
EFFECTS OF COLLABORATIVE AND META-COGNITIVE LEARNING STRATEGIES ON ENGLISH LANGUAGE STUDENTS' ACHIEVEMENT IN READING COMPREHENSION

Ohia, Isaac N. and Ochuba, Onyinyechi Okezie

Curriculum Studies and Educational Technology, University of Port Harcourt, Nigeria

E-mail: Frankey2000@yahoo.com

Abstract: *The study adopted a pre-test, post test, control group, quasi experimental design of a 3X3X2 factorial matrix. A total of two thousand one hundred (2100) students, from fourteen (14) public schools in Obio/Akpor LGA were used. A sample of one hundred and fifty (150) students was selected from three (3) public co-educational secondary schools. The instruments used for this study are the Reading Comprehension Achievement Test ($r = 0.69$). Verbal Ability Test ($r = 0.78$). Instructional Guide on Collaborative Teaching Strategy (IGCTS), Instructional Guide on Meta-cognitive Teaching Strategy (IGMCTS) and Instructional Guide on Conventional Teaching Strategy (IGCTS). Three research questions were stated and a total of seven null hypotheses formulated and tested at 0.05 level of significant. Data collected were analysed using analysis of Covariance (ANCOVA), variance (ANOVA), Scheffe post hoc test. Results showed that there was significant main effect of strategies on students achievement ($F_{(2,147)} = 8.923$; $p < 0.05$; $r^2 = 0.477$) in reading comprehension. The mean achievement scores of students in Collaborative Learning Strategy (CLS) had greater mean achievement score than those of the Meta-Cognitive Learning Strategy (MLS) ($\bar{x} : 18.42 > 14.87$). However, there was no significant main effect of treatment on Verbal ability, gender, on students' achievement in reading comprehension. Based on these findings, it is recommended that teachers of English as a second language should adopt Collaborative Learning Strategy (CLS) and Meta-Cognitive Learning Strategy (MLS) in teaching reading comprehension in order to enhance students understanding and performance.*

Keywords: Collaborative, Meta-Cognitive Learning, Strategies on English Language, Students', Reading Comprehension

INTRODUCTION

The purpose of language is to enable a systematic means of communicating ideas and feelings in human society through words. Mađuekwe (2007), in Yule's (1999) own words, language is the most sophisticated communication tool of life which makes a man. In our present fast moving and digital world, it is apparent that everybody needs to express his thoughts, feelings, ideas, attitudes and actions. Language is a system of distinctive sound and meaning which is learnt or acquired and is used consistently. Language as a tool for social existence, made the society possible for human existence. Individuals either acquire or learn language before use. When one is exposed to a language and he unconsciously internalizes the rules which enables him participate actively in speaking the language of his environment fluently, he is seen as haven acquired the language. However, every child is born with Language Acquisition Device (LAD) while a conscious effort a language learner

makes in order to imbibe another language as a second language after acquiring his first language is seen as language learning, hence language can be categorized according to their use. The importance of English language as a means of communication and as a School Subject is derived mainly from its utilitarian value. Salami (2002) in Oluwole (2008) emphasized the use of English language in improving communication among the various ethnic groups in Nigeria. Since it is the official language for Education, Administration and Commerce as well as a means of making meaning in Science and Technology, in the interpretation of Culture and its differences. English as a second language (ESL) in schools is taught with a lot of challenges. One fundamental assumption, which has affected ESL students' is the teachers' misconception that student are already strong in their mother tongue, especially in primary and secondary schools and have allowed this to influence their teaching of English language. The statistics released by the West African Examination Council showed that less than ten percent of secondary school leavers pass English language at the Credit Level, hence at the tertiary level of education, students have so much difficulty with their Communication skills in English Language, that they are not proficient enough to effectively undertake their undergraduate academic work using English language, especially those with poor background in reading comprehension (Okoro, 2000). The statistics in Table 1 confirm this assertion.

Table 1: Statistics of Entries and Results for SSCE West African Examinations Council WAEC English Language May/June 2001 – 2010.

YEAR	TOTAL ENTRY	TOTAL SAT	TOTAL ABSENT	CREDIT (1-6) [A1-C6]	PASSES (7-8) [P7-P8]	FAIL (9) [F9]
2001	1040101	1025027	15074 [1.45%]	267251 [26.07%]	316767 [30.90%]	441009 [43.02%]
2002	925289	909888	15401 [1.66%]	223568 [24.57%]	299562 [32.81%]	387758 [42.62%]
2003	939507	929271	10236 [1.09%]	269824 [29.04%]	320185 [34.46%]	314225 [33.81%]
2004	844540	833204	11336 [1.34%]	252271 [30.28%]	257954 [30.85%]	323879 [38.3%]
2005	1080162	1064587	15575 [1.44%]	272922 [25.64%]	371095 [34.86%]	393201 [36.93%]
2006	1170523	1154266	16257 [1.39%]	375007 [32.49%]	393994 [34.13%]	342311 [29.66%]
2007	1270137	1252570	17567 [1.38%]	379831 [30.32%]	466378 [37.23%]	379006 [30.26%]
2008	1292910	1274166	18744 [1.45%]	446285 [35.03%]	405942 [31.86%]	400126 [31.40%]
2009	1373009	1355725	17284 [1.26%]	563924 [41.55%]	400424 [29.54%]	3149655 [23.23%]
2010	1331381	1307745	23636 [1.78%]	459404 [35.13%]	407722 [31.18%]	405677 [31.02%]

SOURCE: WAEC RIVERS STATE OFFICE

Table 1 gives a summary of the performance of students in the WASSCE English Language for ten years, (2001 – 2010). The table shows a high failure rate in all the years under review. Within the first five years, the highest percentage of those that obtained credit in the subject (A1–C6) was just 30.28% recorded in 2004 which is about one third of the candidates. In the next five years, the highest percentage of those that had credit in the subject was 41.55%, recorded in 2009. In fact, the entire table showed that the general performance of students is abysmal. The consequence of this poor performance include slow intake of students into higher education in various professional courses, in which English language is a pre-requisite, such as Law, Political Science, Marketing, Science, Engineering, Linguistics and Mass Communication. It means that the inability to understand the English language may also have been responsible for poor performances and drop-out among students in secondary schools in Nigeria, while the demand for English language as a medium of instruction has affected school enrolments. According to Kolawole and Dele (2002), poor literacy and communication in the subject are responsible for students' poor performance. Hassan, (2004) is of the opinion that in many countries where English is used as a medium of instruction, only few speak English language with some degree of competence. Why many read English because ninety percent of information stored in the world mails is written in English language. Therefore, it is the key to unlock opportunities that will open door to expansion of mind which produces new ideas in and outside one's horizon. Since many people are exposed to reading, one would expect that reading should be given a prominent attention but the reverse is the case. The result of WASSCE from 2001 to 2010 clearly confirmed that Nigerian candidates performed poorly, showing that their reading culture and attitude need to be addressed since that is the only medium through which knowledge can be accessed.

Furthermore, the Chief Examiner's Report (2005, 2006, 2007 and 2010) stated that in essay writing students had weaknesses in expression and spelling, they also exhibited difficulties in comprehension passages. Perhaps the way English language is taught in schools and colleges may be responsible for some of the observed lapses in English language achievement and students' skill. Kolawole (1991) blamed the teachers on the use of traditional instructional strategy in the classrooms and lack of good grasp of basic skills in writing. Lawal & Adebileje (2005) asserted that the prominent factor in the trend of poor students' performance in English language is their inability to read let alone comprehend simple English passages. Ofoju (2009) maintained that comprehension of written materials is one of the most fundamental objectives of the school system. Students must read and comprehend their books, instructions, notices, examination questions and so on. The poor performances in English language attributed to lack of innovative teaching skills and responsive attitudinal change among students towards the learning of English language calls for the use of innovative teaching strategies such as the collaborative and meta-cognitive, which will obviate students' difficulties in understanding the language and improve achievements in reading comprehension. Armada, Ismail and Gilakjani (2012) also adopted a meta-cognitive strategy which

involves structural activity that helps the students in using his cognitive and meta-cognitive knowledge in assessing his reading ability. The Learning Reading Strategies (LRS) improves the comprehension proficiency of students in meta-cognition, the process of thinking about one's thinking, and the ability to understand one's own thought processes. Performance of students in reading comprehension can also be influenced by attitude, gender and verbal ability.

The Concept of Meta-Cognition in Learning

Meta-cognition is defined as knowledge about knowing. It takes many forms which include knowledge about when and how to use strategies for learning or for problem solving (Metcalfe & Shimamura, 1994). This concept was introduced by Flavell (1976) as stated:

Meta-cognition is one's knowledge concerning one's own cognitive processes or anything related to them. For example, I am engaging in meta-cognition if I noticed that I am having more trouble learning A than B, if it strikes me that I should check C before accepting it as fact. (p. 32)

There are three distinct components of meta-cognitive such as meta-cognitive knowledge (meta-cognitive experiences), meta-cognitive awareness (what individuals know about themselves) and cognitive processors (the regulation of cognition). In considering meta-cognitive awareness, and meta-cognitive knowledge, Jacobs & Paris (1987) identified three different types of knowledge.

- I. **Declarative knowledge:** This includes knowledge about oneself as a learner, and about what factors that influences one's performance. Garner (1987) asserted that good learners appear to have more knowledge about their own memory and are more likely than poor learners to use what they do know.
- II. **Procedural knowledge:** Procedural knowledge about the execution of procedural skills, individuals with a high degree of procedural knowledge use skills more automatically (Stanovich, 1990). According to Presley, Borkowski & Schneider (1987) a high degree of procedural knowledge can allow individuals to perform tasks more automatically, which is achieved through a large variety of strategies.
- III. **Conditional knowledge:** This refers to knowing when and why one should use declarative and procedural knowledge. This knowledge allows students to select their resources when using strategies (Reynolds, 1992). Furthermore, Reynolds asserted that older children and adults appear better able than younger learners to selectively select their attention based on conditional task demands.

The regulation of cognition and learning experiences through a set of activities that help people control their learning (meta-cognitive regulation) involves some skills which are employed in order to regulate and oversee learning, such as planning, monitoring and

evaluating. Planning activities include predicting outcomes, scheduling strategies, and various forms of vicarious trial and error prior to undertaking a problem while monitoring activities include testing, monitoring, revising and re-scheduling one's strategy for learning and evaluation (checking efficiency and effectiveness). Evaluation makes children evaluate their performance and determine whether they made errors. If children have poor evaluation skills, it follows that their monitoring skills will also be poor. Bayat and Tarmiz (2010) emphasized that the evaluation of the problem is placed at the end of this process, in which the student judges the answer and the process taken to obtain the answer.

The Concept of Collaborative Learning

In order to assist students achieve greater reading comprehension, Springboard (2005) elaborated the different strategies involved in the concept of collaborative learning as shown in Fig. 1.

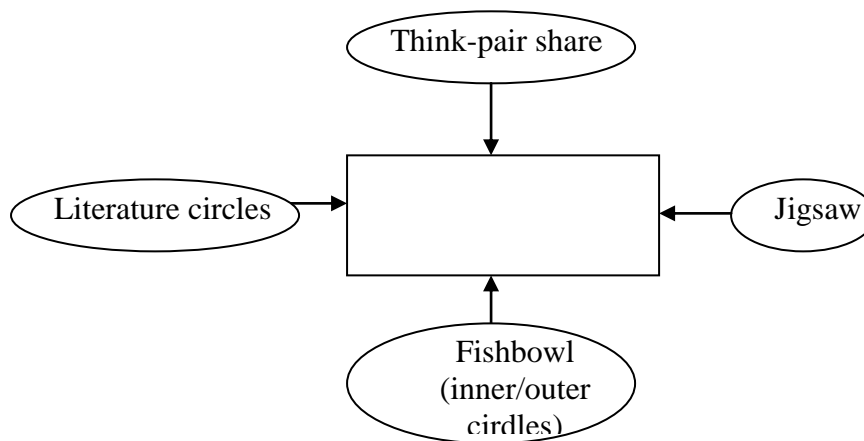


Fig. 1 adopted: Typology of Collaborative Strategies in Learning (Springboard, 2005).

The fishbowl strategy provides students with an opportunity to engage in formal discussion and to experience roles. They also would see textual facts which will be useful in supporting their facts or experiences. But the literature circle is mainly for the provision of opportunity for the students to read, respond to, and interpret a common text. The performance strategy affords critical assessment of demonstration of some parts of the text. The jigsaw technique presents information in summary form to others in a way that facilitates the understanding of a text. Collaborative learning strategy involves active participation of students in the acquisition of their own understanding of concepts. Adebile (2003), Olatunjoye (2003), Olagunju and Ojo (2006) emphasized that teaching and learning involve students activities in order to change their behaviour in a class setting instead of being un-attentive during teaching. Collaborative learning strategy (CLS) in teaching and learning skills increases students' retention and promotes positive relationship that ensures satisfaction with the learning experience and develops skills. Adenuga (2013) asserted that collaborative learning strategy (CLS) is useful in the development and understanding of a new topic. Johnson and Johnson (2006) describe it as a means of providing opportunities for students to learn together as a team in accomplishing a set of goals or objectives. Ogunkunle (2008) and Richards (2005) posit

that meta-cognitive strategies are self-directed learning strategy while the collaborative learning strategy tends to motivate and improve students' learning. An advantage of the students' collaborative effort in learning is that each of the participating students promotes learning and academic achievement by effective contribution to the task (Rahward, 2010). Although reading comprehension may be specifically difficult for students whose primary language is not English, yet the task of reading may also be time consuming hence the following strategies: think-pair-share strategy may be adopted for reading comprehension.

This collaborative learning strategy developed by Legman (1981) involves the stages of THINK PAIR and SHARE.

- a. **Think:** This involves the teacher provoking the students' thinking by using the question while these students would take few minutes to think.
- b. **Pair:** Using nearby neighbours, or a desk mate collaboratively, students pair up to talk about.
- c. **Share:** Teacher calls for pairs to discuss the answers as they are called out.

However, Darling-Hammond, Astin, Orcutt, Martin, Tharp & Palincsar (1999) indicated that the collaborative learning strategy can only be effective where the teacher plays significant roles in helping students learn to work effectively with one another, for example, the simple arrangement of students into groups can make them work together effectively, divide up tasks, share knowledge, listen to each other and rely on each other for help. Cohen & Lotan (1995) asserted that another way to encourage group work is to assign specific roles to group members that are related to how the work is to be done so that there is a clear division of labour and that the complexity of these roles depend on the team work and age of the students. In order to realize what the attitude should reflect, Cohen (1994) also stated that participants in a collaborative task should draw individual strength and describe it as a multiple ability tasks – which allow students to make different contributions and require a variety of skills and behaviour. In this perspective, the weaker students could adopt the acceptable strategy to overcome their learning difficulty. Johnson and Johnson (1999) suggested five characteristics of a truly cooperative group:

- Members see their work as interdependent in terms of the task, roles and resources.
- Each member is personally and individually accountable to do his/her fair share of the work.
- Members use interpersonal and small group skills needed for successful collaborative efforts.
- Conflicting ideas are resolved easily and constructively by participants.
- Members do review their success in group, based on how they are working in synergy.

STATEMENT OF THE PROBLEM

English language is the medium of instruction in secondary schools in Nigeria. The essence of testing students' knowledge in English language is to determine their literacy level and English language proficiency. Despite the importance of the English language to the educational attainment of the students, many students are still not able to read and write in the acceptable language proficiency. This is because Teachers and Learners of English Language have not come to terms with new strategies and modern educational technologies in use in developing countries. The consequence of this poor state of English language teaching and learning is that students are bound to have communication problems, low literacy level in other subjects taught using English language, inability to satisfy their personal and functional language needs and inability to participate fully in the contemporary society as is evident in WASSCE result Table. The introduction of these new strategies will challenge the interest of teachers and students for a better performance. It is against this background that this study will determine the effect of the meta-cognitive learning strategy (MLS) and the collaborative learning strategy (CLS). The role of verbal ability and gender on the dependent variables will also be determined.

PURPOSE OF THE STUDY

The purpose of this study is to investigate the effect of collaborative and meta-cognitive strategies on English in second language (ESL) students' achievement in Reading Comprehension.

Specifically, other Objectives are:

- i. To determine the effect of collaborative learning strategy on students achievements in reading comprehension.
- ii. To determine the effect of meta-cognitive learning strategy on students achievement in reading comprehension
- iii. To determine the effect of gender on students achievement in reading comprehension when taught using the collaborative and meta-cognitive strategies.
- iv. To determine the effect of collaborative and meta-cognition learning strategies on students' achievement on reading comprehension.

Research Questions

- i. What are the effects of collaborative learning strategy (CLS) and metacognitive learning strategy (MLS) on students' achievement in reading comprehension?
- ii. How does the use of collaborative learning strategy (CLS) and metacongitive learning strategy (MLS) affect the achievement of male and female students in reading comprehension?
- iii. Would there be a significant difference in the achievement of students with different verbal abilities?

Research Hypotheses

The following null hypotheses (H_{0i}) were formulated for this study and tested at 0.05 level of significance.

- H₀₁:** There is no significant main effect of treatment of students' achievement in reading comprehension.
- H₀₂:** There is no significant main effect of verbal ability on students' achievement in reading comprehension.
- H₀₃:** There is no significant main effect of gender on students' achievement in reading comprehension.
- H₀₄:** There is no significant interaction effect of treatment and verbal ability on students' achievement in reading comprehension.

SIGNIFICANCE OF THE STUDY

The research findings on the use of collaborative and meta-cognitive strategies on English in second language (ESL) students' achievement in reading comprehension would be useful in improving the teaching approach of teachers in reading comprehension and ameliorate the difficulties students of English face in reading comprehension. It would create a better attention for policy makers and curriculum developers who support the government on effective delivery of the content of the language. It is also expected that at the end of this study, learners in today's knowledge acquisition become creators of knowledge, representing the fruits of their knowledge among themselves, thereby making themselves a resource for one other. Students would see knowledge as an ever unfolding series of problems to be solved. The strategies would go a long way in removing mediocrity in the academic world because students would read and write properly since they would have sufficient knowledge of the subject matter. This would serve as a springboard for knowledge acquisition, ranging from English language to other subjects. This study would give teachers ample opportunities to develop more reading strategies and better reading environment to enhance teaching in school, such that learners would be empowered for better performance. Authors of books and curriculum developers would be in a better position to design, plan and make good policies on education since reading and writing which are hallmarks of knowledge have been diversified.

DELIMITATION OF THE STUDY

This research study is delimited in the use of collaborative and meta-cognitive strategies on English in second language (ESL) students' achievements in reading comprehension and is carried out in co-educational public secondary schools in the research area. It is therefore delimited to Obio/Akpor Local Government Area of Rivers State.

RESEARCH METHODOLOGY

Research Design

This study adopted a pre-test, post-test, control group, quasi-experimental design. The design is schematically presented as:

O₁ X₁ O₂E₁

O₃ X₂ O₄E₂

O₅ X₃ O₆C

Where O₁, O₃, O₅ represent pre-tests

O₂, O₄, O₆ represent post-tests

X₁ represents use of collaborative strategy treatment

X₂ represents use of meta-collaborative strategy treatment

and X₃ represents use of modified lecture method

E₁ represents experimental group 1

E₂ represents experimental group 2

C represents the control group

The study adopted a 3 x 3 x 2 factorial matrix which consists of instructional strategy at three levels (two treatment groups and one control group), moderator variables of verbal ability at three levels (high, average and low) and gender at two levels (male and female). The factorial matrix is shown on table 2.

Table 2: 3 x 3 x 2 Factorial Matrix Indicating Design

Treatment	Verbal ability			Gender
	High	Average	Low	
Experimental group (E ₁)				Male
				Female
Experimental group II (E ₂)				Male
				Female
Control group (C)				Male
				Female

Selection of participants

One hundred and fifty (150) participants were selected from the SS II students in three schools from the population based on the following criteria:

- i. Schools must be co-educational
- ii. Schools must have presented candidates for SSCE for at least two years
- iii. Schools must have qualified teachers at graduate levels
- iv. An intact class to eliminate multiple treatment interference

Instruments

The instrument for the study were the Achievement Test on Reading Comprehension (ATRC) and verbal ability test on Reading Comprehension (VAT). The reliabilities of the instrument were estimated using kuder-Richardson 21 formula as 0.88 and 0.89 respectively. The ATRC consist of standardized questions adopted from the West African School Certificate examination on comprehension and summary while the VAT are multiple choice question on lexis and structure.

Treatment Procedure Pretest

Experimental Group 1 (Collaborative Learning Strategy (CLS). Among the three intact classes, one class will be selected and be exposed to CLS using the following steps:

- Step I: The teacher will explain the CLS to the participants
- Step II: The teacher will make passage available to the students and allow them make their choice.
- Step III: The teacher will allow the students to form groups of about 10 students per group.
- Step IV: Teacher will assign roles to each group
- Step V: Each group will in turn assign roles to group members and will identify a leader in their group.
- Step VI: Students will begin silent students independently in each group on the selected topic.
- Step VII: Student units with their groups will present their assigned role to the group for discussion
- Step VIII: The teacher goes round the class making sure everybody in their group participates.
- Step IX: Teacher presents observations made with questions to the class while group leaders represent their groups in answering the questions.
- Step X: After the observation and questions student regroup again to effect the corrections.

Experimental Group II (Meta-Cognitive Learning Strategy) (MCLS)

Among the three intact classes, one class will be selected and be exposed to MCLS using the following steps.

- Step I: Teacher will expose (MCLS) to the participant
- Step II: Teacher will make passages available to students
- Step III: The teacher points out important words and difficult expression in the passage
- Step IV: The teacher makes the students see the passage as a real life situation so that they think beyond the passage before them.
- Step V: Teacher will go round the class interacting with them to enable them construct meaningful thinking strategy to help them understand the text.
- Step VI: The teacher will ask for students' opinion concerning the text and their understanding.

Step VII: The teacher will ask the students to re-write the text in their own word situating the story to the society.

Experiment Group III; Conventional Teaching Method (CTM)

Among the three intact classes, one class will be selected and be exposed to CTM. The CTM which is the control group will not receive any treatment. They will be taught in the conventional way.

Research Question 1:

What are the effects of collaborative learning strategy (CLS) and meta-cognitive learning strategy (MLS) on students' achievement in reading comprehension?

Table 3: Effects of collaborative learning strategy (CLS) and meta-cognitive learning strategy (MLS) on students' achievement in reading comprehension

GROUP	STRATEGY	Pre-test score (x)	Post-test score (y)	Mean Difference (D)	Percentage Mean Difference (D%)
Experimental	CLS	19.63	38.54	18.91	96.33
	MLS	24.00	37.04	13.04	54.33
Control	CTM	29.32	30.8	1.48	5.05

CLS – Collaborative Learning Strategy
 MLS – Meta-cognitive Learning Strategy
 CTM – Control Teaching Method

Table 3 showed that the mean achievement score of students in the experimental groups (15.97) is greater than the mean achievement score of the control group (1.48). This means that the teaching strategies improved the achievement of students in reading comprehension. The percentage gain score of students taught by the collaborative learning strategy is 96.33% while those exposed to meta-cognitive learning strategy had 54.33% and those treated with the modified lecture method had 5.05%. The table revealed that students who were treated with the collaborative learning strategy (CLS) performed better than those students treated with the metacognitive learning strategy.

Research Question II

How does the use of Collaborative Learning Strategy (CLS) and Metacognitive Learning Strategy (MLS) affect the achievement of male and female students in reading comprehension?

Table 4: Gender and achievement in reading comprehension classified by instructional strategies

GROUP	Strategy	Pre-test score (M)	Post-test score (M)	Pre-test score (M)	Post-test score (M)	Mean Difference (D)	Percentage Mean Difference (D%)
Experimental	CLS	15.81	34.46	22.85	41.27	18.65	18.42
	MLS	22.81	36.00	24.38	39.25	13.19	14.87
Control	CTM	22.96	22.88	36.78	41.39	-0.08	4.61

CLS – Collaborative Learning Strategy

MLS – Meta-cognitive Learning Strategy

CTM – Control Teaching Method

Table 4 showed that there are differential achievement of students on reading comprehension based on gender. In the experimental group female mean score is 16.65 while their score in the control is 4.61 female mean score difference in the collaborative learning strategy (CLS) is greater than their score of their follows in the metacognitive learning strategy (MLS) (18.42>14.87). However the table 4 showed that the male students scores higher than the female counterpart in the collaborative learning strategy (CLS). Male and female in the experimental group performed better than their counterpart in the control group.

Research Question III

How does the verbal abilities of students taught using collaborative learning strategy (CLS) and meta-cognitive learning strategy (MLS) affect their achievement in reading comprehension?

Table 5: Verbal abilities of students and their achievement in reading comprehension classified by the strategies

S/N	Mean verbal ability	CLS	MLS	LTM
i	High	17.14	17.13	20.90
ii.	Average	13.15	9.50	9.45
iii.	Low	9.64	12.00	13.33
Iv	Mean performance scores (D)	18.91	13.04	1.48

Table 5 showed variability in verbal abilities of students exposed to the learning strategies in reading comprehension. Students of high mean verbal ability (17.14) in the collaborative learning strategy (CLS) contributed to the high mean performance score of 18.91 in reading comprehension while those of high mean verbal ability contributed more to the mean performance score of 13.04 in the metacognitive learning strategy. However students of high verbal ability in the lecture teaching method (20.90) contributed to the

mean performance score (1.48) which is considerably low. This means that irrespective of the verbal ability level of students, what is important in improving students' achievement is the teaching method adopted by teachers rather than the proficiency in verbal ability of student.

Data Presentation of Research Hypotheses

Hypothesis 1 (H₀₁):

There is no significant main effects of treatment on students achievement on reading comprehension.

Table 6a: Main effects of treatment on the achievement scores of subjects in reading comprehension Tests of Between-Subjects Effects

Dependent Variable: 1 Achievement in

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	7972.233 ^a	2	185.401	2.250	.040
Intercept	41327.201	1	41327.201	501.506	.000
Main treatment effect	1470.542	2	735.271	8.923	.002
VAT	1718.509	16	107.407	1.303	.301
VAT * Treatment	881.377	10	88.138	1.070	.436
Error	1318.500	16	82.406		
Total	69838.000	150			
Corrected Total	9290.733	147			

a. R Squared = .858 (Adjusted R Squared = .477)

As shown in table 6a, the calculated F ratio at df of 2 and 147 and probability level of 0.05 is 8.923, the F-critical value is 3.00. Since the F-calculated is greater than the F-critical, the null hypothesis is rejected. Hence there is a significant main effect of treatment on the achievement of students in reading comprehension. To determine the actual source of the significant main effect of treatment on students achievement on reading comprehension, Scheffe multiple range test was employed as a post-hoc measure as shown in Table 6a.

Table 6b: Summary of Scheffe post-hoc analysis on achievement mean score of pupils to reading comprehension according to treatment group
Post Hoc Test Treatment
Multiple comparism Reading Comprehension score scheffe

					95% Confidence Interval	
(I) Treatment	(J)	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
CLS	Conventional	5.975	2.3838	.131	-2.134	14.084
		7.500	2.3838	.065	-.609	15.609
Conventional	CLS	-5.975	2.3838	.131	-14.084	2.134
	MLS	1.525	2.3838	.821	-6.584	9.634
MLS	CLS	-7.500	2.3838	.065	-15.609	.609
		-1.525	2.3838	.821	-.9.634	6.584
Conventional						

Based on observed means

The error term is Mean Square (Error) = 56.825.

Table 6b shows that the students performed better when taught using collaborative learning strategy. The mean difference of the Collaborative learning strategy shows that it is the most facilitating in enhancing students performance in reading comprehension followed by the conventional learning strategy then the meta-cognitive learning strategy (MLS).

Hypothesis Two (Ho₂):

There is no significant main effect of verbal ability on students' achievement in reading comprehension.

Table 7a: Summary of ANCOVA on main effects of verbal ability on achievement of subjects in reading comprehension
Test of Between-Subjects Effects
Dependent Variable: I Achievement in

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	7972.233 ^a	2	185.401	2.250	.040
Intercept	41327.201	1	41327.201	501.506	.000
Main treatment effect	1470.542	2	735.271	8.923	.002
VAT	1718.509	16	107.407	1.303	.301
VAT * Treatment	881.377	10	88.138	1.070	.436
Error	1318.500	16	82.406		
Total	69838.000	150			
Corrected Total	9290.733	147			

a. R Squared = .858 (Adjusted R Squared = .477)*p<0.05

Table 7a shows that the F-calculated at df (2,147) is 1.303 while the F-critical is 3.00, hence the null hypothesis is retained. At $P < 0.05$ and df (2,147). There is no significant main effect of the verbal ability of students on their achievement in reading comprehension.

Hypothesis Three (Ho₃):

There is no significant main effect of gender on students achievement in reading comprehension.

Table 7b: Summary of 3 x 2 analysis of variance (ANOVA) of students' achievement in reading comprehension classified by treatments and gender

Tests of Between-Subjects Effects

Measure: Reading Comprehension Score

Transformed Variable: Average

Source	Type III Sum of Squares	Df	Mean Square	F
Intercept	55866.148	2	56866.148	500.362
Gender	496.423	1	496.423	4.368
Achievement	7879.802	41	192.190	1.691
Treatment	39.063	1	39.063	.344
Gender * Achievement	167.911	4	41.978	.369
Gender * Achievement	.000	0		
Error	568,250	147	113,650	

As shown in table 4.7 the F-calculated at df (2,147) is 0.369 while the F-critical value is 3.00. Since the F critical is greater than the F-calculated value, the null hypotheses is retained. At $p < 0.05$ and df 2,147 there is no significant difference between the achievement of the males and females students in reading comprehension.

Hypothesis Four (Ho₄)

There is no significant interaction effect of treatment and verbal ability on students achievement in reading comprehension.

Table 8: Summary of 3 x 2 x 2 ANCOVA on students' achievement and verbal ability on reading
 Texts of Between-Subjects Effects

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	7972.233 ^a	2	185.401	2.250	.040
Intercept	41327.201	1	41327.201	501.506	.000
Treatment	1470.542	2	735.271	8.923	.002
VAT	1718.509	16	107.407	1.303	.301
VAT * Treatment	881.377	10	88.138	1.070	.436
Gender * VAT	2381.361	10	238.136	2.890	.029
Gender * VAT*Treatment	14.561	1	14.561	.177	.680
Error	1318.500	16	82.406		
Total	69838.000	150			
Corrected Total	9290.733	147			

a. R Squared = .858 (Adjusted R Squared = .477)* $p < 0.05$

Table 8 shows that the F-calculated value is 0.070 while the F-critical value is 3.00. Since the F-critical value is greater than the F-calculated value, the null hypothesis is retained. At $p < 0.05$ and df 2,147. There is no significant interaction effect of treatment and verbal ability on students achievement to reading comprehension.

DISCUSSION OF FINDINGS

Effects of instructional strategies on achievement in, and attitude of students towards reading comprehension.

The study revealed that the cooperative learning strategy (CLS) and the metacognitive learning strategy (MLS) have positively affected the students change in behaviour towards reading comprehension as well as improving their achievement. The post-hoc analysis of students' achievement scores showed that those taught using metacognitive learning strategy had a better achievement score than those in the collaborative learning group followed by those in the conventional group in their reading comprehension. This finding agrees with the views of Odumuh (2003) that reading comprehension when properly taught can bring about overall improvement in the quality of education. In the metacognitive teaching approach, students' arrange and plan their own reading activities, make predictions, skimmed between the text and thereby creating self motivation, realizing themselves as learning successfully as the teacher gives adequate direction. Students reading comprehension and attitude to reading comprehension were improved and this is consistent with the views of Ferguson (2001) and Shaw & Wright (1967) in Sithiprom (2012) who applied metacognitive strategies in improving the achievements of students in reading comprehension.

Students verbal ability and achievement in reading comprehension

Comprehension of the language is an essential and integral aspect of meaningful communication hence it is obvious that the students required certain specialized skills in reading to effect better performance. The results of this study showed that there is no significant main effect of students verbal ability on achievement in reading comprehension. Students of high verbal ability have greater mean scores than those of average and low verbal abilities. That students' verbal had no significant influence in students achievement in reading comprehension points to the fact that students do not depend on their verbal ability and this disagrees with the findings of Adelabu (1998) that verbal ability has significant effect on students achievement. However, the study conducted by Jiboka (1990) agrees that there was no significant effect of verbal ability on student achievement in reading comprehension, despite using only two levels of verbal ability rating (high & low). Furthermore, the verbal ability of the students had no interactive effect on their attitude towards reading comprehension. This also agrees with the findings of Igbogo (2011) in which the verbal ability did not influence students' attitude to reading comprehension, significantly. Students need to attach importance to the influence of the teaching strategies rather than their innate quality to understanding concept and improving their reading comprehension.

Students gender and achievement in reading comprehension

The result of this study revealed that no significance of gender differentiation exists in reading comprehension among students in the research area. However, the female students mean achievement score is greater than those of their male counterparts. This findings disagrees with the views of Maitland (2005) who found out that females are superior to males and perform better than male students in language learning, reading and verbal skills. However, the result of the test of hypothesis on gender is contrary to the view of Ariyo & Ugodulunwa (2007) who found no gender disparity in students performance and attributed achievement to other interrelated variables and personal effort other than gender. Conclusively, the use of cooperative learning strategies (CLS) and metacognitive strategy (MLS) have improved students achievement in reading comprehension.

SUMMARY OF FINDINGS

The following results were obtained from the analysis of the research hypotheses and post-hoc analysis.

From the research questions:

1. The mean achievement score of students in the experimental group is greater than the mean achievement score of the control group ($x:15.97 > 1.48$).
2. The male students had a greater mean achievement score than their female counterparts who were exposed to collaborative teaching strategy.
3. The female students taught using metacognitive learning strategy (MLS) had greater scores than their male counterparts ($x:14.87 > 13.19$).

4. Variability occur in verbal abilities of students exposed to the teaching strategies. Students of high verbal ability contributed most to the high mean performance of students in the collaborative learning strategy (CLS).
5. In the lecture method, students high verbal ability did not improve their mean performance score in reading comprehension.

From the research hypothesis

6. The use of collaborative learning system (CLS) and metacognitive learning strategy (MLS) has significantly improved students' achievement in reading comprehension. Students exposed to the collaborative teaching methods have better performance than those of the metacognitive and conventional methods.
7. There is a significant main effect of treatment on the achievement of students in reading comprehension. Hence Schffe post hoc was used.
8. There is no significant main effect on the verbal ability of students on their achievement in reading comprehension.
9. There is no significant difference between the achievement of the male and female students in reading comprehension.
10. There is no significant interaction effect of treatment and verbal ability on students achievement to reading comprehension.
11. There is no significant interaction effect of treatment and gender on students achievement in reading comprehension
12. There is no significant interaction effect of verbal ability and gender on students achievement in reading comprehension
13. There is no significant interaction effect of treatment, verbal ability and gender on students achievement in reading comprehension.

From the post hoc analysis

The collaborative learning strategy (CLS) is most facilitating in enhancing the achievement of students in reading comprehension as shown in table 6b.

CONCLUSION

In order to develop English reading comprehension abilities, Meta-cognitive Learning Strategies (MLS) and Collaborative Learning Strategies (CLS) are valuable. From the findings of this study, these methods have provided some practical ways and means of improving reading and comprehension. Furthermore, the attitude of students towards the learning of any concept in reading comprehension affects their achievement. The variability of individuals between and among members of a cooperative setting can affect their achievement. The use of metacongitive strategies (MLS) improved their achievement towards learning in reading comprehension.

RECOMMENDATIONS

The following recommendations are made based on the findings of this study.

- Teachers of English as a second language should adopt use of Metacognitive Learning Strategy (MLS) in teaching reading comprehension in order to enhance students performance. It also affords students the satisfaction with their studies and proper integration of the activities proposed by their teachers who guide and facilitate the learning process.
- Students should be allowed to learn collaboratively, by adoption of the Collaborative Learning Strategy (CLS) in reading comprehension in order to enhance sharing of ideas and foster better understanding of the concepts and improved achievement in their reading comprehension.

CONTRIBUTIONS TO KNOWLEDGE

This study has revealed that the use of metacongitive learning strategy (MLS) and collaborative learning strategy (CLS) can be effectively used to remedy students' poor performance in reading comprehension in English language. The performance of students in reading comprehension can be enhanced by the use of the Collaborative Learning Strategy (CLS).

REFERENCES

- Adenuga, A. O. (2013). Self directed learning and cooperative learning strategies on junior secondary school students' learning outcomes in Fine Art. *Unpublished post-field report for Ph.D. award*, University of Ibadan, Ibadan.
- Ariyo, A. O. (2007). Effects of gender differences and class intervals on the attitude of Nigerian senior secondary school students I and II, towards physics. www.ajol.info.
- Bayat, S. & Tarmizi, R. A. (2010). Assessing cognitive and metacognitive strategies during problem solving. *Procedia social and behavioural sciences* 8(403-410).
- Cohen (1994). *Designing group work: strategies for the heterogeneous classroom*. New York: Teachers College Press.
- Cohen, E. & Lotan, R. (1995). Providing equal status interaction in the heterogeneous classroom. *American educational research journal*, 32 (1) 99 – 120.
- Darling-Hammond, L. (2007). Race, Inequality and educational accountability: The irony of "No child left behind". *Race, ethnicity and education*, 10(3) 245 – 260.
- Darling-Hammond, L., Austin, K., Orcutt, S. Martin, D.; Tharp, R. & Palinscar, A. (1999). *The learning classroom. Learning from others: Learning in a social context*. School of education Stanford University, Stanford.

- Garner, R. and Alexander, P. A. (1989). Metacognition: Answered and unanswered questions, *Educational psychology* 24(143-158).
- Jacobs, J. E. & Paris, S. G. (1987). Children's metacognition about reading: *Issues in definition, measurement and instruction educational psychologist* 22(225-278).
- Johnson, D. W. & Johnson, R. T. (1999). Cooperative learning and basic elements of cooperative learning in learning together and alone. *Cooperative, comparative and individualistic learning pp* (13-47).
- Kolawole, C. O. O. & Dele, A. (2012). An examination of the national policy of language education in Nigeria and its implications for the teaching and learning of the English language: *Ibadan journal of education studies*, 2(1) 12-20.
- Kolawole, C.O.O. (1991). University of Ibadan Post graduate language students' evaluation of some syntactic errors in written English. *Unpublished M.Ed. thesis University of Ibadan, Ibadan.*
- Lawal, R. A. & Adebileje, A. O. (2005). *Visual literacy and the use of advance organizers in reading comprehension lessons*. In Data, A & C.O.O. Kolawole (Eds). Issues in language, communication and education. Ibadan: Counstellation Books 9.
- Metcalfe, J. & Shimamura, A. P. (1994). *Metacognitive: Knowing about knowing*. Cambridge, MA: MIT Press.
- Ođumuh, T. D. (2003). Diversification of English language comprehension passages and the impact of secondary school students language performance. *Journal of the conference organization of Nigeria* 10(1) 21-26.
- Ofođu, O. G. & Oluwole, D. A (2008). The impact of mother tongue on students' achievement in English language in Junior Secondary Certificate Examination in Western Nigeria. *Journal of School Sciences* 17(1) 41-49.
- Ofođu, O. G. (2011). Related effects of school location, class levels and gender on reading needs of secondary school students in Nigeria. *African Research Review*, 5(6) 36-42.
- Okoro, D. C. U. (2000). Basic education emerging issues, challenges and constraints in the state of education in Nigeria. *A publication of UNESCO Nigeria, Abuja* (34-35).
- Presley, M; Borkowski, J. G. & Schneider, W. (1987). Cognitive strategies, good strategy users coordinate metacognition and knowledge. *Annals of Child Development* (5).

- Rahvard, J. Z. (2010). Cooperative learning strategies and reading comprehension. *California linguistic notes* volume xxxv (2) 2 – 15.
- Reynold, R. E. (1992). Selective attention and prose learning: theoretical and empirical research. *Educational psychology review* 4(345-391).
- Stanovich, K. E. (1990). Concepts in developmental theories of reading skill: cognitive resources, automaticity and modularity. *Developmental revolution* 10(72-100).
- WAEC (2005). Chief examiners report. *West African Examination Council, (2-7)*.

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Biographical Note: Isaac N. Ohia is a senior lecturer at the University of Ibadan. He is of the Department of Teacher Education Language Unit. He is currently doing his sabbatical at the University of Port Harcourt.

Biographical Note: Ochuba O. O. is a lecturer II at the University of Port Harcourt. She is currently in the Department of Educational Technology (Language Education).
