Scholars Journal of Arts, Humanities and Social Sciences OPEN ACCESS
Abbreviated Key Title: Sch J Arts Humanit Soc Sci
ISSN 2347-9493 (Print) | ISSN 2347-5374 (Online)
Journal homepage: https://saspublishers.com/journal/sjahss/home

Effect of Multisensory Instructional Strategy on Phonological Awareness of Preschoolers in Uyo Local Government Area of Akwa Ibom, Nigeria

Olota Philip Olaoluwa (Ph.D)[1*], Inyon, Aniefiok Udo(Ph.D)[2]

[1]Department of Earlychildhood and Special Education University of Uyo, Akwa Ibom Nigeria
[2]Department of Earlychildhood and Special Education University of Uyo, Akwa Ibom Nigeria

***Corresponding author:** Olota Philip Olaoluwa
| **Received:** 17.05.2019 | **Accepted:** 25.05.2019 | **Published:** 30.05.2019
DOI: 10.36347/sjahss.2019.v07i05.009

Abstract **Original Research Article**

The study focused on multisensory instructional strategy on phonological awareness amongst preschoolers in Uyo local government area. Two research questions were answered and two hypotheses were formulated and tested. The study adopted a pre-test, post-test quasi-experimental research design. It was carried out in four private nursery schools in Uyo local government of Akwa Ibom state. The sample for this study was 33 nursery two pupils from randomly selected private schools. Phonological Awareness Achievement Test (PAAT) was used as instruments for data collection in this study. It was subjected to face and content validity by three experts. The reliability of the instrument was established using Pearson Product Correlation in which a coefficient of 0.709 was obtained. Mean and standard deviation, analysis of covariance were used in answering research questions and testing the research hypothesis. Based on the data collected and analyzed, the study found that multisensory instructional strategy is an effective tool for phonological awareness among preschoolers and it was recommended that the technique should be inculcated in the teachers training curriculum for pre service teachers and retraining of early years care givers and teachers on the appropriate use of multisensory representation of sounds as a strategy for phonological acquisition should be encouraged.

Keywords: Multisensory, Phonological Awareness, Uyo.

INTRODUCTION

Multi-sensory instruction refers to the way information is delivered to the student. The three primary modes of instruction are visual, auditory, and sensory-motor. Visual instruction includes activities like reading a text or looking at a picture. Auditory instruction might involve listening to a lecture or a book on tape. A third mode of instruction is sensory-motor. This is often referred to as a "hands-on" approach. A multisensory approach, "also known as VAKT (visual-auditory-kinesthetic tactile) implies that students learn best when information is presented in different modalities [1]". The belief is that students learn a new concept best when it is taught using the four modalities. Activities such as tracing, hearing, writing, and seeing incorporates the four modalities. Multisensory strategy is the processing of new information via more than one sensory channel, thus stimulating multiple areas in the brain. When people learn new information, such as a language, the brain must process it in a way that the information is optimally retained.

Multisensory approach in teaching is the simultaneous use of visual, auditory, and kinesthetic-tactile to enhance memory and learning. Links are consistently made between the visuals (what we see), auditory (what we hear), and kinesthetic- tactile (what we do or feel) which enable the learner to store the information directly to the brain in its real sense.

It is a coherent representation of objects combining different modalities to enable us to have meaningful perceptual experiences. Using a multisensory teaching technique means helping a child to learn through more than one sense [2].

Many forms of instruction use more than one mode. For example, watching a film involves both auditory and visual components. Writing is an example of an activity that involves fine motor and visual instruction. Speaking would be a fine motor and auditory experience. Acting out a scene from a play involves all three modes: visual, auditory, and sensory-motor activities. Most teaching techniques are done using either sight or hearing (visual or auditory). The child's sight is used in reading information, looking at text, pictures or reading information based from the

board. The hearing sense is used to listen to what the teacher says.

Perhaps the child's vision may be affected by difficulties with tracking or visual processing. Sometimes the child's auditory processing may be weak. The solution for these difficulties is to involve the use of more of the child's senses, especially the use of touch (tactile) and movement (kinetic). This will help the child's brain to develop tactile and kinetic memories to hang on to, as well as the auditory and visual one. Taking into consideration the facts of individual differences, learning difficulties, etc. multisensory approach is the only way to satisfy the different needs of a child.

Multisensory techniques are frequently used for children with learning differences. Students with learning difficulties typically have difficulties in one or more areas of reading, spelling, writing, math, listening comprehension and expressive language. Multisensory techniques enable students to use their personal areas of strength to help them learn. They can range from simple to complex, depending on the needs of the student and the task at hand.

Research indicates that the brain has evolved to operate optimally in multisensory environments, since the natural environment itself contains many simultaneous stimuli that we must perceive, process, and react to [3]. If a classroom exercise stimulates more than one of the learner's senses at any given time, multiple channels of the brain are working to process the same information, and the brain is devoting more cognitive resources to that information. Most of the common senses used in learning are sight and hearing, the inputs for which are processed through an auditory/verbal channel and a visual/pictorial channel [4]. In addition, the information is not simply processed separately through the different channels, but the brain creates some interactivity between the two modes, essentially storing the information cross-referenced between the channels [2].

Previous theories held that only one sensory channel could be used at a time for optimal learning, otherwise it would result in cognitive overload and the learner would not be able to process more information. Research shows, however, that there is minimal performance decline when audio and visual tasks are performed simultaneously [5]. Multisensory processing may also enhance brain plasticity [6].

We remember 20% of what we read, 30% of what we hear, 40% 0f what we see, 50% of what we say, 60% of what we do and 90% of what we see, hear, say and do. When information is presented, it goes into our short term, working memory. Like a computer, unless we deliberately save the data into long-term storage, it is lost very quickly. The method we use to save new information that is presented to us determines the likelihood we will be able retrieve it in the future. If you think of memory as a file card box, then the least effective system for organizing information would be to write everything down in the same color, on the same size and color cards and throw them all into a big box. The same is true for learning. Here, our chances of successfully retrieving information are influenced by the number of pathways we create to find it. The pathways are the modes of learning [5].

The purpose behind multi-sensory instruction is to apply this concept of learning to all subject areas. The more experiences a student has with a piece of information, be it a spelling word, a process in mathematics, a novel, or a concept in science; the stronger their ability will be to remember it over a longer period of time. It is not always possible to provide all four elements but it would be useful to audit teaching approaches and consider how many elements are present. Multisensory teaching is effective at any age. However, age-appropriate resources for secondary pupils and adult learners have been almost impossible to source In a similar study Obaid [7] conducted a study on the impact of using multi-sensory approach for teaching students with learning disabilities in Jordan. The purpose of this study is to investigate the effect of using the Multi-Sensory Approach for teaching students with learning disabilities on the sixth grade students' achievement in mathematics at Jordanian public schools. To achieve the purpose of the study, a pre/post-test was constructed to measure students' achievement in mathematics. The test consisted of twenty items on mathematics. The sample of the study comprised (117) sixth grade students in Ruqaya bent Al Rasoul School for girls and Fatima bent el Yaman school for girls in Irbid the first directorate of Education and was distributed into four sections, which were selected purposefully. The sample of the study was divided into four groups (two experimental and two control groups). The experimental group was taught using multi-sensory approach while the control group was taught using the current approach. The sample of the study was (62) students in the experimental group and (55) students in the control group. Those groups were distributed into four purposefully selected sections in Ruqaya bent Al Rasoul School for girls and Fatima bent el Yaman school for girls in Irbid the first directorate of Education. Descriptive statistical analyses were used (Means and Standard Deviation) for the pre and post-tests of students' mathematics test to experimental and control groups. The findings of the study indicated that there were statistically significant differences in the post- test between the control and the experimental groups in favor of the experimental group. The researcher proposed some recommendations to enhance the importance of parental involvement on students' achievement in English language such as conducting further studies on other populations and for a longer time. The reviewed study utilized secondary school

students and was done in units in mathematics. The present study also utilized primary school pupils and the design and type of research of the reviewed study was employed in the present work.

In the same vein, Rosenberg [8] conducted a study on the effects of multisensory, explicit, and systematic instructional practices on elementary school students with learning impairments in encoding and oral reading in Eastern Massachusetts. The study utilized a single-subject research design - an experimental design. In this study, a visual analysis method was employed to measure academic learning outcomes in reading and encoding. Using the Word Identification and Spelling Test (WIST) and Comprehensive Test of Phonological Processing (CTOPP-2), results demonstrated favorable outcomes with increased scores in encoding and oral reading skills. Scores were noted to be more significant in oral reading than spelling. The graphic data depicted in this research analysis also provides substantial documentation for the phonological deficit theory. Furthermore, replication of the instructional practices utilized in this study can potentially increase academic growth within spelling and reading skill development as well as allow students with learning impairments to acquire the foundational literacy skills required to access higher level content-based curricula across additional academic disciplines. Moreover, these findings confirm the significance of incorporating a multisensory, explicit, and systematic approach that involves high-leveraged strategies and skills needed for student achievement. The reviewed study utilized primary school pupils. The present study also utilized primary school pupils and the design and type of research of the reviewed study was employed in the present work.

Also in 2016 [10], Schlesinger carried out a research work on the impact of multisensory instruction on learning letter names and sounds, word reading and spelling in Phoenix metropolitan. The purpose of this study was to investigate whether the use of simultaneous multisensory structured language (multisensory) instruction promoted better letter name and sound production, word reading, and word spelling for second grade children with typical development (TD; N=6) or with dyslexia (DYS; N=5) than structured language instruction alone. The use of non-English graphemes (letters) to represent two pretend languages were used to control for children's lexical knowledge. A multiple baseline, multiple probe across subjects single-case design, paired with an alternating treatments design, was used to compare the efficacy of multisensory and structure language interventions. Participant's graphed data was visually analyzed and individual Tau-U and weighted Tau-U effect sizes were calculated for the outcome variables: letter name production, letter sound production, word reading, and word spelling.

Both interventions had an overall effect for participants with TD and DYS, though for individual participants intervention effects varied across outcome variables. However, the multisensory intervention did not provide a clear advantage over the structured intervention for participants with TD or DYS. The reviewed study utilized primary school pupils. The present study also utilized primary school pupils and the design and type of research of the reviewed study was employed in the present work.

In another study Moustafa and Ghani [9] conducted a study on the effectiveness of a multisensory approach in improving reading CVC words among mild intellectual disabled students in State of Kuwait. This research examined the effectiveness of multisensory approach for the purpose of reading CVC words among mild disabled students in the state of Kuwait. The discussion in this study is based on the multisensory approach that could be applied in the teaching of reading skills as well as phonemic awareness skills which could enable the students to acquire the early skills of reading. A total of 20 respondents were involved in the process of gathering data through the quantitative study method, which compromises of male and female mild intellectual disabled students. A pretest posttest method was applied in order to examine the effectiveness of the multisensory approach that could make it possible for them to read CVC words. T test for the paired sample was used to figure out the significant differences between the pretest and posttest scores achieved by the students. The findings of the study showed the effect of the multisensory approach in the teaching process of reading CVC words, which at the same time pave a way for the students to apply the mentioned skills in their learning process to read. This study is also significant for schools, centers, and institutes that are involved in the field of special education. Finally, it is considered as a road map to enable the students to learn and acquire the early skills of reading. The reviewed study utilized secondary school students. The present study also utilized primary school pupils and the design and type of research of the reviewed study was employed in the present work.

Research Questions

The following questions were formulated to guide the study:

- What is the difference in the phonological awareness mean score of preschoolers exposed to multisensory instructional strategy and those exposed to conventional methods of instruction?
- What is the influence of gender on the mean phonological awareness score of pupils?

Research Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

$H0_1$: There is no significant difference in the phonological awareness mean score of preschoolers exposed to multisensory instructional strategy and those exposed to conventional methods of instruction.

$H0_2$: There is no significant difference in the phonological awareness mean score of boys and girls exposed to multisensory instructional strategy.

Methodology

Quasi experimental pre-test-post-test control group design was adopted for the study. The study was conducted in four nursery schools in Akwa Ibom, Nigeria. The population for the study consists of all the pupils in nursery two (2) classes in all private schools in Uyo Local Government Area, which is estimated at 2294 pupils in one hundred and ten (110) private nursery and primary schools in Uyo Local Government Area. A sample size of 33 nursery two pupils from four intact classes were used in the study and assigned to treatment (19) and control group (14). The treatment group was taught phonetic using multisensory representation of sounds strategy while the control group was taught with conventional look and say method. The instrument for data collection was the Phonological Awareness Achievement Test (PAAT). The instrument was face and content validated by three experts. s such as; English expert, early childhood experts and a classroom teacher. Pearson Product Correlation was used to determine the internal consistency of PAAT and it was found to be 0.709. This moderately high coefficient value indicates that the instrument is reliable to be used for the study. Mean and standard deviation was used to answer the research questions and Analysis of co variance was used to test the hypothesis at 0.05 level of significance.

RESULTS

Research Question 1

What is the difference in the phonological awareness mean score of preschoolers exposed to multisensory instructional strategy and those exposed to conventional methods of instruction?

Table-1: **Mean and Standard Deviation of Pretest and Posttest phonological awareness mean score of preschoolers exposed to multisensory instructional strategy and those exposed to conventional methods of instruction**

		Pre test		Posttest		
Methods of instruction	**N**		**SD**		**SD**	**Mean gain**
MIS	19	2.42	1.61	6.74	1.66	4.32
CM	14	2.50	1.40	4.14	1.41	1.64

MIS= Multisensory Instructional Strategy, CM= Conventional method

Result on Table 1 shows that the group taught phonological awareness using Multisensory strategy had a pretest mean score of 2.42 with a standard deviation of 1.61 and a posttest mean of 6.74 with a standard deviation of 1.66. The difference between the pretest and posttest mean for the group taught phonological awareness using Multisensory strategy was 4.32. The group taught phonological awareness using Conventional method had a pretest mean of 2.50 with a standard deviation of 1.40 and a posttest mean of 4.14 with a standard deviation of 1.64. The difference between the pretest and posttest mean for Conventional method group was 1.64. However, for each of the groups, the posttest means were greater than the pretest means with the Multisensory representation of sounds group having the highest mean gain. This is an indication that Multisensory representation of sounds instructional strategy had a more positive effect on pupils' achievement in phonological awareness than the Conventional method.

Research Question 2

What is the influence of gender on the mean phonological awareness scores of pupils?

Table-2: **Mean and Standard Deviation of Pretest and Posttest boys and girls phonological awareness scores of students**

		Pre test		Posttest		
Gender	**N**		**SD**		**SD**	**Mean gain**
Boys	18	2.44	1.50	5.61	1. 94	3.17
Girls	15	2.47	1.55	5.67	2.16	3.20

Result in Table 2 showed that the boys taught phonological awareness had a pretest mean of 2.44 with a standard deviation of 1.50 and a posttest mean of 5.61 with a standard deviation of 1.94. The difference between the pretest and posttest means was 3.17. The girls had a pretest mean of 2.47 with a standard deviation of 5.67 and a posttest mean of 5.67 with a standard deviation of 2.16. The difference between the pretest and posttest mean for the girls group was 3.20. For both boys and girls taught phonological awareness, the posttest means were greater than the pretest mean with girls having a slightly higher mean gain than their boys' counterpart.

Hypotheses 1

Ho_1: There is no significant difference in the phonological awareness mean score of preschoolers exposed to multisensory strategy and those exposed to conventional methods of instruction.

Table-3: Analysis of covariance (ANCOVA) of students overall phonological awareness score by methods of instruction and Gender

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Dec
Corrected Model	69.838[a]	4	17.460	8.175	.000	
Intercept	159.766	1	159.766	74.809	.000	
Pretest	15.510	1	15.510	7.262	.012	
Group	54.239	1	54.239	25.397	.000	S
Gender	.011	1	.011	.005	.943	NS
Group * Gender	.364	1	.364	.171	.683	NS
Error	59.798	28	2.136			
Total	1178.000	33				
Corrected Total	129.636	32				

S = Significant, NS= Not Significant at 0.05 level

The result in Table 3 shows that an F-ratio of 25.397 with associated probability value of 0.000 was obtained with regards to difference in the phonological awareness mean scores of students taught with multisensory representation of sounds and those exposed to conventional methods of instruction. Since the associated probability (0.000) was less than 0.05 set as criterion for taking a decision, the null hypothesis 1 (H_{01}) was therefore rejected. Hence, there is a significant difference in the phonological awareness mean score of preschoolers exposed to multisensory representation of sounds and those exposed to conventional methods of instruction.

Hypothesis 2

H_{02}: There is no significant influence of gender on the mean phonological awareness scores of students.

The result in Table 3 showed that an F-ratio of 0.05 with associated probability value of 0.943 was obtained with regards to the difference in the mean phonological awareness scores of boys and girls. Since the associated probability (0.943) was greater than 0.05 set as criterion for taking a decision, the null hypothesis (H_{02}) was not rejected. That is to say, there is no significant difference in the mean phonological awareness scores of boys and girls.

Findings of the Study

The following findings emerged from the study based on the data collected and analyzed:

- Multisensory representation of sounds strategy is more effective in improving phonological awareness of preschoolers than the conventional strategy.
- The gender of preschoolers does not have any impact on their phonological awareness.

DISCUSSION OF FINDINGS

The purpose of this study was to determine the effect of multisensory instructional strategy on the phonological awareness of preschoolers. The findings that have emerged from the study are hereby discussed.

The data presented in Table 1 provided answer to research question one. It was revealed that multisensory strategy is effective in improving phonological awareness of preschoolers. Analysis of Co variance was used to test the first hypothesis at the calculated F-value (25.397), significance of F (.000) and confidence level of .05. The result showed that the difference between the multisensory teaching strategy and conventional method in phonological awareness was statistically significant. This means that the multisensory instructional strategy is more effective than conventional strategy in improving the phonological awareness of preschoolers.

The above findings are consistent with the findings of Obaid.2013, Rosenberg. 2015, and Schlesinger, 2016 [10]. Who in their separate studies found that multisensory instructional strategy had significant effect on preschooler's phonological awareness than other instructional formats? Therefore, the results of this study with regards to preschooler's phonological awareness are attributed to the treatment given to preschoolers using multisensory instructional strategy. This is because children learn by their senses and the strategy appeals to the various senses of touch, sight and hearing which help the children to attain wholesome learning.

The data provided in Table 2 answers to research question 2. It was revealed that the gender of preschoolers does not influence their phonological awareness when taught using multisensory instruction.

CONCLUSION

The results of this study showed that multisensory representation of sounds strategy enhanced acquisition of phonological awareness more than the talk and chalk method of teaching and gender seems not to have a potent influence on the phonological awareness of preschoolers exposed to Multisensory strategy. Thus, teachers should move away from the talk and chalk or telling method and select strategies that promote active learning in the classroom. It is important to involve the pupils while developing early literacy skills as pupils need to

participate actively in the learning process. There is need for us to "shift the emphasis from teaching to learning from our world to the children's world''. Above all, we should provide opportunities for the children to play, so that learning for them is an active and creative process. Generally, teachers should provide our pupils with an environment containing the best materials for learning. In such environment, teachers will observe and plan while the pupils will experience and discover. This is what makes literacy pupils-oriented and lively instead of being dull and abstract. Active learning strategies if employed in our literacy lessons would bring about positive attitude and higher acquisition of early literacy skills and ensure the realization of the objectives of literacy in our schools.

RECOMMENDATIONS

On the basis of the findings of this study, the researcher therefore makes the following recommendations:

- Early years teachers should adopt multisensory instructional strategy in classroom teaching and learning so as to help pupils in acquiring age appropriate phonology.
- The various childhood education programs in Colleges of education and Universities should incorporate multisensory instruction into their various teacher education programs so as to prepare teachers on how to teach phonemes.

REFERENCES

1. Birsh JR, Ghassemi C. Are multisensory instruction and science based reading research (SBRR) in tune. Presentation at the New York Branch of the International Dyslexia Association Conference in New York, NY.
2. Paivio A, Clark JM. Dual coding theory and education. InDraft chapter presented at the conference on Pathways to Literacy Achievement for High Poverty Children at The University of Michigan School of Education 2006 Sep 29.
3. Singer T. The neuronal basis and ontogeny of empathy and mind reading: review of literature and implications for future research. Neuroscience & Biobehavioral Reviews. 2006 Jan 1;30(6):855-63.
4. Mayer RE, Moreno R. Nine ways to reduce cognitive load in multimedia learning. Educational psychologist. 2003 Mar 1;38(1):43-52.
5. Clark RC, Nguyen F, Sweller J. Efficiency in learning: Evidence-based guidelines to manage cognitive load. John Wiley & Sons; 2011 Jan 11.
6. Shams L, Seitz AR. Benefits of multisensory learning. Trends in cognitive sciences. 2008 Nov 1;12(11):411-7.
7. Obaid MA. The impact of using multi-sensory approach for teaching students with learning disabilities. Journal of International Education Research. 2013;9(1):75.
8. Rosenberg L. The effects of multisensory, explicit, and systematic instructional practices on elementary school students with learning impairments in encoding and oral reading.
9. Moustafa A, Ghani MZ. The Effectiveness of a Multi-Sensory Approach in Improving Reading CVC Words among Mild Intellectual Disabled Students in State of Kuwait. Journal in Research & Method in Education. 2017;7(1):43-9.
10. Schlesinger NW, Gray S. The impact of multisensory instruction on learning letter names and sounds, word reading, and spelling. Annals of dyslexia. 2017 Oct 1;67(3):219-58.