

Effect of Visual Auditory Kinesthetic Tactile Strategy on Reading Comprehension of Pupils with Dyslexia in Shendam, Plateau State, Nigeria

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Abstract

This study examined the effect of visual auditory kinesthetic tactile (VAKT) strategy on level of reading comprehension of pupils with dyslexia. The aim of the study was to determine the VAKT strategy on the organisational and critical level of reading comprehension of pupils with dyslexia. The study answered two research questions and tested four hypotheses. The theory of literacy processing propounded by Clay in 2005 is the theoretical framework for the study. The population of the study comprised 62 pupils with dyslexia from public primary schools in Shendam Local Government Area of Plateau State, Nigeria. Purposive sampling technique was used to select twenty (20) primary five (5) pupils as samples for the study. A non-equivalent pretest-posttest control group quasi-experimental research design was employed. An adopted word recognition test of high frequency words (WRTHFW) and a teacher-made words and sentences comprehension assessment (WASCA) instruments were used for data collection. Intervention lasted for ten (10) weeks. The generated data were analysed using pearson product moment correlation coefficient at 0.05 level of significance. The results showed that VAKT significantly improved the reading comprehension skills of pupils.

Keywords: *Auditorykinesthetic tactile, Critical reading level, Dyslexia, Organisational reading level, Reading comprehension*

Background to the Study

Reading is an interactive activity between the reader and the written text with the aim of arriving at the writer's intended meaning. Reading is a veritable means of decoding symbols towards arriving at a meaningful and appropriate understanding of the written text. Oftentimes, reading brings about reading comprehension. Reading Comprehension is the process of constructing meaning from a text. Reading Comprehension simply entails getting meaning from print. Zemelman, Daniel and Hyde (1998) observed that reading is not just phonics, vocabulary, syllabication or other "skills". That as useful as these activities may be, the essence of reading is a transaction between words of an author and the mind of the reader, during which meaning is constructed. It means that reading comprehension involves decoding the writer's words, then using background knowledge to construct an appropriate understanding of the writer's message. There are four levels of reading comprehension which are literal, inferential, organisational and critical levels of reading comprehension.

Reading comprehension is the final goal, whether a person reads for pleasure, to learn or to find a particular information (Shamla, 2010). As reading comprehension is the process of decoding and constructing meaning through interaction and involvement with the written text. However, most children find it difficult to benefit maximally from reading comprehension. To this end, Ozegya (2015) reported that school-aged children find reading comprehension difficult in our classrooms on a daily basis, because the organisational level of reading comprehension requires the reader to do more than understanding the stated facts. It requires the ability to see relationships within material and to determine what is important and significant and what is supporting detail (Lerner, 1985). Critical level of reading comprehension has to do with the ability to relate new ideas with previous knowledge which helps the reader to accept or reject the new idea. Through knowledge, the reader is able to make comparisons and judge the relevance. This is the level at which a child attempts to elevate their thinking level to a more critical, analysing level (Berry, 2005), and this poses a serious challenge for who finds it difficult to do. Thus, whoever finds difficult to gain maximally from reading comprehension is always referred to as individual with dyslexia (Osisanya, Lazarus and Adewunmi, 2013).

Dyslexia is best described as a reading difficulty which affects an individual's learning process in one or more areas of reading, spelling and writing. Dyslexia remains as the commonest reading disability in this contemporary age. It is widely recognised as a neurological disorder, and being characterised by problems in expression, reception, oral or written work which always emerge during classroom teaching and learning process. It is manifested in pupils as deficiency in one or more skills of the lower and higher levels of reading. Dyslexia can lead to frustration and discouragement, which in turn may lead to anxiety, anger, disturbed self-image, low self-esteem, low motivation and depression in a child. According to Ozoji, Unachukwu and Kolo (2016), pupils with dyslexia are those whose intelligence as measured by intelligence test may be average or above average but perform very poorly as well as experience significant difficulty below expectancy for both the child's reading potential and for chronological age. Oftentimes, pupils with dyslexia exhibit difficulty in decoding and understanding text, and thus several research efforts have

been made towards managing this condition among the identified pupils in some schools. Furthermore, it has been reported that pupils with dyslexia always exhibit in the area of expressive language, in addition to poor speech fluency, speech accuracy, and demonstration of appropriate nonverbal cues (Abiodun, Osisanya and Bamigboye 2012; Pangket, 2019). To the best knowledge of the authors, none of these previous researches utilised visual auditory kinesthetic tactile strategy.

Visual Auditory Kinesthetic Tactile (VAKT) strategy is a teaching strategy used for improving the reading comprehension levels of children with reading problems. Within the reading teaching context, VAKT is a technique for struggling readers involving visual, auditory, motor components and tactile embedded in a carefully planned lesson. The basis for the strategy is instruction through a multisensory approach through visual, auditory, and kinesthetic modals. Under visual auditory kinesthetic tactile strategy, teachers instruct the reading comprehension skills through multiple senses, where the instruction is highly intensive and explicit. The core content is taught through the use of sounds, syllables, words, sentences and written language (Magpari-Lavell, Paige, Williams, Skin and Cameron, 2012).

Similarly, Lerner (1985) also stressed that visual auditory kinesthetic tactile strategy entails that the learners see the word, hear the teacher say the word, say the word themselves, hear themselves as they say the word, feel the muscle movement as they trace the word, feel the tactile surface under their fingertips, see their hands move as they trace it and hear themselves say the word as they trace it. The author further observed that VAKT strategy is a multi-sensory approach which encompasses Fernald method and the Gillingham modalities concluded that the strategy can be used for teaching learners at all levels irrespective of their disabilities. Thus, readers whether beginners, average or advanced can gain some levels of improvement in their reading comprehension through the engagement of VAKT strategy.

Statement of the Problem

Nowadays, dyslexia is one of the challenging conditions among school-aged population across the globe. Children with dyslexia (dyslexics) have a great difficulty in decoding and understanding text, and that always lead to comprehension and retention difficulties. In line with the observations of Na-Ta'ala (2014) and Gwanshak and Gyang (2017), the number of students experiencing reading problems in school is increasing rapidly and it is estimated to have reached approximately 80.0%. This implies that there is a significant number of school-aged children that have problems with their academic pursuit since reading leads to positive learning outcomes in academic tasks. Most of the dyslexics in regular classrooms are neglected by their teachers as those that cannot cope in an educational setting, because they hardly read and comprehend what is read. It is therefore imperative to find out the scientific way by which individuals with dyslexia in school should be rehabilitated.

Purpose of the Study

The study is designed to determine the effects of visual auditory kinesthetic tactile strategy

on the reading comprehension skills of pupils with dyslexia. The specific objectives are to:

- i. determine the effects of Visual Auditory Kinesthetic Tactile strategy on the organisational level of comprehension of pupils with dyslexia; and
- ii. examine the effects of Visual Auditory Kinesthetic Tactile strategy on the critical reading comprehension of pupils with dyslexia.

Research Questions

The following questions were answered in the study:

1. To what extent will organisational level of reading comprehension of pupils with dyslexia improve after exposure to VAKT strategy?
2. To what extent will critical level of reading comprehension level of pupils with dyslexia improve after exposure to VAKT strategy?

Hypotheses

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

1. There is no significant difference between the pretest organisational level of reading comprehension performance mean scores of dyslexic pupils in the experimental and control groups.
2. There is no significant difference between the posttest organisational level of reading comprehension performance mean scores of dyslexic pupils in the experimental and control groups.
3. There is no significant difference between the pretest critical level of reading comprehension performance mean scores of pupils with dyslexia in the experimental and control groups.
4. There is no significant difference between the posttest critical level of reading comprehension performance mean scores of pupils with dyslexia in the experimental and control groups.

Research Design

The research design that was used in this study is the quasi-experimental design. Specifically, the pretest posttest design was used. This design is illustrated in the diagram below:

Group	Pretest	Intervention	Posttest
A	01.....	X	02
B	03.....		04

(Source: Awotunde, Ugodulunwa and Ozoji, 2002).

In the diagram, there are two groups of participants, A and B. Group A is the experimental group. It was exposed to pretest (01), received intervention using visual auditory kinesthetic

tactile strategy and then was exposed to posttest (02). Group B is the control group. It was exposed to pretest (03) received no intervention (X) using visual auditory kinesthetic tactile strategy and then was exposed to posttest (04).

The population of this study comprised 62 primary five (5) pupils who have been identified with reading problems from a public primary school in Shendam. From the population, the researchers selected a sample of 20 pupils using purposive sampling technique. Ten (10) pupils from primary 5A were assigned to the experimental group and ten (10) pupils from primary 5B to the control group. The researchers used two instruments for data collection in this study. They are Word Recognition Test of High Frequency Words (WRTHFW) and a teacher-made test named Words and Sentence Comprehension Assessment (WASCA). The Pearson product moment correlation coefficient was used to obtain the reliability index which was 0.74.

Before the intervention, all pupils were tested on the ability to recognise 100 High frequency words, pronounce lengthy words, read simple sentences and sort out similar and different words. Each pupil was flashed a card for five seconds. The words that each pupil could read were kept on the right hand side while those the pupil could not read were kept on the left hand side and records were taken. Again each participant was issued three (3) slips of papers which he/she was expected to read each in 2 minutes.

The pretest was given to both experimental and control groups. The participants were assessed on levels of organisational critical reading comprehension. Each correctly recognised word in the first instrument attracted one mark while 2 marks each was for correctly reading items in parts of second instrument. The pretest lasted for one (1) week. The experimental group (5 A) received an intervention using visual auditory kinesthetic tactile strategy. The control group (5 B) was taught reading using the conventional method.

After eight (8) weeks of intervention, both the experimental and control groups were subjected to a posttest to determine their ability in recognising the High Frequency Words, Sentences as well as answer other questions in the instruments. The posttest lasted for one (1) week. Arithmetic mean was used to answer all the research questions while the hypotheses were tested using t-test for independent samples at 0.05 level significance.

Research Question 1: To what extent will organisational level of reading comprehension of pupils with dyslexia improve after exposure to VAKT strategy?

Table 1: Summary Table for Organisational Level of Reading Comprehension of the Experimental and Control Groups before and after Intervention

Groups	Pretest mean (x) scores	Posttest mean (x) scores	Mean (x) difference
Experimental (x1)	4.8	13.8	9
Control (x2)	4.2	7.2	3

Table 1 shows the pretest and posttest scores obtained on organisational level of reading comprehension mean scores of the experimental and control groups. Before exposure to visual auditory kinesthetic tactile strategy, pupils in the experimental group had a mean score of 4.8 while pupils in the control group had a mean score of 4.2. After exposure to visual auditory kinesthetic tactile strategy, the pupils in the experimental group had a mean score of 13.8 while the pupils in the control group had a mean score of 7.2. The result indicated a mean difference of 9 for the experimental group and a mean difference of 3 for the control group. This showed that visual auditory kinesthetic tactile strategy when used for teaching can significantly improves the pupils' organisational level of reading comprehension.

Research Question 2: To what extent will critical level of reading comprehension level of pupils with dyslexia improve after exposure to VAKT strategy?

Table 2: Summary Table for Critical Level of Reading Comprehension of the Experimental And Control Groups before and after Intervention

Groups	Pretest mean (x) scores	Posttest mean (x) scores	Mean (x) difference
Experimental (x1)	6	14.2	8.2
Control (x2)	3.8	6.2	2.4

Table 2 shows the pretest and posttest results on critical level of reading comprehension of both the experimental and control groups. Before exposure to visual auditory kinesthetic tactile strategy the pupils in the experimental group had a mean score of 6 in the pretest while the control group had a mean score of 3.8. After exposure to visual auditory kinesthetic tactile strategy, the pupils in the experimental group had a mean score of 14.2, while the pupils in the control group had a mean score of 6.2.

The result indicated that the experimental and control groups had mean differences of 8.2 and 2.4 respectively. This implies that pupils who were taught using visual auditory kinesthetic tactile strategy performed significantly better than their peers taught without visual auditory kinesthetic tactile strategy. The result showed that critical level of reading comprehension can be enhanced through visual auditory kinesthetic tactile strategy.

Hypothesis One: There is no significant difference between the pretest organisational level of reading comprehension performance mean scores of dyslexic pupils in the experimental and control groups.

Table 3: Summary Table for t-test Analysis for Pretest Organizational Level of Reading Comprehension Mean Scores of Pupils with Dyslexia in the Experimental and Control Groups

Groups:	n	x	S ²	df	Calculated t	Critical t	($\alpha=.05$)
Experimental	(X1)	10	4.8	3.73	18	0.45	2.10
Control	(X2)	10	4.2	3.96			

Table 3 reveals the pretest organisational level of reading comprehension mean scores of the experimental and control groups before intervention. The analysis shows that the experimental group had a mean score of 4.8 and a variance of 3.73 while the control group had a mean score of 4.2 and a variance of 3.96. Since the critical value of t (2.101) is greater than the calculated value of t (0.45) the researchers accepted the null hypothesis and therefore concluded that there is no significant difference between the organisational reading comprehension mean scores of the experimental and control groups before intervention.

Hypothesis Two: There is no significant difference between the posttest organisational level of reading comprehension performance mean scores of dyslexic pupils in the experimental and control groups.

Table 4: Summary Table for t-test Analysis for Posttest of Organisational Level of Reading Comprehension Mean Scores of Pupils with Dyslexia in the Experimental and Control Groups

Groups:	n	x	S ²	df	Calculated t	Critical t	($\alpha=.05$)
Experimental	(X1)	10	13.8	4.84	18	7.10	2.101
Control	(X2)	10	7.2	3.73			

Table 4 shows the posttest of organisational level of reading comprehension mean scores of the experimental and control groups after intervention. The result indicates that the experimental group had a mean score of 13.8 and variance of 4.84 while the control group had a mean score of 7.2 and a variance of 3.73. The results revealed a significant difference between the organisational levels of reading comprehension mean scores of the experimental and control groups, as the calculated t-value (7.1) is greater than the critical-value (2.10). Thus, there is a significant difference between the organisational levels of reading comprehension mean scores of the two groups after intervention.

Hypothesis Three: There is no significant difference between the pretest critical level of reading comprehension performance mean scores of pupils with dyslexia in the experimental and control groups.

Table 5: Summary Table of t -test Analysis for the Pretest Critical Level of Reading Comprehension Mean Scores of Pupils with Dyslexia in the Experimental and Control Groups

Groups:	n	x	S²	df	Calculated t	Critical t	($\alpha=.05$)
Experimental	(X1)	10	6	10.67	18	2	2.101
Control	(X2)	10	3.8	1.28			

Table 5 reveals the pretest critical level of reading comprehension mean scores of the experimental and control groups before intervention. From the result obtained, the experimental group had a mean score of 6 and a variance of 10.67 while the control group had a mean score of 3.8 and a variance of 1.28. The calculated t and critical t values are 2 and 2.101 respectively. Thus, there was insignificant difference between the critical levels of reading comprehension mean scores of the two groups before intervention.

Hypothesis Four: There is no significant difference between the posttest critical level of reading comprehension performance mean scores of pupils with dyslexia in the experimental and control groups.

Table 6: Summary Table of t -test Analysis for Posttest Critical Level of Reading Comprehension Mean Scores of Pupils with Dyslexia in the Experimental and Control Groups

Groups:	n	x	S²	df	Calculated t	Critical t	($\alpha=.05$)
Experimental	(X1)	10	14.2	11.07	18	6.78	2.101
Control	(X2)	10	6.2	2.76			

Table 6 shows the posttest critical reading comprehension mean scores of the experimental and control groups after intervention. The result indicates that the experimental group had a mean score and variance of 14.2 and 11.07 respectively while the control group had a mean score of 6.2 and a variance of 2.76. The result has established a significant difference between the critical levels of reading comprehension mean scores of pupils with dyslexia in the two groups after intervention.

Discussion

This study investigated the effects of visual auditory kinesthetic tactile strategy on the level of reading comprehension of pupils with dyslexia in Shendam, Plateau State. Two research questions were raised and answered, while four hypotheses were formulated and tested in the study. Research question one investigated the extent to which VAKT strategy can

improve the organisational level of reading comprehension of pupils with dyslexia. The findings showed that pupils in the experimental group performed better than those in the control group. While, the research question two investigated the extent to which VAKT strategy can improve the critical level of reading comprehension of pupils with dyslexia. Also, the findings established that VAKT when used in teaching pupils could significantly improve the critical level of reading comprehension among pupils with dyslexia.

In testing the hypotheses, the data collected was analysed using t-test for independent samples at 0.05 level of significance. In testing hypothesis one, it was discovered that the difference between the pretest organisational level of reading comprehension mean scores of the pupils in the experimental and control groups was not significant. Hence, the null hypothesis was accepted. In testing hypothesis two, it was discovered that the difference between the posttest organisational level of reading comprehension mean scores of the pupils in the experimental and control groups was significant. Based on the result in table 5, the pupils in the experimental group performed better than the pupils in the control group. In testing hypothesis three, it was discovered that the difference between the pretest critical level of reading comprehension mean scores of the pupils in the experimental and control groups was not significant. Hence, the null hypothesis was accepted. Hypothesis four was to determine if any difference existed between the posttest critical level of reading comprehension mean scores of the pupils in the experimental and control groups. Table 6 showed that the null hypothesis was rejected based on the mean scores of the two groups. This implied that there is a significant effect of VAKT strategy on the critical level of reading comprehension of pupils in the experimental group after intervention.

Conclusion

The findings of this study show that visual auditory kinesthetic tactile strategy has an effect on the pupils' levels of reading comprehension as indicated by the performance of the experimental group which was significantly higher than that of the control group.

Recommendations

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

1. Pupils with dyslexia and any other kind of reading disabilities should be taught using visual auditory kinesthetic tactile strategy.
2. Teachers of English language should improvise reading materials that appeal to pupils' sense of seeing, hearing and touching for beginning readers to ease word reading comprehension as a whole.
3. Ministry of education and schools should provide teachers with enough reading materials that are VAKT oriented since the materials are capital intensive.
4. Federal and State ministries of education should organize workshops for teachers on using VAKT strategy for teaching reading comprehension.

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