

# EFFECT OF VISUAL PHONICS ON READING COMPREHENSION OF STUDENTS WITH HEARING IMPAIRMENTS IN IBADAN METROPOLIS

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## ABSTRACT

Students with hearing impairment are unique learners with exceptional language challenges due to lack of language input from home. These learners unlike hearing students that perceive sounds through the ear that benefits from traditional reading comprehension lessons. Students with hearing impairment rely solely on body gestures and visual language to comprehend learning. Thus, there is dire need for a suitable strategy to teach reading comprehension to these categories of learners. This study investigated the effects of visual phonics strategy on the reading comprehension of students with hearing impairment in Ibadan metropolis. The target population consisted of 17 students with hearing impairment in the two special schools in Ibadan metropolis. Purposive sampling technique was used to select 11 participants who exhibited reading comprehension problem from the two selected special schools. The participants were divided into an experimental group (visual phonics) and a control group. The researcher made use self – developed instruments which consisted of Reading Comprehension Performance Test (RCPT) for pre-test and post-test and instructional packages to teach reading comprehension to the two groups. The reading comprehension performance test consisted of 16 multiple-choice items drawn from the content area of the study. The face and content validity of the instruments were ascertained and subjected to reliability test using test re-rest method of reliability given reliability coefficient of 0.72. Data collected were analyzed using descriptive statistics (frequency and percentage) for

demographic information and inferential statistics (analysis of covariance) at 0.05 level of significance to analyses the research hypotheses. The findings revealed that visual phonics strategy at (F (1,5)=4.235; P<0.05)significantly improved reading comprehension skills of students with hearing impairment. However, gender did not play a significant role in this improvement, as there was no significant interaction between visual phonics, and gender (F (1,5) = 0.254; P>0.05). The study recommended the use of visual phonics technique in teaching reading comprehension to students with hearing impairment.

## **INTRODUCTION**

In the realm of education, addressing the unique needs of students with hearing impairments remains a critical area of focus. Reading comprehension, a fundamental skill for academic success across all domains, poses particular challenges for these students due to their reliance on visual modes of communication and the potential impacts of hearing loss on language acquisition. Visual Phonics (VP), a multisensory approach combining visual cues with phonetic information, emerges as a promising intervention to enhance reading comprehension among students with hearing impairments.

Students with hearing impairments often face significant obstacles in developing reading skills compared to their hearing peers. The acquisition of phonological awareness, crucial for decoding and understanding written language, is particularly challenging due to the auditory nature of phonetic information. Traditional methods of teaching phonics, which rely heavily on auditory cues, may not adequately support these students in mastering reading comprehension (Kretschmer, 2020).

Reading comprehension is the ability of an individual to make meaning of the writer's mind; Samantha (2023) stated that reading comprehension is the skill to interpret and comprehend the message the author conveys in text, encompassing both explicit and implied meanings, and drawing conclusions using one's prior knowledge. Ekeh, et al (2023) saw reading comprehension beyond just understanding the words on a page; its more about correctly interpreting symbols, images, and textual elements to grasp deeper meanings beyond the literal text. This implies that reading comprehension is the ability to understand and interpret written text. It involves not only recognizing and comprehending the words on the page but also grasping the deeper meaning, context and often the author's intended message. Samathan (2023) stated that reading comprehension takes place when reader's visual processing, processing speed, logic and reasoning skills, reader's prior knowledge, language fluency, ability to make inferences, text comprehension and vocabulary knowledge work together to make reader get the authors mind. There are numerous strategies and methods used in teaching reading comprehension to students with hearing impairment in schools, among these strategies belong visual phonics.

Visual phonics is an educational approach designed to support students with hearing impairments who are facing challenges in developing essential skills such as recognizing printed words, understanding the alphabet and connecting sounds to letters. It is a structured programme to help students with hearing impairment grasps the phonetic elements of the English language, gives students with hearing impairment the opportunity to play with representations of sounds and internalize them in a visual way, helps to make connections between meanings and printed words, allows students with hearing impairment to develop reading comprehension abilities and raises students with hearing impairment phonemic awareness, makes students to be fluent in reading and decode the meaning of what is read (Wendland 2021).

Gender differences in learning outcomes and educational interventions are well-documented across various populations. In the context of students with hearing impairments, gender-specific factors such as communication preferences, cognitive strategies, and social influences may influence the

effectiveness of educational interventions like Visual Phonics (Smith et al 2019). This study will explore whether gender moderates the relationship between Visual Phonics instruction and reading comprehension outcomes, providing insights into how instructional approaches can be tailored to better meet the needs of male and female students with hearing impairments.

## STATEMENT OF THE PROBLEM

Poor performance of students with hearing impairment in reading comprehension might be a result of inadequate and inappropriate instructional strategies by the teachers. This has been a source of concern to all stakeholders in education, especially special education teachers. Despite the importance of reading comprehension in academic success, students with hearing impairment in Ibadan Metropolis continue to struggle with developing this skill, with many exhibiting poor reading comprehension abilities. The existing reading instruction approaches in use in Ibadan Metropolis may not be effectively addressing the needs of students with hearing impairment, leading to a persistent gap in reading achievement. Furthermore, the role of gender in influencing the effectiveness of reading instruction approaches for students with hearing impairment remains unexplored in the Ibadan Metropolis context. Therefore, this study aims to investigate the effect of visual phonics on reading comprehension among students with hearing impairment in Ibadan Metropolis, with gender as a moderating variable, in order to identify a more effective reading instruction approach for this population.

## **HYPOTHESES**

The following hypotheses were formulated and tested at the 0.05 level of significance:

**Ho1:** There is no significant main effect of visual phonics method on the reading comprehension of students with hearing impairment.

**Ho2:** There is no significant interaction effect of visual phonics and gender on reading comprehension of students with hearing impairment.

## METHODOLOGY

The research design adopted for this study was a pretest-posttest non-equivalent control group quasi-experimental design.

The researcher made use of purposive sampling technique to select participants across the two special schools in Ibadan metropolis. The participants were selected because they exhibited reading comprehension difficulties after the researcher asked the students to read a short passage and narrate such. The number of participants that exhibited such difficulties were selected from the two special schools total eleven11. Experimental group was taught reading comprehension using visual phonics strategy while control group was taught using traditional method.

The researcher developed Reading Comprehension Performance Test (RCPT) as research instrument which was used as pre-test and post-test. The instrument was made up of (16) multiple choice items drawn from the four-content area of the reading comprehension available in the school syllabus (main idea and supporting details, sequencing and organization, vocabulary development, drawing inferences and making predictions).

## **Treatment Packages**

The treatment package for the visual phonics strategy was meticulously designed by the researcher to guide the instructional process for Experimental Group. This strategy was implemented over a period of four weeks, with each lesson lasting 40 minutes. Each lesson comprised four segments: introduction, presentation (which included five procedural steps), evaluation, and lesson summary. The treatment package addressed four specific sub-content areas of reading comprehension.

Topics (aspect of reading comprehension to be examined)	Knowledge	Understanding	Application	Total
Main Idea and Supporting Details	2	1	1	4
Sequencing and Organization	2	1	2	5
Vocabulary Development	1	2	1	4
Drawing Inferences and Making Predictions	1	1	1	3
Total	6	5	5	16

#### Topics taught in reading comprehension are tabulated below:

The data collection lasted six weeks. The first week involved training the research assistants, administration of pretest and exposing students to the treatment. The Reading Comprehension Performance Test (RCPT) served as both pretest and post-test for both the experimental and control groups over the six weeks. The class teachers for the control group taught the same topics as scheduled for the treatment group using the conventional method.

The data were analyzed using descriptive statistics and Analysis of Covariance (ANCOVA) at a significance level of 0.05.

Table 1: Demographic Information of the Groups						
Groups	No of pupils	Gender	Frequency	Percentage (%)		
Experimental	6	Male	4	36.36		
		Female	2	18.18		
Control	5	Male	3	27.27		
		Female	2	18.18		
Total	11		11	100.00		

**RESULTS** 

Table 1 shows the demographic information of the group (visual phonics method). There were six (6) students in experimental group in which 4 were male (36.36%) and 2 were female

(18.18%), while the control group had five (5) students in which 3 were male (27.27%) and 2 were female (18.18%). There were seventeen (11) students altogether.

**Hypothesis one:** There is no significant main effect of visual phonics method on the reading comprehension of students with hearing impairment.

**Table2:** Summary of Analysis of Covariance (ANCOVA) of the main effect of visual phonics method on the reading comprehension of students with hearing impairment.

Source	Type III Sum Squares	of Df	Mean square	F	Sig	Partial Eta Squared
Corrected Model	33.216 <sup>a</sup>	4	8.304	1.731	.261	.536
Intercept	36.05	1	36.059	7.516	.034	.556
Pre-test	1.882	1	1.882	.392	.554	.061
Visual-phonics	20.316	1	20.316	4.235	.032	.414
Gender	.538	1	.538	.112	.749	.018
Visual phonics* gender	1.219	1	1.219	.254	.632	.041
Error	28.784	6	4.797			
Total	953.000	11				
Corrected Total	62.000	10				
- D C =	D C					

a. R Squared = .536 (Adjusted R Squared = .226)

Table 2 shows the effect of visual phonics method on the reading comprehension of students with hearing impairment. There was a significant main effect of treatments (visual phonics method) on academic performance of pupils with hearing impairment (F  $_{(1,5)}$ =4.235; P<0.05). Therefore, hypothesis that state that there is no significant main effect of visual phonics method on the reading comprehension of students with hearing impairment was rejected in the light of the result since the significant value is less than 0.05. This implies that there was a significant main effect in visual phonics method on the reading comprehension of students with hearing impairment was rejected in the light of the result since the significant value is less than 0.05. This implies that there was a significant main effect in visual phonics method on the reading comprehension of students with hearing impairment

Table 2 revealed the sources of the difference in students' academic performance in visual phonic

	stillated marginal means w	iui uie Groups	
VISUALPHONICS	Mean	Std. Error	
TREATMENT	10.361	.974	
CONTROL	7.297	1.056	

	Table 3: Summary	v of estimated marginal	means with the Groups
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Table 3 revealed that the significant main effect exposed by table 3 is as a result of the significant difference among:

3. Visual phonics

4. Conventional method

This implies that those exposed to Visual phonics (Mean = 10.361) performed significantly better than those exposed to conventional method (Mean = 7.297).

**Hypothesis two:** There is no significant interaction effect of visual phonics and gender on reading comprehension of students with hearing impairment.

Source	Sum Squares	of Df	Mean square	F	Sig	Partial Eta Squared
Corrected Model	33.216 <sup>a</sup>	4	8.304	1.731	.261	.536
Intercept	36.059	1	36.059	7.516	.034	.556
Pre-test	1.882	1	1.882	.392	.554	.061
Visual phonics	20.316	1	20.316	4.235	.032	.414
Gender	.538	1	.538	.112	.749	.018
Visual phonics gender	1.219	1	1.219	.254	.632	.041
Error	28.784	6	4.797			
Total	953.000	11				
Corrected Total	62.000	10				
$\mathbf{P}$ Squared = 526 (A diag	tod D Canor	d = 226				

**Table 4:** Summary of Analysis of Covariance (ANCOVA) of the main effect of visual phonics and gender on reading comprehension of students with hearing impairment.

R Squared = .536 (Adjusted R Squared = .226)

Table 4: reveals effect of visual phonics and gender on reading comprehension of students with hearing impairment. (F  $_{(1,5)} = 0.254$ ; P>0.05). The hypothesis was therefore not rejected in the light of the result since the significant value (0.632) is greater than 0.05. This implies that there was no significant effect of visual phonics and gender on reading comprehension of students with hearing impairment.

## Discussion

**Hypothesis one:** There is no significant main effect of visual phonics method on the reading comprehension of students with hearing impairment.

The findings of the hypothesis one revealed that visual phonics had a significant positive effect on reading comprehension in students with hearing impairment. The visual phonics method significantly enhances the reading comprehension of students with hearing impairments because the method integrates visual cues to teach phonics, which may be particularly beneficial for students with hearing impairments who rely more heavily on visual information. By associating visual signals with phonetic sounds, students can better understand and decode written language, improving their ability to comprehend texts. The finding is consistent with the findings of Narr (2020), who found that visual phonics instruction improved reading comprehension in deaf and hard of hearing students. The results revealed a significant main effect of visual phonics method on reading comprehension, indicating that visual phonics is an effective approach in improving reading skills for students with hearing impairment. In another study conducted by Trezek et al (2006) revealed that the use of visual phonics significantly improved the phonemic awareness and decoding skills of students with hearing impairments. Their study demonstrated that visual phonics, by providing a multisensory approach, helped bridge the gap between spoken and written language for these students.

**Hypothesis two:** There is no significant interaction effect of visual phonics and gender on reading comprehension of students with hearing impairment.

The findings of hypothesis two revealed that there was no significant interaction between visual phonics and gender. The results showed no significant interaction effect of visual phonics and gender on reading comprehension, indicating that gender does not play a significant role in the

effectiveness of visual phonics. The hypothesis was not rejected. The visual phonics method effectiveness is consistent across genders, meaning both male and female students with hearing impairments benefit equally from this instructional approach. The absence of a significant interaction effect suggests that gender does not influence how students respond to the visual phonics method. This uniform efficacy across genders indicates that the visual phonics method can be universally applied to all students with hearing impairments without the need for gender-specific adaptations, providing an inclusive approach to improving reading comprehension. The research finding is in line with the work conducted by Wang, et al (2008) which explored how visual phonics interacts with gender in relation to the reading success of students with hearing impairments. The findings revealed that there was no notable interaction between visual phonics and gender, indicating that the effectiveness of visual phonics as an instructional method was uniform for both male and female students.

### Conclusion

Based on the findings of the study, it can explicitly be stated that visual phonics strategy can enhance better reading comprehension of students with hearing impairment than the traditional method of teaching and learning irrespective of the learner's gender.

#### Recommendations

Based on the findings of this study, the following recommendations were made:

- 8. Curriculum planners and policymakers should integrate multisensory approaches, such as visual phonics, into the reading curriculum for students with hearing impairments, provide teacher training, develop inclusive materials, and allocate resources for effective implement
- 9. Teachers and educators should incorporate visual phonics technique into their reading instruction for students with hearing impairment so as to enhance their reading comprehension. Further research is needed to explore other innovative instructional methods and their impact on reading comprehension for students with hearing impairments. Longitudinal studies can provide deeper insights into the long-term benefits of the visual phonics method and the bottom-up approach. Regular assessments should be conducted to evaluate the effectiveness of these methods, and the data collected can be used to make informed decisions and adjustments to instructional strategies.

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