

**Influence of Audio File as a Digital Interactive Multimodal Reading Strategy on, Academic Performance, Motivation and Retention of students of the University of Port Harcourt, in Reading Comprehension**  
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**Abstract**

*The study investigated the effects of Digital Interactive Multimodal Reading strategy (audio) on students' academic performance, motivation and retention in reading comprehension using a quasi-experimental design of pre-test, post-test control type and descriptive survey on 80 University students' selected randomly from a population of 600 students in English Studies, year II of the University of Port Harcourt. Three research questions and three hypotheses were used to determine the course of the research while the instruments for the study were Modified Multimodal Reading Motivation Questionnaire (MMRMQ) and Students Performance Test on Reading Comprehension (SPTRC). The reliability coefficients of 0.82 and 0.78 were obtained using Kuder-Richardson 21(KR- 21) formula. The instruments were validated by two experts in English Studies and one expert in the measurement and evaluation unit of the University of Port Harcourt. Data obtained using MMRMQ and SPTRC were analyzed using the descriptive statistics of mean (mean percentage) and inferential statistics of*

*analysis of covariance (ANCOVA). Findings show that there is a significant difference between students' retention in reading comprehension when taught using audio file as a Digital Interactive Multimodal Reading strategy and those taught using conventional Lecture Method (CLM). However there is no significant difference between students' motivation and performance, when taught using Digital Interactive Multimodal Reading strategy (audio) and those taught using conventional Lecture Method (CLM). Based on these findings, it is recommended that Digital Interactive Multimodal Reading strategy (audio) be used in teaching reading in higher institutions in order to improve students' retention of materials read..*

## **Introduction**

Comprehension is the process of simultaneously extracting and constructing meaning through interaction and involvement with written language. An active, complex, long-term developmental, cognitive process of acquiring knowledge, of enhancing understanding, of constructing meaning that involves knowledge, experience, thinking, and teaching, understanding beyond knowing. Comprehension is not a product of reading. Rather, it requires purposeful, thoughtful, and active interactions between the reader, the text, the activity, and the sociocultural context. It is a complex cognitive process that requires an intentional and thoughtful interaction between the reader and text ;Blevins (2014).It means that to comprehend or grasp a concept, learners must be aware of the use and meaning of words (vocabulary), ability to analyze, take in information, in a cohesive and accurate manner. Learners of English Language are versed with the importance of interaction in language development and how well the concept learned are applied. The learners output is measured in terms of fluency, which is a mix of learners' competence and performance hence comprehension can be identified as an interactive, strategic and well developed process (Hill, 2011)

- i) The concept of comprehension among L2 learners can be classified into many types; Literal comprehension – the straight forward meaning of the text's literal meaning of words which builds the sentences would systematically create a whole in understanding the text (Day & Park, 2005)
- ii) Reorganization which occurs when readers garner various information and combine them for additional understanding.
- iii) Inference – learners go beyond literal understanding, here they use their own knowledge in order to proffer solution to an existing problem. (Day & Park,2005)
- iv) Prediction and Evaluation – This requires the readers use of their prior knowledge. For learner evaluation on a comprehension passage, the general knowledge of the topic under discussion and understanding of materials is importantly required.

Comprehension among learners is affected by some factors. Gabe (2010) and Gibson (2010) opined in different discuss that fluency in comprehension would require implicit learning and reading practice instead of the overt and explicit language instruction inherent in the classroom. In terms of lexical processing, Hill (2010) added that the lexical-semantic processing of words is the gainful concern of learners in comprehension than the syntactic processing of words. The lexico-semantic processing of words deals with what words mean in context. The comprehension of any topic therefore requires learners' understanding of the contextual meaning of words.

Chang (2010) added that minor delays in recognizing word meanings will result in poor comprehension. Effects of cultural factors on L2 comprehension have been studied by (Brantmeter, 2003; Erten & Razi, 2009). They asserted that it is useful to apply cultural materials in order to implement innovative approaches to reading comprehension. The problems of culture can also be explained as the ability to interpret multi-cultural information in view of the learners' cultural background.

Considering e-learning comprehension, Kang, Wang, and Lin's (2009) study had provided evidence that learners involved in e-reading process are more accurate in their comprehension abilities than the traditional reading methods. However, some readers argue that e-reading has certain psychological disadvantages such as increased susceptibility to eye fatigue (Kang *et al*; 2008). According to Hill (2013), the advantage of e-reading in textual comprehension is for easy recall, strategy use and better comprehension processing.

Teaching methods in comprehension can also affect learners' abilities. For example Yang (2002) suggested that comprehension should be monitored, that means knowing from a passage what is done wrong or right and to integrate new information based on learners prior knowledge.

Some teachers also adopted the Bottom-up approach and top-down approaches. These methods break words into their meanings before integrating it into the learners lexicon while in the top-down approaches, the text overall theme is understood in order to grasp the isolated words and sounds. Reading strategy is the intentional use of a cognitive process that involves selection, execution and monitoring.' Academic reading on paper is a challenging exercise and it becomes even more complex when it is done in digital spaces,(Julian 2018) Proficiency in digital multimodal reading has become a vital skill which the 21<sup>st</sup> century learner must have in order to operate and function effectively, (Coiro, 2011a; Coscarelli & Coiro, 2015). To be proficient in a digital multimodal environment, students must be able to locate information, comprehend, synthesize and evaluate the infinite resources available online.

The availability of academic resources on the web and the growing number of students who are now turning to the online environment for reading materials has made it imperative for students to be taught how to effectively read online. According to a recent research, young adults between ages 18-29 years old are likely to read digital books on different types of devices and formats,(Perrin 2018).It was also found out that this group is likely to read electronic books for assignments, school works and

research, (Barajas-Murphy 2017) Students prefer online or electronic texts due to portability, cost, currency and requirements on the course. Singer and Alexander (2017b) discovered that the length of materials read impacted on the performance of the learners. They found that participants who read texts that were longer than a page did not perform as well as the those who read the printed texts and therefore concluded that for students to process digital texts effectively, the text has to be broken into reasonable fragments (page 1028).

Though materials abound on how to teach children and teens how to read in digital space, very few materials exist on how adults can read online. Fortunately, the skills that support deep and engaged reading for younger learners can be used by adults as well and some of the tools like annotating, questioning and summarizing used for engaged reading with printed text are equally useful with digital texts, (Korbey 2014). Engaged and deep reading suited to reading for academic purposes demands that students read actively by reading with questions and searching for answers to those questions, building connections with previous learning and the new information. Another major skill needed to read digital texts effectively is the ability to remain focused on the material read avoiding distractions which is inherent in digital platforms. The SQ3R technique can also be applied to digital text. This acronym means Survey, question, read, recite and review. It is a critical thinking skill which allows learners think deeply about what they read.

Skilled readers are not only able to decode and comprehend information from the materials read, they also are able to effectively use reading strategies that help them to take control of their reading, (Park & Kim, 2011; Poole, 2008). This means that they employ various strategies that allow them monitor and modify their reading for effective comprehension.

According to Brown (1980), skilled readers are able to make use of the following strategies in order to achieve effective comprehension. (1) Goal setting or clarification of reading purpose, (2). Identification of important parts of the message, (3) focusing more on relevant information, (4) self

monitoring for effective comprehension,(5) engaging in self reviews and testing,(6)making adjustments and modifications where necessary and (7)recovering from distractions and disruptions. While these strategies may not be applied all at the same time, skilled readers select and use the most appropriate strategies for specific reading needs and goals. These strategies are well suited to reading in digital spaces as it affords the reader the opportunity of being deeply engaged in reading which is required in reading for academic purposes.

Certain digital tools can be useful in helping students engage in deep reading. For speed reading, applications like the *spreeder*, reader can control the display features and the number of words to be displayed at a time. The *beeline reader* displays different text colour which changes from one sentence to the other. This can be motivating to readers.

Since note taking is one of the reading strategies students must use effectively, there are certain annotation applications that may enhance their note taking skills. *Google docs* provides students with flexibility of adding and removing notes when needed. *Adobe Acrobat* allows students to use sticky notes, and highlights to comment on Pdf files while *Hypethes. is* an application that allows students share their thoughts through the collaborative function available on it. *Lucidchat* being a mind mapping tool affords students the opportunity of visually presenting their ideas and also capture brain storming sessions. Students can use *Quizlet* software to frame questions based on the material read,(Julian 2018).With or without applications, the fact remains that reading in digital spaces involves purposeful and engaged reading activities in order to get the most out of the reading material.

Digital multimodal literacy improves quality knowledge acquisition. Learners are exposed to information in a large scale from different but relevant sources. It is required that those who acquire these new knowledge would be able to apply same in problem solving, ability to converse one's understanding or experience to others and get deeply interested in learning using the digital approach (Gibbs, 1992., Duke, 1992). This type of

knowledge can be acquired through university education where the demand for students' analyses and synthesis level is considerably high and based on the nature of different learning skills adopted by them during the learning process. Despite attaining critical thinking, analytical as well as ability to communicate, the essential student learning outcome in all educational levels are classified as practical and intellectual skills; knowledge of natural and physical world as well as human cultures; applied and integrative learning, social and personal responsibility (Kuh, 2013).

The university undergraduate is therefore being trained to acquire the needed interpersonal skills in order to foster the ability to know, communicate and show competency in any literary demand to meet the demands of education in the university. Bourner, Heath and Rospigliosi (2013) emphasized the main goals of university education as the higher educational advancement of knowledge, rendering of services to those who are out of the four walls of the university. This expectation from students would warrant teaching in the universities to incorporate programs that would guarantee knowledge, skills and attitude.

Moreover, the concept of digital multimodal literacy emanated from behavioural change of readers resulting from the improved utility to appreciation of communication technology systems in reading. These readers have preference to screen reading against textual reading. Multimodal literacy discourse became imperative in order to describe the shifts in students' conceptualization of learning paradigm in an age of increased digital communication (Kress & Van – Leeuwen, 2006). Students have a changing attitude from showing vigour in reading textual materials to quick learning of a range of textual materials using digital technology. Walsh (2009) explained that these students make use of a range of technology with a variety of digital media and mobile technology to surf the internet, send text messages or photo, play software games, listen to music and use of multimodal texts through hybrid texts such as weblogs. The consequences of this attitudinal change and long term adaptation to

digital cognitive abilities of learners compared with those found reading and writing traditional print-based texts become a challenge to pedagogical shift and modes for classroom communication.

In classroom communications for example, Kress, Jewit, Ogborn & Tsatsarelis (2001) looked at the multimodal environments of science classroom while Jewit (2002) examined those environments in English language classrooms, where literacy were mediated through more varied technologies including digital communication devices, social networking, inter-netting, among others. The excitement students have and readiness to seek for information can improve their meta-cognitive learning approach where they are likely to have an in-depth conceptual understanding.

The various multimodal reading strategies are the use of images, Bookraps, use of blogs, learning by design and multi-literacy framework. Researchers' for example, Unsworth, Thomas & Bush (2004) investigated the way images are used in standardized texts while Simpson (2005) posited that Bookraps can be used for effective teaching using online communication. Moreso, students are also guided to produce multimodal texts as a way of creating literacy program where more print based materials can be incorporated into digital texts for better conceptual understanding of reading and writing.

## **1.2 Statement of the Problem**

There is a general lack of interest in reading printed materials though university students have increased use of information communication and technology devices for internet browsing, reading and communication. This has led to a shift of interest from reading the printed text to digital texts on the screen. The availability of useful materials online make it even more attractive to students and other users. Digital texts play an increasingly important role in students' studies and research, given their accessibility and affordability but this has not been fully utilized by the teachers and students in English studies.

Digital texts provide a new resource for English as foreign/ second language (EFL/ESL) learners and present new challenges that can impact



seriously on how individuals comprehend. Reading in a Digital Interactive Multimodal environment where audio files are also used could be challenging and distracting in one hand while enhancing and improving comprehension on the other. It is also believed that audio files could improve the reception, coding and encoding of information in the audio- and audio-visual representations which can substantiate learning and bring meaning to reading, more than the traditional use of printed materials only. It is therefore the interest of this researcher to find out whether the use of audio files as a digital interactive multimodal reading strategy would bring about a positive change of attitude (motivation) towards reading, to improve performance and retention.

### **1.3 Aim and objective of the study**

The aim of the study is to determine the influence of Audio files as a digital interactive multimodal reading strategies on student's motivation, performance and retention in reading comprehension. Specifically, the objectives of the study are to:

- i. Determine the effects of Digital Interactive Multimodal Reading (audios) on motivation of students in reading comprehension.
- ii. Investigate the influence of Digital Interactive Multimodal Reading (audios) on student's performance in reading comprehension.
- iii. Investigate how Digital Interactive Multimodal Reading Strategy (audios) can enhance students' retention in reading comprehension.

### **1.4 Research Questions**

The following research questions were stated to guide the study.

- i. How does the Digital Interactive Multimodal Reading Strategy (audios) enhance students' motivation in reading comprehension?
- ii. What is the influence of Digital Interactive Multimodal Reading Strategy (audios) in enhancing students' performance in reading comprehension?

- iii. How does Digital Interactive Multimodal Reading Strategy (audios) enhance students' retention in reading comprehension?

### **1.5 Research Hypotheses**

**Hypothesis One H<sub>01</sub>:** There is no significant difference between students motivation mean scores, taught using Digital Interactive Reading Multimodal (audios) and those taught using conventional strategy.

**Hypothesis Two (H<sub>02</sub>):** There is no significant difference between mean scores of students performance taught using Digital Interactive Reading Multimodal (audios) and those taught using conventional Lecture Method, in reading comprehension.

**Hypotheses Three (H<sub>03</sub>):** There is no significant difference between the mean scores of students' retention taught using Digital Interactive Reading Multimodal (audios) and those taught using conventional Lecture Method, in reading comprehension.

### **1.6 Significance of the study**

The findings of this study is of significance to the students who engage so much in digital spaces while carrying out their studies. The capabilities of the audio files found in digital spaces is believed to enhance interaction and capable of improving their motivation, performance and retention. The use of audios in teaching excites the auditory capacity of the learners, in terms of attention and application of learnt materials. Teachers' benefit on this innovative method is the pedagogical shift to educational technology and use of ICT. Educational planners in the higher education unit and the universities would see the need to improve on infrastructures for learning such as the equipment the language laboratory software's to ease learning process.

### **1.7 Conceptual Review/Theoretical Framework**

Digital literacy entails that a learner must be able to use a wide range of digital tools for various educational purposes. In recent years, most of the readings done by students is online and this means they must have the

required digital literacy skills in order to carry out effective learning. The skills learners should have include the ability to use audio files and videos for academic purposes. Audio files are useful for learning in several ways. Kuhn & Stahl, 2003 identified improvements in learners attitude towards reading after using audiobook with the students. Listening to English Language affords the students the opportunity to hear the Language and visualize what the words depict(Beers,1998).Audio books enable struggling readers to complete a book which in turn boosts the confidence of the reader leading to a positive attitude towards reading(Gander, 2013). If properly utilized, audio books technology can help in achieving beneficial outcomes in comprehension skills, vocabulary and syntactic development(Lane &Wright 2007) Audiobooks are most effective if it is used with the written text(Holum & Gahala 2001,Whittingham et al, 2012). Reading the text version of the audio book at the same time allow the students the opportunity to pay more attention to the story instead of trying to decode the words while matching sounds as modelled by a fluent reader in the audio book. This enhances both phonological skills as well as the comprehension skills of the learner thus increasing the enjoyment of the material read(Wagar 2016).This research intends to apply the use of audio files and text in reading for academic purpose to see how it impacts on the motivation, retention and achievement in reading comprehension.

The main theories underlying the study are the cognitive theory of Multimedia learning and social constructivist theory and connectivism. The multimedia theory recommends the two separate channels of processing of information auditory and visual processing. Although each channel has its limitation, they form the bulk of active process of filtering, selection, organizing and integration of information based on prior knowledge. According to Mayer & Moreno (2003) the topic of learning through a design process is to provide coherence using verbal and pictorial cues in order to guide the learners to select relevant words for a single processing channel. Vigotsky's theory of social constructivist theory states that knowledge is co-constructed and that individuals learn from one to

another. This means that learner's must be engaged in the learning process and that learning occur due to social interactive. The essence of using a scaffold such as that of the audio modes is to achieve learners attention and activity, listening, jotting and appropriating techniques to carry out tasks.

### **Methodology**

The study adopted a quasi-experimental design of the pre-test-post test, control design and descriptive survey on 40 university of Port Harcourt undergraduates in an intact class. Two instructional strategies adopted are the use of Digital Interactive Multimodal Reading Strategy (audio) and the conventional Lecture Method (CLM). The undergraduates are in year II of English studies department. The instruments used for the study are the Modified Multimodal Reading Motivation Questionnaire (MMRMQ) designed by Smith/Cavanaugh & Moore (2011). MMRMQ consist of 20 items weighted in Likert four point scale of SA (4marks), A (3marks), SD (2marks) and D (1mark), and the Students' Achievement Test on Reading Comprehension (SATRC) which consists of a comprehension passage on the "processing of cassava-Garri" for local consumption as pretest and the clayey soil as the Students Achievement Test on Reading Comprehension(SATRC) as post test ,where students' reading ability, memorization, vocabulary knowledge, comprehension knowledge, performance and retention are measured. The reliability coefficients of the instruments are 0.82 and 0.78 respectively. The face validity and construct validity were determined by experts in measurement evaluation, and an expert in English as a Foreign Language (EFL).

The experimental group was taught reading using the Digital Interactive Multimodal Reading Strategy (audio) while the control group was taught reading using the conventional Lecture method (CLM). Instructional packages were designed using lesson plans showing activities of students in a Digital Interactive Multimodal Reading strategy specifying the nature and perspective activity of the teacher. The responses on the MMRMQ and SATRC were analyzed using the descriptive mean analysis of (& mean

percentage) to proffer answers to the stated research questions while the inferential statistics of analysis of variance (ANOVA) and analysis of covariance (ANCOVA) were used to test the hypotheses at 0.05 of significance.

## Results and Discussion

**Research Question 1:** How does the Digital Interactive Multimodal Strategy (Audio) enhance students' motivation in reading comprehension?

Group	Pretest Score	Mean Motivation Scores (m)	Post Test scores	Mean Motivation gain	Gain %
Experimental DIMS (Audios)	19.03	60.50	20.23	4.57	7.5
Control CIM	14.13	55.93	15.62		

### *CRM-conventional Lecture Method*

### *DIMRS- Digital Interactive Multimodal Reading Strategy*

Table 1.1 shows students mean motivation score of 60.50 in the experimental group (DIMRS, Audios) and 55.93 in the control group (CLM). The mean Motivation difference of 4.57 indicate that students have enhanced motivation to interact in Digital Multimodal Reading Strategy (audios) in learning reading comprehension by about 7.55% in the experimental group than the control group.

**Research Question II:** What is the influence of Digital Interactive Multimodal Reading Strategy (Audios) enhancing student's performance in reading comprehension?

Group	Mean Pretest Score	Mean Post Test Scores	Mean Difference (Gain)	% Gain Difference	% Gain
Experimental DIMS (Audios)	19.03	20.23	1.20	0.35	22.58
Control CIM	14.13	15.68	1.55		

Table 1.2 shows that the mean posttest scores of the experimental group (DIMRS, audios) is 20.23 while that of the mean pretest score is 19.03. The mean difference between tests is 1.20. Similarly, in the control group, the mean post test score is 15.68 while that of the pretest is 14.13 giving a mean difference of 1.55. The table 4.8 revealed that students in the control group had a greater gain (mean difference) than those in the experimental group ( $1.55 > 1.20$ ) at gain % of 22.58.

**Research Question III:** How do Digital Interactive Multimodal Reading Strategy (audios) enhance students retention in reading comprehension?

**Table 1.3:** Digital Interactive Multimodal Strategy (Audios) and students' Retention in reading comprehension.

Group	Mean Post test Score	Mean Delayed Posttest Score (Retention)	Gain	Gain Difference (D)	% Gain Difference
Experimental DIMRS (Audio)	20.23	22.98	2.75	0.13	41.09
Control CIM	14.13	15.75	1.62		

Table 1.3 shows that the mean post test score of the experimental group (DMR) Audios) is 20.23 while the students' score in the delayed post test

score is 22.98. The gain of 2.75 shows that the delayed post test score is greater than the post test score (22.98 >20.23).

The control group (CLM) had pretest of 14.13 while the delayed post test score was 15.75. A Gain of 1.62 was obtained gain mean percentage of 41.09% indicates that students had enhanced retention reading comprehension when taught using Digital Interactive Multimodal Reading Strategy (audios). The experimental groups had greater mean scores in terms of motivation performance and retention in reading comprehension than the control group.

### Test of Hypotheses

#### 1.5 Research Hypotheses

**H<sub>0</sub>1:** There is no significant difference between students motivation mean sores, taught using Digital Interactive Reading Multimodal (audios) and those taught using conventional strategy.

**Table 5: t-test statistics on students’ motivation when taught using digital interactive Digital Interactive Reading Multimodal (audios) and those taught using conventional strategy.**

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
MOTIVATION 2	Equal variances assumed	3.109	.082	1.947	78	.055	4.92500	2.52917	-.11020	9.96020

Equal variances not assumed		1.9 47	59.95 1	.056	4.9250 0	2.52917	-.1341 8	9.98418
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Table 5 shows that the t-calculated value is 1.947 at df (78). While t-theoretical value is 1.980. since the t-calculated value is less than t-theoretical value, the null hypothesis is retained. Hence there is no significant difference in motivation of students in reading comprehension taught using Digital Interactive Multimodal Reading Strategy (audio) and those taught using the conventional lecture method.

**Hypothesis Two (H<sub>02</sub>):** There is no significant difference between mean scores of students performance taught using Digital Interactive Reading Multimodal (audios) and those taught using conventional Lecture Method, in reading comprehension.

**Table 6: Analysis of covariance (ANCOVA) of students performance**  
Tests of Between-Subjects Effects

Dependent Variable: POSTEST2

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	172.836 <sup>a</sup>	2	86.418	7.086	.001	.155
Intercept	1335.319	1	1335.319	109.486	.000	.587
PRETEST1	127.836	1	127.836	10.482	.002	.120
TREATMENT 2	32.913	1	32.913	2.699	.105	.034
Error	939.114	77	12.196			
Total	34650.000	80				
Corrected Total	1111.950	79				

a. R Squared = .155 (Adjusted R Squared = .133)



Table 6 indicates that the F-calculated ratio is 2.699 at df (2, 79) while the F-critical value is 3.07. Hence, the null hypothesis that there is no significant difference between mean scores of students performance taught using Digital Interactive Reading Multimodal (audios) and those taught using conventional Lecture Method, in reading comprehension, is retained or upheld.

**Hypotheses Three (H<sub>03</sub>):** There is no significant difference between the mean scores of students' retention taught using Digital Interactive Reading Multimodal (audios) and those taught using conventional Lecture Method, in reading comprehension.

**Table 7: Analysis of covariance of students' retention when taught using Digital Interactive Reading Multimodal (audios) and those taught using conventional Lecture Method, in reading comprehension**

**Tests of Between-Subjects Effects**

Dependent Variable: RETENTION2

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	456.761 <sup>a</sup>	2	228.380	14.778	.000
Intercept	1579.857	1	1579.857	102.227	.000
PRETEST1	5.511	1	5.511	.357	.552
TREATMENT2	439.790	1	439.790	28.457	.000
Error	1189.989	77	15.454		
Total	27928.000	80			
Corrected Total	1646.750	79			

a. R Squared = .277 (Adjusted R Squared = .259)

Table 7 shows that the F-calculated value is 28.457 while the F-critical value at df (2, 79) is 3.07. The F-calculated value is greater than the F-critical value ( $28.457 > 2.79$ ) hence the null hypothesis of no significant difference between the mean scores of students' retention taught using Digital Interactive Reading Multimodal (audios) and those taught using conventional Lecture Method, in reading comprehension is rejected. There is a significant difference between the mean scores of students' retention taught using Digital Interactive Reading Multimodal (audios) and those taught using conventional Lecture Method, in reading comprehension.

### **Discussion of Findings**

The findings of this study agree with Becta (2011) that a confirmation of audio-visual aids used to substitute monotonous learning environment and print materials to remedy students difficulties, performance and retention in reading. The findings also in coherence with that of Gilakani, Ismail & Ahmadi (2011) that multimodal learning and second language acquisition brings about meaningful, cognitive and critical understandings. In most studies, the audio is combined with the video interactively in audio-visual aids used in EFL classroom among 15 undergraduates showed result of effective use of the audio-visual aids and that students find the strategy useful and relevant when mediated with lesson content. However, the finding agrees with McEneaney (2003) that application of technology in education did not significantly relate with interest in reading and increase in students performance.

### **Conclusion**

The use of Digital Interactive Multimodal Reading Strategy (audio) is statistically significant in improving students' motivation, performance and retention in reading comprehension among undergraduate students in the University of Port Harcourt.

## Recommendations

Based on the findings of this study, it is recommendation that teachers use of conventional Lecture Method in teaching reading is insignificant and should be replaced with the use of innovative strategies such as the Digital Interactive Multimodal Reading Strategies which include audio modes in teaching for effective retention of materials presented to students in the classroom.

Secondly, the Digital Multimodal platform is advantageous in exposing students to numerous readable materials and information with the interaction of written text modes and pictorial representations. Students' motivation and retention are enhanced through this interactivity hence should be used in collaborative learning of reading in order to enhance active participation of learners in acquisition of their knowledge.

## Contribution to Knowledge

Digital Interactive Multimodal Reading Strategy (audio) is statistically significant in enhancing students' motivation, performance and retention in reading comprehension among students. It is found to enhance students' retention of materials read which will lead to their ability to easily retrieve information for use during the learning process.

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