimental purpose. According to Nwankwo (2013), a quasi-experimental study is one in which some threats to validity cannot be properly controlled owing to the fact that the situation involves human beings that are being used for the experimental study. Specifically, the study is a Pre-test, Post-test control group design. One group weretaught using the constructivist-based instructional strategy (Experimental) while the other weretaught using problem solving strategy (Control). The problem solving technique is the present approach most teachers use in teaching of Mathematics in Secondary Schools. The treatmentsgiven to the students were in the form of lessons designed to help them perform better.

E: $Q_1 X Q_2$

C: $Q_1 - Q_2$

Where Q_1 = pre-test, Q_2 = post-test, X = treatment, - = no treatment,
E = Experimental group,C = Control group, (-------) = intact class.
Hence: Experimental group, $E = Q_1.X.Q_2$ andControl group, $C = Q_1.-.Q_2$

The population of the study consists of Twelve thousand Two hundred and fifty-six (12256) senior secondary students 2 of the senior secondary schools in Port Harcourt Metropolis of Rivers State (RSSSSB, 2017) which comprise of Twenty-six (26) senior secondary schools. A Purposive sampling technique was used to select three schools for the study. Criteria for the selection include: Presentation of candidates for the Senior Secondary School Certificate Examinations for at least ten consecutive years and each of the schools must have at least two (2) Mathematics teachers of which one of the teachers teaches Mathematics at the senior secondary school 2 class.The sample comprised three co-educational senior secondary

schools in Port Harcourt Metropolis involving a total sample of 240 (two hundred and forty) senior school 2 Mathematics students from the three schools. The sampleswere grouped into two groups, the experimental group, and the control group.

Table 2: Number of Students in the Sample Schools

Schools	Experimental Group		Control Group		Total
	Females	Males	Females	Males	
I	15	15	26	24	80
II	22	13	20	27	82
III	17	28	14	19	78
Total	54	56	60	70	
Sum Total	110		130		240

The selected sample had 110 students for the experimental and 130 students for the control group respectively.

The instrument designed for data collection titled Mathematics Academic Performance Test on Probability (MAPTP) which consists of 20 multiple-choice items, set from the concept of "Probability". The Instrument was developed by the researcher taking into consideration the different aspects of Probability.

Face and content validation of the items in the instrument was done by two experts from the department of measurement and evaluation, University of Port Harcourt since the item questions were drawn from standardized test items from WAEC past questions.The instrument was critically looked at by the expertsand confirmed valid.

The test retest reliability method was used. Correlating the students' response for the 1st and 14th day using Pearson product moment correlationcoefficient statistics, the reliability index of 0.74 was obtained. The instrument Mathematics Academic Performance Test on Probability (MAPTP) was judged reliable for the study. In view of the test and retest done for the data gathering, the post-test question were re-shuffled although retaining its content in order to avoid labeling by the students, when the test was administered again.

The data wasanalyzed through the use of mean, Standard deviation (S.D)for the research questions,The ANCOVA at $P \leq 0.05$ probability levelwasused for the testing of the hypotheses. ANCOVA is appropriate due to the influence of removing the confornding variables that affects the true effect of the independent variable using pre-test as covariate.

Results and Interpretation

Research Question 1: What differences exist in the mean Performance scores of students taught Mathematics using Constructivist-based Instructional strategy (CBIS) and those taught using Problem Solving strategy (PSS)?

Table 3: Mean Performance scoreand Standard Deviation of students taught Mathematics using Constructivist-based Instructional strategy (CBIS) and those taught using Problem Solving strategy (PSS).

Group	N	PRE MAPTP		POST MAPTP		Mean
		Mean	Std. Deviation	Mean	Std. Deviation	Gain
Experimental	110	27.55	15.31	60.14	12.85	32.59
Control	130	28.95	14.88	52.00	13.60	23.05

Total	240	28.31	15.07	55.73	13.84	27.42

Table 3above showed that the mean gain in the experiment group (CBIS) was 32.59 while the mean gain score for the control group was 23.05, with a difference of the mean gain 9.54 which indicate that the experimental group perform better than the control group.

Research Question 2: What is the difference in the Mean Performance scores of male and female students' taught Mathematics using constructivist-based instructional strategy (CBIS)?

Table 4: Mean Performancescoreand Standard Deviation of male and female students' taught Mathematics using constructivist-based instructional strategy (CBIS).

Variable	Gender	N	PRE MAPTP		POST MAPTP		Mean
			Mean	Std.Deviation	Mean	Std. Deviation	Gain
Constructivist-based instructional strategy	Male	56	28.66	15.16	63.36	12.63	34.70
	Female	54	26.39	15.53	56.80	12.32	30.41
	Total	110	27.55	15.31	60.14	12.85	32.59

Table 4indicates that the male students in experimental (CBIS) group performed better than the female in CBIS group with the mean gain of 34.70 against 30.41.

Research Question 3: What is the Interaction effect between the teaching Strategy and Gender on Students Performance Score?

Table 5:Interaction effect between the teaching Strategy and Gender on Students Performance Score

Group	Gender	N	PRE MAPTP		POST MAPTP		Mean
			Mean	Std. Deviation	Mean	Std. Deviation	Gain
Experimental	Male	56	28.66	15.16	63.36	12.63	34.70
	Female	54	26.39	15.53	56.80	12.32	30.41
	Total	110	27.55	15.31	60.14	12.85	32.59
Control	Male	70	28.27	15.01	51.14	13.63	22.87
	Female	60	29.75	14.82	53.00	13.60	23.25
	Total	130	28.95	14.88	52.00	13.60	23.05
Total	Male	126	28.44	15.02	56.57	14.49	28.13
	Female	114	28.16	15.19	54.80	13.09	26.64
	Total	240	28.31	15.07	55.73	13.84	27.42

The table also showed that the mean gain in the learning performance of male students taught Probability using CBIS was 34.70 as opposed to 22.87 of the control group, those taught with PSS, while their female counterparts had 30.41 mean gain as opposed to 23.25, this shows that there has been an appreciable extent of progress in view of the additional scores gained after the post test was administered. It also showed that there is interaction between teaching strategy and gender on students performance Score.

HO_1: There is no significant difference in the mean Performance scores of students taught Mathematics using Constructivist-based Instructional strategy (CBIS)and those taught using the Problem solving strategy (PSS).

Table 6: Summary of ANCOVA of Performance scores of students taught Mathematics using Constructivist-based Instructional strategy (CBIS) and those taught using the

Source	Type III Sum of Squares	Df	Mean Square	F_{cal}	Sig.	Partial Eta Squared
Corrected Model	22534.814[a]	2	11267.407	114.793	.000	.492
Intercept	82453.412	1	82453.412	840.038	.000	.780
PreMAPTP	18590.372	1	18590.372	189.399	.000	.444
Group	**4774.799**	**1**	**4774.799**	**48.646**	**.000**	**.170**
Error	23262.582	237	98.154			
Total	791175.000	240				
Corrected Total	45797.396	239				

Problemsolving strategy (PSS).

Table 6($F1, 237 = 48.646$, $p < 0.05$) shows that there is significant difference in the mean Performance scores of students taught mathematics using constructivist-based instructional strategy and those taught using Problem Solving Strategy.

HO$_2$: There is no significant difference in the mean Performance of male and female students' taught Mathematics using constructivist-based instructional strategy (CBIS).

Table 7: Summary of ANCOVA of Performance scores of male and female students' taught Mathematics using constructivist-based instructional strategy (CBIS).

Source	Type III Sum of Squares	Df	Mean Square	F_{cal}	Sig.	Partial Eta Squared
Corrected Model	7532.557[a]	2	3766.278	38.481	.000	.418
Intercept	55167.650	1	55167.650	563.666	.000	.840
Pre MAPTP	6349.218	1	6349.218	64.872	.000	.377
Gender	**804.740**	**1**	**804.740**	**8.222**	**.005**	**.071**
Error	10472.398	107	97.873			
Total	415807.000	110				
Corrected Total	18004.955	109				

Table 7 revealed that there is significant difference in the mean Performance of male and female students taught mathematics using CBIS ($F1, 107 = 8.222$, $p = 0.005$).

HO$_3$: There is no significant Interaction between the teaching strategy and gender on Students Performance Score.

Table 8:Summary of ANCOVA on Interaction between the teaching strategy and gender on students Performance Score.

Source	Type III Sum of Squares	Df	Mean Square	F_{cal}	Sig.	Partial Eta Squared
Corrected Model	23320.954[a]	4	5830.238	60.957	.000	.509
Intercept	82863.071	1	82863.071	866.366	.000	.787
PreMAPTP	18081.746	1	18081.746	189.052	.000	.446
Group	4658.396	1	4658.396	48.705	.000	.172
Gender	267.519	1	267.519	2.797	.096	.012
Group * Gender	**577.260**	**1**	**577.260**	**6.035**	**.015**	**.025**
Error	22476.442	235	95.644			

Total	791175.000	240				
Corrected Total	45797.396	239				

Table 8, the interaction effect between gender and strategy was significant (F1, 235 = 6.035, p = 0.015). The value of (F1, 235 = 6.035, p = 0.015) shows that with the rejection of the null hypothesis that there is interaction effect between gender and strategy on students Performance score.

Discussion of findings
Effect of teaching strategy on students' academic performance in Probability
The results from table 3 showed that the students mean gain Performance scores among the experimental and control group in the teaching of mathematics (Probability). The experimental group taught with constructivist based instructional strategy (CBIS) had a higher mean gain of 32.59 than the control group taught with problem solving strategy (PSS) which had a mean gain of 23.05. This implies that Constructivist-based instructional strategy facilitated students Performance /Performance better than the Conventional method (Problem Solving Strategy) which is in line with Adaramola (2014). When put to statistical test, the ANCOVA result on Table 4.7 showed a significant difference in the mean Performance scores of students taught using CBIS in the teaching of Mathematics (Probability). The null hypothesis one was rejected at 0.05 level of significance. The present finding was consistent with an earlier finding by Adaramola (2014) which shows that constructivist learning strategyfacilitate students' academic performance.

Onwuka (2015) also supported the position that constructivist-based instructional strategy enhanced students' performance. Sam-Kayode and Salman (2015) also supports the position that further effort on Probability can be enhanced when taught with ludo game as instructional strategy. The findings also support Usman andMusa (2015) that Inquiry method is a teaching method that aided the teaching of Algebra and made it simpler and more understandable to the students and the inquiry learning group performed better than the conventional group.

Effect of Gender on Students academic performance in the teaching of Mathematics using CBIS
Table 4 exposes the facts that male performed better than females in the experimental group (CBIS), they had 34.70gains over their female counterparts who had 30.41 gain. The Performance of the male students was shown to be better than that of the female students. Upon testing statistically, the ANCOVA result on Table 7 showed a significant Gender difference in the Performance of students' taught Probability using CBIS. The result was in line with that of Usman andMusa (2015) in a study titled ''effect of inquiry teaching method on students' Performance in Algebra, where they found out that there was a significant gender difference among the subject of their research and the male students performed better than the female in the inquiry group.

At the same, it is at variance with the finding of Adaramola (2014), Onwuka (2015), Bot andIliya (2015), where it is found that there was no significant gender difference among the subject in Mathematics when they were taught with certain strategies and techniques.
Interaction Effect between teaching strategy and gender
The result in Table 5shows the mean gain Performancescores among the control and experimental group. The mean gain of experimental group on students'Performance was

found to be 32.59 and in terms of Gender (male = 34.70, female = 30.41) while the control group has a mean gain of 23.05 (male = 22.87, female = 23.25). The male in both groups has a mean gain of 28.13 and female has 26.64. The CBIS improved students' Performance both male and female which shows interaction. It shows that there was interaction effect between teaching strategy and Gender. It was further subjected to Statistical testing as shown in Table 8 revealed that there are significant interactions between the teaching strategy and Gender for students' Performance($F1, 235 = 6.035$, $p < 0.05$) in solving problems in Mathematics. This position is supported by Adaramola (2014), Isoboye and John (2015) who found that there is an interaction between the Gender and Strategy on students' performance score and debunksZalmon andNwagor (2015) who revealed that the interaction effect between gender and strategy was not significant.

Summary of major findings

Analysis of the data generated at the end of the study based on the pretest and the post-test as executed showed that:

i.   Constructivist-based instructional strategy enhanced Students Performance better than the Conventional method (Problem Solving Strategy) and there was significant difference in the Performance. This is in agreement with Adaramola (2014), Onwuka (2015), Sam-Kayoda and Salman (2015) who acknowledged constructivist learning strategy as a method that enhance students' performance and opportunity of peer tutoring. It is also in line with UsmanandMusa (2015) who accepted that inquiry method is a teaching method that aided the teaching of Mathematics and made it simpler and more understandable to the students.

ii.   The male students taught Probability with CBIS had a higher mean gain score when compare to their female counterpart, although statistically there was significant gender difference in their results.Gender was found to be significant in this research and male perform better than the female which is in agreement with Usman andMusa (2015). This should debunk the opinion of some researchers such as Adaramola (2014), Onwuka (2015), Bot &Iliya (2015) and Zalmon andNwagor (2015) who said that there is no significant difference in the gender in Mathematics Performancesand Adaramola (2014), Zalmon andNwagor (2015) who said the girls perform better than the boys.

iii. There is an interaction between constructivist-based instructional strategy and gender improved (enhance) students'Performance score. This is supported by Adaramola (2014), Isoboye and John (2015) who believes that constructivist learning strategy could enhance students' performance greatly. It also debunksZalmon andNwagor (2015) who said that the interaction effect between gender and strategy was not significant.

Conclusion

Students in constructivist-based instructional strategy group performed significantly better than their counterparts in the conventional group. CBIS enables students' compute better than the conventional learning strategy (Problem solving strategy). Students areto take responsibility of their own learning if they are to gain from any learning sequence.The constructivist-based instructional strategy enhanced students' performance positively in Probability. CBIS helped students with lower scores earlier to improve and perform better because they learned at their own pace, through their peers by collaboration. The students construct their own knowledge and actively been involved. It is very important in helping

students think out-side conventional forms when faced with challenging mathematical problems. CBIS facilitated students'Performancein mathematics (Probability). It also had a statistical significant effect on students' performance while being taught Probability.

Gender also had a statistical significant effect on students' performance, while being taught Probability using Constructivist-based instructional strategy. CBIS favored the male. Boys are not conversant with the conventional method, if teaching method is always based on this; a significant difference to the advantage of girls will always exist constructivist-based instructional strategy will help the boys compute better.The results show interaction between the instructional strategy and gender in terms of students'Performance.

Recommendations

The following recommendations are made based on the research findings:

i. There should be a shift from conventional method of teaching.

ii. Teachers should use Constructivist-based instructional strategy to enhance teaching and learning in schools.

iii. Gender is not a barrier to the intellectual capacity of either sex, therefore teachers should give equal opportunities for all to participate and be evaluated in all circumstances.

iv. Constructivist-based learning strategy should be encouraged among learner in order to help the weak ones develop rapidly and speedily, it will also encourage team work allow them to construct their own knowledge.

v. The solution to findings by students can be shared through essays, reports or electronically in the form of digital stories, interactive games, video journals, or animated news broadcast. This will help students to express themselves in the language of the subject matter and thus use the right terminologies.

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