



**ASSESSING THE EFFECT OF COMBINED JIGSAW-MASTERY LEARNING
TEACHING STRATEGY ON SENIOR SECONDARY YEAR2 STUDENTS'
ACADEMIC ACHIEVEMENT IN READING COMPREHENSION.**

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Abstract

This study assessed the effect of combined Jigsaw-mastery learning teaching strategy on senior secondary school year2 students' academic achievement in reading comprehension. The study adopted a quasi-experimental design. One research question was posed, and one hypothesis formulated to guide the study. The population of the study is comprised of 7,903 students (3,483 male and 4420 female). Purposive sampling technique was adopted in selecting the sample. The sample of the study was made up of 87 students comprising 43 students assigned to the experimental groups and 44 students assigned to the control group. The instruments for this study were 30 items multiple-choice Reading Comprehension Achievement Test (RCAT). Mean and standard deviation were used to answer the two research questions while ANCOVA was used to test the hypothesis at $p < 0.05$. The result revealed that students taught using combined Jigsaw-mastery learning teaching strategy had a higher academic achievement gain score than those taught using lecture method. Based on the findings some recommendations were made which include among others that there should be a review in the current instructional procedure to accommodate the combined Jigsaw-mastery learning teaching strategy in senior secondary teaching syllabus, to reduce the poor academic performance of students.

Keywords: Combined, Jigsaw-mastery, learning strategy, Academic achievement, Reading comprehension.

1.0 Introduction

Reading comprehension is defined as the level of understanding of a text/message (Eke, 2018a). Reading comprehension is a highly interactive process that takes place between a reader and a text. Individual learner/reader will bring variable levels of skills and experiences to these interactions. These include language skills, cognitive resources, and world knowledge. Act of reading meaning in a text occurs within a particular socio-cultural and emotional context. This includes the reader's cultural background, their previous motivation, their view of themselves as a reader, the purpose of reading the text, the cultural value placed on reading and the reader's environments. All these variables determine comprehension in reading. Comprehension is a "creative, multifaceted process" dependent upon four language skills: phonology, syntax, semantics, and pragmatics (Eke, 2018b). Proficient reading depends on the ability to recognize words quickly and effortlessly (Eke, Ugonna & Nwachukwu, 2020). It is also determined by an individual's cognitive development, which is "the construction of thought processes". Without comprehension, reading is simply following words on a page from left to right while sounding them out without making meaning of the words. And while people read for many different reasons, the main aim of reading is to derive understanding of what the writer is conveying and to make use of that information to: gathering facts, learning new skills or for pleasure. That is why reading comprehension is so important without it the reader cannot gather information and use it effectively to

function and enjoy the richness of life be it in academics, profession, socially and so on.

The lack of strong reading comprehension skills obviously affects a student's success in school and their general understanding and comprehension of their environment and the people. This is because most people who cannot read have a limited and stereotyped perception of people around them and the environment. Also, academic progress depends on understanding, analyzing, and applying the information gathered through reading. But it goes much further than that, poor comprehension skills have been linked to poverty and crime (Eke, 2018b). This is because most people who cannot read are highly limited in this dynamic global digital information era. They tend to resist situations/people that will challenge their illiteracy. Reading comprehension empowers learners to take individual as well as collective informed action in various contexts of their everyday life, such as household, workplace, community, and global social community and are likely to subscribe to global best practices.

Reading comprehension is considered as the real core for successful academic endeavor as students need to read and comprehend in any subject to excel. Teaching students with effective reading comprehension skill must be teacher's highest priority. Yet, in Nigeria many scholars observed that this aspect of language learning is highly neglected and may have been one of the major reasons for students' poor academic achievement in secondary schools (Adeyimi, 2008; Agwamba, 2014, Eke, 2018a). According to WAEC State Committee (2021) statistics of

result performance May/June West African Senior School Certificate Examination (WASSCE) for Nigeria on the percentage of number of students, that have five credits pass and above including English Language and Mathematics from the year 2017 to 2019. 2019- 37.6%, 2018- 36.57%, 2017 – 31.00% (West Africa Examination Council 2017-2019). These shows a declining trend in students' performance. The poor performance of students in primary, secondary, and tertiary institutions could be attributed to students' lack of effective reading comprehension skills (Onukaogu, 2002 & Ofodu, 2009). This may also have indirectly linked to high crime rate among the youth. As some youths who could not pass the required level of credit pass to gain admission in tertiary institution or to be gainfully employed, may choose the life of crime because of frustration of not having adequate credit pass.

The observed poor performance of students may be attributed to several factors, one of which is the use of poor, ineffective traditional method in teaching. Confirming the interrelationship between methods used in teaching and student' academic achievement Nwigwe and Izuagba (2011) asserts that method used in teaching can stimulate interest and zeal to learn or destroy interest.

Also, studies have indicated that teachers in Nigerian secondary schools use lecture method in lesson delivery (Izuagba, 2011, Eke, 2018b, & Eke, Ugonna and Nwachukwu, 2020). Lecture method allows a great deal of information to be passed on and favours handling of large classes. Despite this advantage, the lecture method does not stimulate students' innovation, critical

thinking, inquiry, interpersonal skills and scientific attitudes. It encourages students to cram facts which are easily forgotten. It also encourages unhealthy competition among students (Mbakwem, 2005). It could be that appropriate teaching strategies that will make students proficient with the skills for reading comprehension have not yet been adopted in teaching in Nigerian secondary school. It is considering this that this work investigated the effect of combined jigsaw teaching strategy with mastery learning on senior secondary school students' academic achievement in reading comprehension.

Jigsaw teaching strategy stems from the constructivists' approach to learning. Constructivism is a view of learning based on the belief that knowledge is not given by the teacher rather it is constructed by learners through an active and collaborative process. In other words, learners are the builders and creators of meaning and knowledge and that knowledge is socially constructed. Knowledge therefore results from the activity taken by the learner usually in a problem – solving activity, and from reflections on those actions. The main feature of constructivist theory is that it focuses on the learner; learners take responsibility for learning; they become architects of their learning process; the environment is learner – centered (Okudo, 2013). In using this strategy, every student's task is an integral part of which implies if a student fails to successfully complete his/her task, it affects his/her group's performance and consequently the whole class performance. For instance, students in a class of 20 are divided into 5 groups of 4 students in each group and each of these groups will be given any distinctive names like: Chelsea, Gunners.

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The Bulls –this first grouping is referred to as the “home group”. The teacher assigns numbers to each of the 20 students in the class and the numbering must tally with the number of questions they are to answer. For example, if they are to answer four questions, the teacher gives them number in this sequence; 1, 2, 3, 4; 1, 2, 3, 4; 1, 2, 3, 4, in that order till the last person.

The teacher then asked the entire number one to form a new group, all the number two to form a new group etc in that order. This present group which they have formed is called “expert group”. This is because they will be assigned the task of finding the correct answer to a particular problem\challenge in the task. The task for each expert group must tally with their number. At the end of the task, which is usually timed, they will be expected to return to their home group to teach\explain clearly what they have learnt in their expert group. In their home group, each group will have answers to questions 1 to 4 and number of the home group that returned from their expert group takes turn to explain the answers to the questions to his or her group. The teacher monitors the discussions after which he/she finally asked questions that may fall within and beyond the initial four jigsaw questions as the students would have understood the whole passage having read and analyzed the passage in their different expert group.

Jigsaw teaching strategy has been found very effective in helping students to be equipped with basic skills that will enhance reading comprehension as it exposes learners to problem-solving activity and reflection on academic action, that help learners to easily

make meaning in reading. This enhances academic achievement of learners in school subjects. It also encourages interpersonal relationship as it encourages listening, engagement, negotiation, interaction, peer teaching and cooperation (Adeyimi, 2008 & Onkoba, 2014, Eke, 2018b).

Mastery learning is an instructional process that provides students with multiple opportunities to demonstrate content mastery (Robinson, 2011). It is distinctive compared to the traditional method of teaching in that the unit of material is taught and students' comprehension is assessed before they are allowed to move on to the next unit. MLS involves breaking down the subject matter to be learned into units of learning, each with its own objectives. The strategy allows students to study material unit after unit until they master it (Ram & Shrutee, 2019). Mastery of each unit is shown when the student acquires the set pass mark of a diagnostic test. MLS helps the student to acquire prerequisite skills to move to the next unit. The teacher also is required to do task analysis and state the objectives before designating the activities. MLS can help the teacher to know students' area of weakness and correct it thus breaking the cycle of failure. Results from research studies carried out on MLS suggest that MLS yields better retention and transfer of knowledge in various subjects than non-mastery learning strategy (Ram and Shrutee, 2019). Other research studies report similar findings (Ngesa, 2012; Wachanga & Gamba, 2014) MLS has the unique quality of enabling mastery of content by the student through supplementary instruction and corrective activities of small units of the subject matter. MLS also requires the teacher

to do task analysis, thereby becoming better prepared to teach the units.

The available researches did not indicate any research on the effectiveness of combined jigsaw-mastery learning strategy in SS English language reading comprehension. This research study was therefore intended to fill this gap in the body of knowledge.

1.1 Combined jigsaw mastery learning instructional teaching class.

a) In the context of this study, the jigsaw-mastery learning teacher starts the lesson by presenting an overview of what the unit would entail in a simple form and divided the students into groups

b) Students are asked to work on pre-test problems that will involve them to interact to solve the task. And each individual student is allowed to interpret meaning from the given task and contribute to solving the given task. The pre-test score will be the basis for the teacher to determine group division, which are called as Study Groups.

c) Study groups were determined manually by the teacher by considering the heterogeneity, gender, and pre-test scores.

d) The teacher provides topics to be studied (4-5 topics), which will be the basis for the number of Expert Groups; Secondly, he/she would explain to the students what information is to be learned and how he/she expect the students to answer the expected task. And the criterion for pass mark.

e) Students in a study group are divided into sub-groups, and every individual student in the group is allowed to give answer to the task

and interact within the group members on the answer given as to have different views on the answer given.

f) An Expert Group discussion forum consists of students from different Study Group to discuss a topic, ask questions among themselves, and do exercises that have been prepared by the teacher.

g) The students then return to their previous study group, explain, or share material that has been studied on the expert group by writing explanation of concepts through different discussion forums according to the topics. Other members of the study group ask questions, while the expert answers. After the completion of sharing process, the students are asked to do exercises on the topics.

h) At the individual test stage, the students work on a test which covers all the topics that have been provided by the teacher. Students who are deemed to have mastered the learning unit can proceed to a new learning unit or be allowed to carry out further enriching activities. On the other hand, students who have not mastered the learning unit will be required to undergo remedial instruction. (Adapted from ADDIE model (Analysis, Design, Development, Implementation, Evaluation, Dwi, Ishafit, & Firdausy, 2013).

It appears that combined jigsaw-mastery learning is among those instructional strategies that enhance emotional intelligence in addition to cognitive intelligence. It makes for positive changes in academic achievement and quality of the lives of the students (Yazici, Seyis & Altun, 2011). It is

on this note that this study investigated the effect of combined jigsaw mastery learning strategy on SSS students' academic achievement in reading comprehension.

1.2 Purpose of the Study

The purpose of the study was to determine the effects of combined jigsaw mastery learning and lecture method of teaching on senior secondary school year 2 students' academic achievement in reading comprehension. Specifically, the study sought to:

1. Find out the differential effect of combined jigsaw-mastery learning teaching strategy and Lecture teaching methods on senior secondary school year 2 students' academic achievement in reading comprehension.

1.3 Research Question

The following research question guide the study:

1. What is the differential effect of combined jigsaw mastery learning teaching strategy and Lecture teaching methods on senior secondary school year2 students' academic achievement in reading comprehension?

To guide the study, this hypothesis was formulated and tested at 0.05 level of significance:

HO₁: There is no significant difference in the post-test (RCAT) mean achievement scores of senior secondary school year 2 students taught reading comprehension using combined Jigsaw mastery learning teaching strategy and lecture teaching method.

2.0 Method

This study adopted a pre-test, post-test, control group experimental design with a 2 x 2 factorial matrix to determine the effects of training in combined jigsaw-mastery learning strategy and lecture method on students' academic achievement in reading comprehension. The experimental group adopted combined jigsaw-mastery learning strategy and the control group used the lecture method. The population of the study comprised all the senior secondary school two (SS2) English Language students in all the Government owned co-educational Secondary schools in Abia State in the 2021/2022 academic session numbering 7,903 students (3,483 male and 4420 female students) in Abia State (Abia State Secondary Education Management Board, 2022).

The SS II Students of Ndume Otuka Community Secondary School was purposively selected as the sample. Ndume Otuka Community Secondary School is one of the co-educational public secondary schools in Umuahia Education Zone. The sample of the study consists of 87 students comprising 43 students assigned to the experimental groups and 44 students assigned to the control group from the same school. One class for experimental group has 19 males and 24 females (JMLTS) while the other class for control group has 15 males and 29 females. The instrument for this research was Reading Comprehension Achievement Test (RCAT) which consists of 30 multiple-choice questions. Constructed with the collaboration of senior secondary school English language teachers. The Pre-test Post-test achievements test items was based on the unit topics that consist of reading

comprehension in English language that was taught to the students.

The face and content validity were established for the Reading Comprehension Achievement Test (RCAT) Forms 1 and 11. To ensure the face validity of the Reading Comprehension Achievement Tests (RCAT), they were presented to three specialists in Measurement and Evaluation and English language from Michael Okpara University of Agriculture, and an expert in Curriculum Studies from Alvan Ikoku Federal Collage of Education. The content validity of the Reading Comprehension Achievement Tests (RCAT) Forms 1 and 11 were ensured through the use of the test blueprints and item analysis. Thereafter, the test items generated were sent to an expert in Curriculum Studies with English language background from Alvan Ikoku Federal College of Education, two experts in Measurement and Evaluation from Michael Okpara University of Agriculture, Umudike for comments and suggestions. The reliability of the Reading Comprehension Achievement Test (RCAT) was 0.87. The instrument was subjected to trial testing. The Reading Comprehension

Achievement Test (RCAT) instrument was administered to 30 students who were not sampled for the study. The scores obtained from the trial testing were subjected to Kuder-Richardson (KR-20) formular to determine the internal consistency of the Reading Comprehension Achievement Test. The Kuder- Richardson (KR-20) was appropriate for determining the reliability of the Reading Comprehension Achievement Test because the instrument required only one correct answer in every case. The scores obtain from the pre-test and post-test were analyzed using mean and standard deviation to answer the research question while analysis of covariance (ANCOVA) was employed for testing the hypothesis.

The following decision rules were applied: For the analyses of research question:

Accept any variable which computed mean is from 2.5 and above and reject any variable that has below the cut-of mean of 2.5.

For the testing of hypothesis: If p value is less than 0.05 the Null hypotheses was rejected but if P value is greater than 0.05 the Null hypotheses was retained.

Table 1: Pre-test and posttest mean score and standard deviations scores of SS2 students in reading comprehension when taught using combined jigsaw mastery learning and lecture method.

Teaching Method	Number of Students	Type of Tests				Achievement Gains	
		Pre-test		Post test		Effect	
		\bar{X}	S.D	\bar{X}	S.D		
CJML Method	43	16.50	4.13	36.02	7.21	19.52	8.4

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Lecture Method	44	16.09	4.07	27.21	5.01	11.12
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The data presented on Table 1. Indicated that students taught using CJML strategy had a mean achievement score of 16.50 and a standard deviation of 4.13 in the pre-test and a mean of 36.02 and a standard deviation of 7.21 in the post-test with a pre-test post-test gain of 19.52. The data also showed that students taught using the Lecture method had a mean score of 16.09 and a standard derivation of 4.07 in the pre-test and a mean score of 27.21 and a standard deviation of 5.01 in the post test, making a pre-test posttest gain to be 11.12. The findings reveal that students taught reading comprehension with combined jigsaw mastery learning teaching strategy had a higher mean achievement gain score than those taught with Lecture method of teaching. That is to

say that combined jigsaw-mastery learning strategy had better effect of 8.4 over lecture method of teaching.

The finding of this study is consistent with research relevant to positive effects of jigsaw teaching strategy and mastery learning, Dembo, 2010; Adeyimi, 2008; Wachanga & Gamba, 201 4; Onkoba, 2014; Eke, 2018a and Eke, Ugonna & Nwachukwu 2020.

Hypotheses 1: There is no significant difference in the post-test (RCAT) mean achievement scores of senior secondary school year 2 students taught reading comprehension using combined Jigsaw mastery learning teaching strategy and lecture teaching method.

Table 2: Analysis of covariance (ANCOVA) for Reading Comprehension Achievement Test mean scores of SS2 students when taught using combined jigsaw-mastery learning teaching strategy (CJMLTS) and lecture method

Sources of Variation	Type II sum of square	Df.	Mean sum of square	F.	Significance
Correlated model	4575.340 ^a	2	2387.670	114.824	.000
Intercept	2236.533	1	2236.533	107.556	.000
Pre-test	696.827.541	1	699.828	33.655	.000
Teaching method	3214.526	1	3214.528	154.588	.000
Error	1601.174	100	20.794		
Total	79521.000	103			
Corrected total	6275.418				

a. R square = .746 (adjusted R squared = 0.764)

The data on Table 2 shows that the teaching methods (CJMLTS and Lecture method) are significant factor in the mean achievement scores of the students in the Reading

Comprehension Achievement Test. This is because the p-value of 0.00 is less than 0.05. This indicates that we reject the null hypothesis which states that there is no

significant difference in the post-test (RCAT) mean achievement scores of senior secondary school year 2 students taught reading comprehension using combined Jigsaw mastery learning teaching strategy and lecture teaching method. Thus, this implies that there is significant difference between the mean achievement scores of senior secondary school year 2 students taught reading comprehension using combined Jigsaw mastery learning teaching strategy and those taught using lecture teaching methods. The result revealed that CJMLTS is an efficient teaching method that blended pedagogy delivery with individual mastery of instructional content. It also embedded in its instructional procedures and instructional interactions which encourages listening, engagement, negotiation, collaboration, peer teaching and cooperation. And give each member of the group an essential part to play in the academic activity. This result agrees with Wachanga & Gamba, 2004; Onkoba, 2014; Eke, 2018a and Eke, Ugonna & Nwachukwu 2020 that jigsaw teaching strategy and mastering learning teaching strategy have positive effect in enhancing students' academic achievement over lecture method of teaching.

3.0 Conclusion

This study was carried out to investigate the effect of combined jigsaw-mastery learning teaching strategy and lecture methods of teaching on SS2 students' academic achievement in Reading Comprehension. The result of the study shows that students exposed to combined jigsaw-mastery learning teaching strategy had a higher mean academic achievement score gain than their peers exposed to lecture method of teaching.

4.0 Recommendations

Based on the findings of the study, the following were recommended by the researchers.

- 1 Teaching with combined jigsaw-mastery learning teaching strategy is different from that of ordinary traditional (Lecture) teaching. As a result of this, teacher educators should engage in self-training around blending jigsaw-mastery teaching strategy in pedagogy delivery. This is because combined jigsaw-mastery learning teaching strategy can go a long way to enhanced students' academic achievement.
- 2 Efforts should be made by curriculum expert to incorporate combined Jigsaw-mastery learning strategy into teaching in secondary schools.
- 3 Teaching with Jigsaw is different from ordinary traditional teaching. As a result of this, Secondary school teachers should be trained and versed on how best to develop and use the Jigsaw strategy to achieve its objective of enhancing achievement.
- 4 The result of this study underscores the need for Abia State Government in Secondary Schools (Secondary School Education Management Board SCMB) to organize workshops for schoolteachers to acquire and learn more effective teaching methods.

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