

Effects of Pictograph Strategy on Pupils' Literacy Skills Performance in Lagos State Primary Schools Education

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Abstract

This study examined the Effects of Pictograph Strategy on Pupils' Literacy Skills Performance in Lagos State Primary Schools Education. It used quantitative research design and adopted a pre-test and a post-test control group 2x3x2 factorial design. It explored teaching strategy in pupils' literacy skill(at two levels) traversed with the socio-economic status (at three levels) and school location (at two levels). A pre-test and the post-test on Literacy Skills (Synonym words, writing words and relative nouns)were administered before and after the treatments lasting for five weeks. Test-retest method was used to determine the reliability of the instrument and the process returns reliability coefficients of 0.78 for the study. The target population for the study consists of all Basic Two Class pupils in the public primary schools of Lagos State. The study sample involved 8 public schools (with 236 pupils and 8 teachers). The analysis was done using descriptive statistics (mean) and Inferential statistics (ANCOVA) using the Statistical Package for the Social Sciences (SPSS) Version 20. The findings indicated means difference in the research questions 1, 2 and 3 and no significant differences in the treatment on pupils taught using pictograph strategy and conventional method. The treatment F-value of $[F(1,235)=.122;p>0.05]$ was not significant at 0.729and hypothesis one was not rejected. It is concluded that the pupils' school location and their socio-economic status have a greater influence on their literacy skills in pictograph and conventional classrooms. The study however, recommended that the use of pictograph strategy towards pupils' literacy skills should be known by all the primary school teachers as a mode of instruction.

Key Words:Pictograph, Literacy skills, Primary pupils

Date of Submission: 20-09-2022

Date of Acceptance: 05-10-2022

I. Introduction

The foundation of a child and his environment has great impacts in that child development. Since early childhood education and primary school education serve as foundations of an organised pedagogy, quality education at these levels will place a child at vantage position in literacy development. According to Rica, Lisa and John (2018), early childhood education is a critical period for language to develop and flourish in children. This growing language skill is a useful tool for satisfying needs and exchanging thoughts, hopes, and dreams with others. As abilities grows, the child understands and uses more of the resources of oral and recorded human knowledge, and as well on the way to becoming a literate being. A child's ability to communicate involves an integration of body parts and systems allowing hearing, understanding, organizing and using language.

Adeyele, Sowunmi, and Adeosun, (2018) stated that a pre-school child Centre or learning centre intent on developing language skills focuses on satisfying both physical and emotional needs while also providing intellectual opportunity and challenge by offering a variety of age-appropriate activities. The activities serve as strong foundation for pupils in the post-primary education. By this, language acquisition begins consciously at the pre-school centres where children are exposed to daily interactions through play to primary school level. The activities that stabilise the physical and emotional needs of children in pre-school age are mostly language based hence intellectual opportunities and challenges are equally provided simultaneously for pupils in primary schools. In the domain of language development, Rintaningrum, (2009), describe early literacy as an important aspect of the development of young children, because they need literacy skills to participate in their educational careers and social activities in the society. They view early literacy as the development of oral language

(speaking, listening). Growth in children is reflected in their gross motor skills, cognitive skills, social skills and language skills during the sensitive period of their lives.

Pictograph can have slightly different meanings depending on what lens it's being looked at through. In simple terms, a pictograph is a graphical representation of a word or phrase. The primary definition of a pictograph is an ancient painting or drawing done on rock or stone. So, the real pictographs are the drawings on the caves or stone because they were done to represent language. They were drawings that took the place of written words. It's also easy to see the Latin roots in the word pictograph as well. Picto comes from the Latin word 'pict' which means painting or drawing. Graph comes from the word 'graphs', which means writing. So, pictograph literally translates as picture writing.

The pictograph is a method to represent the data using images. Each image in the pictograph represents certain things. In other words, pictographs define the frequency of the data using images or symbols, which are relevant to the data. The pictograph is extremely easy to understand, and it is one of the simplest ways to represent the statistical data. In the pictograph, we use a key, which denotes the value of the symbol. While using symbols or images, all the symbols should be of the same size. The different steps to make a pictograph include: Collect the Data, Select the Symbol or Images. Assign a Key, Draw the Pictograph and Review the Data and Pictograph

Others uses it as a means of communication to render health services (Clawson, et al., 2012), and some use pictograph to help foreign settlers acclimatize to the native communication patterns of their host countries (Miller et. al, 2020; McNeill, 2020). It is broadly acknowledged that pictographs are simple ecumenical and identifiable by all people (Lodding, 1983; Wickens, 1992; Vaillant, 1997; Weidenbeck, 1999; Bordon, 2004). Pictographs sometimes may have powerful evocative potency which has significant figurative ability (Brangier&Gronier, 2000). This may be why pictogram are widely used in medicine to help all categories of legal drug users to comprehend medication information (Houts et al., 2006; Thompson et al., 2010; Barros et al., 2014). researches on dyslexia and illiteracy have also shown that pictograms, pictures, and graphics ease access to information (Grisedale, Graves &Grünsteidl, 1997; Huenerfauth, 2002; Rainger, 2003; Parikh, Ghosh & Chavan, 2003; Medhi, Sagar, & Toyama, 2005).

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Advantages of using Pictographs

Some of the important advantages of using Pictographs are as follows:

- Pictographs are used to express large information in a simple manner.
- It is easy to read, as all the information is provided at one glance.
- It does not require more explanation, as it is universally used.
- It attracts the attention of the viewers or readers, as it has many attractive images.

How to Make a Pictograph?

The different steps to make a pictograph are given below:

Step 1: Collect the Data

The first step in making a pictograph is the collection of relevant information, which we want to represent. Once the data is collected, make a table or a list of data.

Step 2: Select the Symbol or Images

To represent the data, pick any images/pictures or symbols. For example, if the data represents the rainfall for different cities, make use of cloud images or some other images which are relevant to the data.

Step 3: Assign a Key

While representing the data using images, use a key, which denotes the value of the image. Because, if the frequency of the data is too high, then one image is not enough to represent the data. Thus, the numerical value called "key" is used, which should be written along with the pictograph.

Step 4: Draw the Pictograph

While making a pictograph, use two columns that represent the category and data. Finally, draw the pictograph using symbols/images, which represents the frequency. In case, if the frequency is not a whole number, the symbols can be drawn as fractions.

Step 5: Review the Data and Pictograph

Once the pictograph is drawn, make sure that the images exactly represent data as well as the labeling of the pictograph. Objects may have clear pictorial similarities in pictograph and a learner who can interpret the meaning associated with the object can effectively use pictograph. Pictorial symbols, symbols however have been used differently in divers' parts of the world; there have also been attempts to use pictograph as a means of teaching alternate languages. (Marcus 2003; Takil, 2016.). Others uses it as a means of communication to render health services (Clawson, et al., 2012), and some use pictograph to help foreign settlers acclimatize to the native communication patterns of their host countries (Miller, et. al, 2020; McNeill, 2020).

Statement of the Problem

The communicative competence of the parents and the environment where a Child grows has great and unquantifiable influence on the language development of a child. The competence of the Caregiver and the school environment can be considered as contributing factors to the language development of children. In a formal setting, the use of language has been identified as a medium of expression especially when it has to do with interaction and feedback mechanism. Since the introduction of early childhood education in the teaching curriculum, backed with the notion that caregivers would give a more professional guidance, training and specialised education to pupils.

Surprisingly, studies conducted by Oshinaike and Adekunmisi, (2012); Wright (2016) have consistently shown that there exists a systemic decline in literacy skills and performance of pupils in both teacher made and standardised examinations. This can be connected to the inability of caregivers to effectively utilise teaching strategy that would drive motivation among learners, develop independent learning, effective interaction among peers and caregivers, relevance of objects and strategy among others. Therefore, this study addressed the Effects of Pictograph Strategy on Pupils' Literacy Skills Performance in Lagos State Primary Schools Education.

Purpose of Study

The main purpose of the study is to:

- examine the Effects of Pictograph Strategy on Pupils' Literacy Skills Performance in Lagos State Primary Schools Education.

Research Questions

The following research questions guided the study:

- i. What is the mean difference in literacy skills performance of pupils exposed to pictographstrategy and those in the conventional classroom?
- ii. What is the mean difference in the main effect of pupils' socio-economic status on their literacy skills performance?
- iii. What is the mean difference in the main effect of pupils' school location on their literacy skills performance?

Hypothesis

- i. There is no significant difference in the treatment on pupils' literacy skills performance exposed to pictograph strategy and those in the conventional classroom.

II. Methodology

The research design adopted for this study was quasi-experimental design. It provides the researchers with the focus on collecting and analysing quantitative data in a single study. The study examined the Effects of Pictograph Strategy on Pupils' Literacy Skills Performance in Lagos State Primary Schools Education. It used quantitative research design and adopted a pre-test and a post-test control group 2x3x2 factorial design. It explored teaching strategy in pupils' literacy skill(at two levels) traversed with the socio-economic status (at three levels) and school location (at two levels). A pre-test and the post-test on Literacy Skills (Synonym words, writing words and relative nouns)were administered before and after the treatments lasting for five weeks The population for the study consisted of all pupils in Lagos State primary 2 schools. The study samples involved 8 public schools (with 236 pupils and 8 teachers) in Badagry Local Government Education Area, Oto/Awori Local Government Education Area and AmuwoOdofin Local Government Education Area, Lagos selected using simple random technique. The instrument used was Achievement Test on Literacy Skills (ATLS). The ATLS sought for personal information of the respondent in terms of school location and socio-economic status with list of twenty objectives questions.The ATLS was face-validated by some experts in the field of research. The reliability of the instrument of this study was estimated at 0.78 using test-retest. The data collected was analysed

in the consideration of the research questions and hypothesis. In analyzing the data, both descriptive statistics (mean and standard deviation) and inferential statistics (ANCOVA). In testing the hypothesis formulated, the ANCOVA analysis was used and it was tested at 5% level of significance.

III. Results

The results of this study are presented according to the research questions in Tables I – II and the hypothesis.

Research Question 1

The question asked that what is the mean difference in literacy skills performance of pupils exposed to pictograph strategy and those in the conventional classroom?

Table I: Descriptive statistics of the pictograph strategy and control group classrooms in their literacy skills performance.

Treatments	N	Posttest Mean	Pretest Mean	Mean Difference
Experimental group 1	119	16.08	14.08	2.00
Control group	117	14.64	12.15	2.50
Total	236	15.37	13.12	2.25

The Table 1 shows that the participants in control group with mean difference of 2.50 is higher than the participants in experimental group 1 (pictograph strategy) with the mean difference of 2.00.

Research Question 2

The question asked that what is the mean difference in the main effect of pupils' socio-economic status on their literacy skills performance?

Table II: Descriptive statistics of socio-economic status on pupils' literacy skills performance

Socio-economic status	N	Posttest Mean	Pretest Mean	Mean Difference
Low	117	14.79	12.62	2.17
Middle	81	16.63	13.44	3.19
High	38	14.45	13.97	0.48
Total	236	15.37	13.12	2.25

The Table 2 shows that participants in middle socio-economic status had highest performance with mean difference of 3.19; the participants in low socio-economic status follow with mean difference of 2.17 and the participants in high socio-economic status had the least mean difference of 0.48.

Research Question 3

The question asked that what is the mean difference in the main effect of pupils' school location on their literacy skills performance?

Table III: Descriptive statistics of pupils' school location on their literacy skills performance

School location	N	Posttest Mean	Pretest Mean	Mean Difference
Urban	120	15.70	13.13	2.57
Rural	116	15.03	13.12	1.91
Total	236	15.37	13.12	2.25

The Table 3 shows that participants in urban area had the better performance with mean difference of 2.57 than the participants in rural area with the mean difference of 1.91.

Hypothesis

There is no significant difference in the treatment on pupils' literacy skills performance exposed to pictograph strategy and those in the conventional classroom.

Table IV: Showing the ANCOVA of pupils' literacy skills performance in experimental and control groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1625.046 ^a	12	135.420	8.338	.000
Intercept	1068.509	1	1068.509	65.788	.000
Pretest	1211.146	1	1211.146	74.570	.000

Treatment	1.977	1	1.977	.122	.727
Socio-economic status	165.891	2	82.945	5.107	.007
School location	19.878	1	19.878	1.224	.270
Treatment * Socio-economic status	3.872	2	1.936	.119	.888
Treatment * School location	2.936	1	2.936	.181	.671
Socio-economic status*	4.890	2	2.445	.151	.860
School location					
treatment * Socio-economic status * School location	74.917	2	37.459	2.306	.102
Error	3621.882	223	16.242		
Total	60989.000	236			
Corrected Total	5246.928	235			

a. R Squared = .310 (Adjusted R Squared = .273)

Table 4 is the summary of findings showing the ANCOVA Table with the mean square value of the pretest is 1211.146 and the posttest is 1068.509 that indicated a significant difference as the pretest mean square value is greater than the posttest mean square value of the pupils' literacy skills in the experimental and control groups. The Table 4 further shows that the treatment on pupils' literacy in the groups (Pictograph strategy and control) with F-value of $[F(1,235)=.122;p>0.05]$ was not significant at 0.729. This implies that there is no effects of the treatments on pupils' performance. Therefore, the hypothesis one that says there is no significant difference in the treatment on pupils' literacy skills performance exposed to pictograph strategy and those in the conventional classroom is thereby not rejected, that is, H_{01} is not rejected.

IV. Discussion of Findings

The inferential statistic as revealed in the ANCOVA Table indicated that there is no significant difference in the treatment on pupils' literacy skills performance exposed to pictograph strategy and conventional classrooms. This is contrary to the descriptive statistics and the inferential statistics of the pretest and posttest values of pupils' literacy skills performance. The pupils' literacy skills performance are significantly better in pictograph classroom than it is in the conventional classroom having significant values for both pretest and posttest values. It is inferred that there is a significant improvement of the pupils' literacy skills performance in the pictograph group over the conventional classroom in terms of the teaching strategies used in delivering the course contents. The pictograph strategy affords the pupils the opportunity to see the real object themselves without imagination in the classroom.

These results had been supported in the literature as many researchers had reported that pictographs as effective means of disseminating information for easy assimilations of pupils in classroom (Yamazaki & Taki, 2010; Tijus, et al., 2005; Barros et al., 2014; Houts, et al., 2006; Thompson, et al., 2010). The effective use of pictograph had generated great improvement on pupils' literacy skills within and outside the classroom. A considerable number of pupils had their understanding on literacy skills easily with further little supervision when they at their various home.

V. Conclusion

The study explored the effects of pictograph strategy on literacy skills of pupils in primary schools. From the findings of this study, it is noted that the pupils' literacy skills have a greater improvement via the use of pictograph strategy classroom over the conventional classroom. The pupils' school location and their socio-economic status have a greater influence on their literacy skills in pictograph and conventional classrooms. However, it can be concluded that the pupils' literacy skills performance of pictograph classroom is better than those of the conventional classroom as a result of the strategy used that arouse the pupils' interest towards learning to take place. It is, however, noteworthy that pictograph strategy is capable of bringing about the required positive change in pupils' literacy skills.

VI. Recommendations

The following recommendations are made based on the findings:

- i. Education districts, schools, teachers and future researchers could benefit from this study and continue building on this research.
- ii. Primary school educators should spring up wide publicity on the needs of pictograph and strategy towards pupils' literacy skills in classroom.
- iii. The use of pictograph strategy towards pupils' literacy skills should be known by all the primary school teachers as a mode of instruction.

- iv. There is need to often organise seminars or workshops in training the teachers on the contemporary concepts in teaching and learning in primary schools education.
- v. Professional associations like the Association of Nursery and Primary Education Instructors in Nigeria (ANPEIN) should popularise the pictograph strategy.

References

- [1]. Adeyele, V.O., Sowunmi, E.T., & Adeosun, O.A., (2018). Assessment of classroom management practices on social-emotional behavior of pupils. *International Journal of Education and Evaluation*. 4 (4)
- [2]. Barros, I.M.C., Alcantara, T.S., Mesquita, A.R., Santos, A.C.O., Paixao, F.P., & Lyra Jr., D.P. (2014). The use of pictographs in the health care: a literature review. *Res. Soc. Adm. Pharm.* 10 (5), 704-719
- [3]. Bordon, E. (2004). *Interprétation des pictographmes. Approche interactionnelle d'une sémiotique*. L'Harmattan
- [4]. Brangier, E., & Gronier, G. (2000). Conception d'un langage iconique pour grands handicapés moteurs saphasiques. *Handicap 2000, Nouvelles technologies: assistance technique aux handicaps moteurs et sensoriels*. Paris Porte de Versailles, 93-100, 15-16 juin, Paris : Ifrath.
- [5]. Clawson, T. H., Leafman, J., Nehrenz Sr, G. M., Kimmer, S. (2012). Using pictograms for communication. *Military medicine* 177(3), 291–295
- [6]. Grisedale, S., Graves, M., & Grünsteidl, A. (1997). Designing a graphical user interface for healthcare workers in rural India. *Proceedings SIGCHI conference on Human factors in computing systems*, 471-478, Atlanta, USA
- [7]. Houts, P. S., Doak, C. C., Doak, L. G & Loscalzo M. J (2006). The role of pictures in improving health communication: a review of research on attention, comprehension, recall, and adherence. *National Library of Medicine*; 8600 Rockville Pike, Bethesda, MD 20894
- [8]. Huenerfauth, M. (2002). *Developing design recommendations for computer interfaces accessible to non-literate users (Mémoire de master)*. University College Dublin, Dublin.
- [9]. Lodding, K. (1983). Iconic interfacing. In *IEEE Computer Graphics and Applications* 4 (12), 13-23.
- [10]. Marcus, P. (2003). *Rethinking Development Geographies*. New York, Routledge
- [11]. Medhi, I., Sagar, A., & Toyama, K. (2005). Text-Free User Interfaces for Illiterate and Semi-Literate Users. *Information Technologies and International Development*, 4(1), 37-50
- [12]. Miller, M.: A (2020). Pictogram Language Designed for the Displaced. <http://www.fastcompany.com/3063452/a-pictogram-language-designed-for-the-displaced..> Last accessed November, 2020
- [13]. McNeill, G. (2020). Refugee Communication Board Using Symbols. <http://www.callscotland.org/blog/refugee-communication-board-using-symbols>.
- [14]. Oshinaike, A.B. & Adekunmisi, S.R., (2012). Use of Multimedia for Teaching in Nigerian University System: A Case Study of University of Ibadan. *Library Philosophy and Practice (e-journal)*. 682. <https://digitalcommons.unl.edu/libphilprac/682>
- [15]. Parikh, T. Ghosh K. & Chavan, A. (2003). Design Considerations for a Financial Management System for Rural, Semi-literate Users. *ACM Conference on Computer Human Interaction*, Florida, USA
- [16]. Rainger, P. (2003). A Dyslexic Perspective on e-Content Accessibility. *JISC TechDis*.
- [17]. Rica, Lisa & John (2018). *A Review of The Literature: Early Childhood Care And Education (ECCE) Personnel In Low- And Middle-Income Countries*. Mom Luang Pin Malakul Centenary Building 920 Sukhumvit Road, Prakanong, Klongtoei, Bangkok 10110, Thailand
- [18]. Rintaningrum, R. (2009). Literacy: Its Importance and Changes in the Concept and Definition. *TEFLIN Journal*, 20, (1)
- [20]. Takil, N-B. (2016): Vocabulary Acquisition with Pictographs and Contextual Sentences in Teaching Turkish as a Foreign Language. *Turkish Studies International Periodical for the Languages, Literature and History of Turkish or Turkic* 11/3(1), 2133–2136
- [21]. Thompson, A.E., Goldszmidt, M.A., Schwartz, A.J., & Bashook, P.G. (2010). A randomized trial of pictorial versus prose-based medication information pamphlets. *Patient Educ. Couns.* 78 (3), pp. 389-393
- [22]. Tijus, C., Barcenilla, J., Cambon de Lavalette, B., Lambinet, L., & Lacaste, A. (2005). Conception, compréhension et usages de l'information iconique véhiculée par les pictogrammes. In D. Alamargot, P. Terrier, & J.M. Celler (Eds). *Production, compréhension et usages des écrits techniques au travail*. Paris: Octares
- [23]. Vaillant, P. (1997). *Interaction entre modalités sémiotiques : de l'icône à la langue*. Thèse de doctorat Université d'Orsay
- [24]. Weidenbeck, S. (1999). The use of icons and labels in an end user application program: An empirical study of learning and retention. In *Behavior and Information Technology*, 18(2), 68-82

- [25]. Wickens, C.D. (1992). *Engineering Psychology and Human Performance*. New York: HarperCollins.
- [26]. Wright, L. M. (2016). *How does play in dramatic play centers help preschool children develop oral language and literacy skills?* (Unpublished doctoral dissertation). Walden University.
- [27]. Yamazaki, A. K. &Taki, H. (2010). *An evaluation of pictograms for communication among Japanese- and Thai-speaking engineers working in manufacturing settings.*

J. A. Mafikuyomi, Y. A. Akinkuotu & B. G. Abidogun. "Effects of Pictograph Strategy on Pupils' Literacy Skills Performance in Lagos State Primary Schools Education." *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 27(10), 2022, pp. 50-56.