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Effects of Interactive Digital Instruction for Explicit Fluency on Senior Secondary Two Students' Reading Comprehension Performance in Kontagora Local Government Area, Niger State, Nigeria

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ABSTRACT

The study focused on the effects of Interactive Digital Instruction for Explicit Fluency on Reading Comprehension Performance of Senior Secondary Two Students in Kontagora Local Government Area of Niger State. The study was guided by two research questions and two hypotheses. The quasi-experimental design was used for the study. The total population of the study was 1,867 students, from which a sample size of 174 was drawn using the simple random sampling technique. A 30-item multiple choice Reading Comprehension Performance Test (RCPT) was used to gather data. Descriptive statistics (Mean and Standard Deviation) were used to answer the research questions and the five hypotheses were then tested using t-test statistics at the 0.05 level of significance. The result showed that the students' performance in the pre-test was poor, indicating that the students had poor background. The results also showed that the students' performance in answering reading comprehension questions in the experimental group was significantly higher in the post-test than in the control group. The study found that interactive digital instruction for fluency positively influences the performance of students in reading comprehension of Kontagora Local Government Area, Niger State. The study recommended the integration of Interactive Digital Instruction by the ministry of education into the curriculum for training of Senior Secondary two Students in Kontagora Local Government of Niger state, Nigeria, in order to enhance students' performance in reading comprehension.

Keywords: Interactive digital instruction, explicit fluency, and reading comprehension

Introduction

In secondary schools, the field of education has drastically changed as a result of technological advancements. A new generation of students, known as "digital natives," have emerged in the twenty-first century and are at ease in a world of communication and immersion. In order to remain relevant in this day and age, education must include technology and discover methods to use it in the classroom to fulfil students' requirements. The English language is not an exception in this situation; in fact, reading comprehension and fluency are notably impacted. Students may employ interactive digital training, which connects them with English native speakers, as one of the technological strategies to assist them gain fluency and comprehend reading comprehension.

Good readers are more literate in terms of their reading proficiency, which is one of the traits that distinguishes them from bad readers. Fluency is a useful indicator of reading comprehension, not only a distinction between expert and less competent readers. Fluency is a reading hurdle that must conquer in order to become competent readers. Because they often read slowly and without paying attention to decoding—the capacity to swiftly recognize words without having to strive to sound them out—poor readers struggle with fluency. For many struggling readers, reading fluency may not come naturally to them. Compared to competent readers, they need more fluency training and repetition. Reading fluency is often overlooked in reading instruction programs, despite its significance and the need for specialized training. When making judgments regarding how to address the requirements of all children in their classroom, teachers seldom take into account whether they are aware of their tough kids or how they should educate them. English instructors struggle to help become competent readers who like what they do, focus on it, and actively analyse what they read (Bala, 2020).

The study of reading comprehension is a discipline that is always evolving in response to the human demand for reading. Similarly, without a suitable method of teaching fluency, the objective of reading cannot be comprehended. Fluency instruction may provide students a solid basis for handling a variety of topics at any reading level. Akubo (2021) asserts that individuals read for comprehension. If a reader can read the words but cannot comprehend or relate to what they are reading, they are not reading. Active and intentional, good readers are able to take in what they read, analyse it, make sense of it, and personalize it. As they read, proficient readers reflect.

High comprehension readers are able to draw conclusions about the book, including what is important, what is accurate, what led to an event, and who is humorous. The prosody component of reading fluency emphasizes the appropriate usage of idioms and phrases. By employing the appropriate loudness, tone, emphasis, phrasing, and other elements in their oral presentation, readers may demonstrate that they are actively making sense of what they are

reading. Reading fluency consists of several components. Three elements emphasize the significance of precise word decoding, rapid and automated word recognition in related material, and expressive and significant text interpretation. These elements of reading are interrelated; expressive reading is facilitated by accurate and automatic reading. If readers want to successfully understand text and read well, each of the three must be clearly taught and thoroughly watched (Readingrockets.com, 2016).

A method to teaching called Interactive Digital Instruction for Explicit Fluency makes use of digital tools and technology to provide possibilities for individualized, collaborative, and engaging practice. A potential teaching tool to improve student engagement and learning effectiveness is interactive digital teaching. will find the interactive digital learning process engaging since it is a strategic tool for introducing to the material (Londa, 2022). To put it another way, interactive digital education is multimedia that has a control device that the user may utilize to choose the next instructional step (Sutopo, 2023). One tool for creating dynamic and interactive presentations that include text, animation, graphics, video, audio, and images is interactive digital teaching. (Darmawan, 2021). Interactive digital instruction, according to Hasirul (2020), is a method of delivering instruction that employs computer control to show the audience recorded video information. In addition to hearing sounds and seeing films, viewers may actively participate. According to the researchers, using interactive digital education in schools may foster students' creativity, increase their enthusiasm to study, and help them build the digital skills they will need in the future (Troussas et al., 2021). However, it heavily depends on the curriculum's design and integration as well as the teaching strategies used by the instructors. A digital technology-based learning tool called Interactive Digital Instruction for Learning in Schools allows students and material to engage in both directions. It is a collection of instructional materials that can be accessed by electronic devices such as computers, tablets, and mobile phones. These materials include text, images, audio, video, and animation. The goal is to make education more effective, dynamic, and interesting for schoolchildren (Mayer & Moreno, 2020).

The following characteristics define interactive digital instruction: Students engage directly with lessons. Combining several media kinds on a same platform is called multimedia. Flexibility: adaptable to each student's requirements and ability. Direct feedback: comment on ' work right away. Accessibility: material may be accessed at any time and from any location using digital devices (Bates, 2022). Students' interest, engagement, and knowledge of the subject matter have all been shown to improve when interactive digital media are used in the classroom (Wang et al., 2021). A modern educational tool that uses digital technology to make learning engaging, dynamic, and successful is interactive digital teaching. Because it combines multimedia elements and allows for direct interaction with the information, this medium may improve the quality of education in schools.

A straightforward and organized way to improve language proficiency and reading comprehension is via interactive digital teaching. Instructors that use interactive digital teaching are open about what they teach. They provide chances for practice and feedback, and they serve as role models for on how to begin and complete tasks. The majority of English language instructors in Kontagora Local Government Area fall short in this area, thus interactive digital education in the explicit fluency of reading comprehension may be an excellent opportunity for them to help read more easily and intelligibly. In every reading material, reading comprehension is crucial because it enables to understand the book's meaning on a literal, inferential, and critical level. According to Mannu (2020), students are not proficient readers because they are not being explicitly taught how to apply such abilities. Fluency is more than simply having read for a minute or practice it with a partner. Fluency skills, however, need ongoing instruction. According to the statement, kids' reading comprehension may need to be supported by interactive digital education for explicit fluency. Additionally, the method may help students who struggle with understanding, such as those who attempt to memorize the book or take answers out of it without their involvement. Students that struggle with reading are unable to read and comprehend academic courses. For courses like English language, having strong reading abilities is crucial. Reading and comprehending difficult materials, grasping ideas, and critically analysing and reacting to societal and cultural concerns are all possible components of this topic. Without excellent reading abilities, students may not be able to comprehend the material, draw connections, and participate in class discussions. Early reading proficiency development is crucial for students' academic performance in subjects like English language proficiency.

Globally, new technologies are now widely used. Mobile devices, in particular, have been used both inside and outside of the classroom to aid in the learning process and have shown to be very beneficial, particularly for reading fluency. Teachers may benefit from digital tools, software, and even the internet. Students are increasingly using technology to learn to read both inside and outside of the classroom. Students may decide to do these tasks on their digital platforms rather than listening to the instructor or reading printed materials in class if they have the option to do so online or on their mobile devices (Xie et al., 2019). Interactive digital media has a tremendous influence on classroom instruction. In addition to encouraging schoolchildren to focus, interactive digital-based learning has the potential to improve student learning outcomes via learning goals. It has been shown that this digital training encourages to participate more actively in their education. According to a study by Mayer et al. (2020), interactive learning apps may increase students' interest in learning by 35% when compared to conventional teaching techniques. makes it easier to comprehend abstract ideas: Students' comprehension of abstract ideas is enhanced via interactive simulations and representations. According to Johnson & Smith (2021) research, students who used interactive digital media improved their comprehension of fundamental mathematics by 28%. Students may study at their own speed by using interactive digital media (self-paced learning). Digital learning platforms may increase students' capacity for self-learning by 40% over the course of a single academic year, according to research by Brown et al. (2022). Information retention is improved: Digital media that is interactive and multimodal improves knowledge retention. According to a meta-analysis by Garcia & Lopez (2023), who learn via interactive learning retain knowledge 25% better than those who study using conventional methods.

Problem Statement

When they read, students often fail to respond to the questions posed to them. Students are often unable to summarize or recount what they have read. Students fail to meet the requirements for reading comprehension in both internal and external exams because they struggle to recall what they have read, provide the right response to what is stated in the text, connect new and prior text, or substitute words in the text with their own. They respond to inquiries

by literally extracting responses from the text. Additionally, the 2020 West African Examination Council (WAEC) head examiner report (Olu) corroborated this finding. Their incapacity to read fluently may be the cause of their poor reading comprehension. This is where the understanding issue is, especially for the students at Kontagora in the state of Niger. Thus, the purpose of this research is to determine if including interactive digital training for explicit fluency in reading comprehension will improve students' comprehension.

Objectives of the Study

The specific objectives of the study were to:

1. determine the difference between the pre-test mean score performance of the students in the experimental group and the control group in reading comprehension.
2. determine the post-test mean score performance of the students taught reading comprehension using Interactive Digital Instruction for explicit fluency in the experimental group and the control group taught without interactive digital instruction for explicit fluency in reading comprehension.

Research Questions

The following questions were raised to guide the study:

- What is the difference in the pre-test mean score performance between the experimental group and the control group in reading comprehension?
- What is the post-test mean score performance of the students taught reading comprehension using interactive digital instruction in the experimental group and the control group taught without interactive digital instruction in reading comprehension?

Research Hypotheses

The following Null Hypotheses were formulated for the study:

H₀₁: There is no significant difference between the pre-test mean score performance of the experimental group and the mean score performance of the control group in reading comprehension.

H₀₂: There is no significant difference in the post-test mean score performance of the students taught reading comprehension using interactive digital instruction for explicit fluency in the experimental group and the control group taught without interactive digital instruction for explicit fluency in reading comprehension?

Methodology

For this study, the quasi-experimental research design with pre-test and post-test was employed. The population of the research was made up of all the public senior secondary schools in Kontagora Local Government Area, Niger State at the time of the research with a total number of 1,867 senior secondary two students. A sample of students (174) was taken using the simple random sampling technique. The sample consisted of the experimental group and the control group.

The instrument used in data collection was Reading Comprehension Performance Test (RCPT) comprising of 30 multiple choice items and 10 open-ended items.

The control group received reading comprehension instruction without interactive digital reading fluency instruction for explicit fluency instruction. For the experimental group intervention, the experimental group underwent a structured intervention to improve fluency and reading comprehension using interactive digital instruction: with guidance from the instructor, the instructor introduced the use of YouTube to:

- i. Explain fluency elements and reading comprehension strategies: students watched YouTube videos featuring a native speaker of English language explaining the elements of fluency including, intonation and stress, punctuation marks, vocabulary and how to apply them in reading comprehension, including strategies for identifying main ideas, making inferences and summarizing.
- ii. Modeled reading via YouTube videos: students watched YouTube videos demonstrating fluent reading passages, showcasing how fluency elements are used.
- iii. Guided practice: students then practiced reading using the modeled fluency elements, following the method demonstrated in the video.
- iv. Individual reading practice: A passage was introduced to the students to read individually, with the guidance and support of the teacher.

The Reading Comprehension Performance Test (RCPT) was administered as a post-test to assess students' progress after the intervention. To address the study topic, all of the data were analyzed using the mean, and the hypothesis was tested at the 0.05 level of significance using the t-test. In the hypothesis test, the null hypothesis was accepted if the t-calculated value was less than the t-tabulated value, and rejected if the t-calculated value was equal to or larger than the t-tabulated value. Additionally, it was determined that if the computed p-value is less than the specified p-value, the null hypothesis will be rejected; if it is greater than the set p-value, the null hypothesis would be accepted.

Results of the Study

Table 1: Mean analysis showing the difference in the pre-test mean score performance between the experimental and control groups in the pre-test results

Group	N	Mean	Std. Deviation	Mean Difference
Experimental	81	36.11	7.796	0.013
Control	93	36.10	6.744	

Table 1 shows that the experimental group's mean score of 36.11 and the control group's mean score of 36.10 differed by an average of 0.013. This suggested that the achievement levels of the two groups were comparable. To ascertain if the mean difference was significant, the data were subjected to an independent samples t-test at the 0.05 level of significance in hypothesis one.

Table 2: Mean analysis showing the difference in the post-test mean score performance between the experimental group taught fluency with interactive digital instruction and control group taught without interactive digital fluency in reading comprehension

Group	N	Mean	Std. Deviation	Mean Difference
Experimental	81	25.09	4.629	2.076
Control	93	23.01	3.332	

According to Table 2, the experimental group's mean score of 25.09 was greater than the control group's mean score of 23.01, with a 2.076 difference in favour of the experimental group. This showed that students in the experimental group did better than those in the control group. Using an independent samples t-test at the 0.05 level of significance, hypothesis two was investigated to see whether or not there was a difference between the two.

Table 3: t-test analysis showing the difference between the pre-test mean score performance of the experimental and control groups in reading comprehension.

Group	N	Mean	Std. deviation	Df	t-cal	t-tab	Sig (P-cal)	Decision
Experimental	81	36.11	7.796	172	0.013	1.654	0.990	Retained
Control	93	36.10	6.744					

Not Significant at $df = 172$; $P > 0.05$, $t_{\text{calculated}} < t_{\text{tabulated}}$

The t-test analysis of the reading comprehension pre-test mean score difference between the experimental and control groups is shown in Table 3. The estimated t value (0.013) was found to be less than the t tabulated (1.654) with 172 degrees of freedom at the 0.05 level of significance. Since the t-calculated value was less than the t-tabulated value, the null hypothesis was maintained. Additionally, the P calculated value of 0.990 was greater than the P specified value of 0.05. It showed that the pre-test reading comprehension score means for the experimental group and the control group did not vary significantly. As a result, the performances of the two groups were almost similar.

Table 4: t-test analysis showing the difference between the mean score performance of the experimental group taught using interactive digital instruction and control group taught without interactive digital instruction in reading comprehension

Group	N	Mean	Std. deviation	Df	t-cal	t-tab	Sig (P-cal)	Decision
Experimental	81	25.09	4.629	172	3.350	1.654	0.001	Rejected
Control	93	23.01	3.332					

Significant at degrees of freedom (df) = 172; $P < 0.05$, $t_{\text{calculated}} > t_{\text{tabulated}}$

As shown in table 4, the mean score performance of the experimental and control groups in answering reading comprehension questions was compared using the t-test. The t-calculated value of 3.350 is higher than the t-tabulated value of 1.654 with 172 degrees of freedom at the 0.05 level of significance. Because the calculated t value was significant and higher than the t tabulated value, the null hypothesis was rejected. Additionally, the calculated P value was below the required P value, which was less than 0.001. It indicated that there was a significant difference in the mean score performance on reading comprehension questions between the experimental and control groups. Consequently, when it came to completing reading comprehension tasks, the experiment group fared better than the control group.

Discussion

When students received explicit interactive digital education, their reading comprehension grades were higher than those of the control group, which did not get explicit fluency instruction.

This outcome is consistent with the results of Johnson & Smith (2021), Mayer et al. (2020), and Brown et al. (2022), who concur that incorporating technology into reading instruction may enhance students' reading fluency and alter how educators instruct and students learn. Additionally, they concentrated their research on deliberate fluency education. This result is consistent with the findings of Garcia & Lopez (2023), who discovered that ' reading comprehension improves when they are fluent.

Conclusion

Students in the experimental group scored much higher on the post-test than those in the control group, according to the study. The students' exposure to interactive digital instruction during explicit fluency, which enhanced their capacity to answer reading comprehension questions, may thus account for the experimental group's post-test results. The students' exposure to interactive digital instruction in explicit fluency, which enhanced their capacity to answer reading comprehension questions, may thus account for the experimental group's post-test outcomes.

Recommendations

1. To help students respond to reading comprehension questions, English language instructors should specifically teach reading fluency abilities in the classroom using an interactive and digital teaching approach.
2. In order to increase students' reading comprehension, English language instructors must get sufficient training to explicitly teach fluency. Additionally, school administrators should organise seminars for English language instructors and textbook writers to raise awareness of the significance of include interactive digital education to include explicit fluency into reading comprehension training elements in English language textbooks.

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