EFFECT OF GUIDED PLAY ON ACADEMIC ACHIEVEMENT OF PUPILS IN BASIC SCIENCE IN ENUGU STATE

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Abstract

This study examined the effect of guided play on the academic achievement of pupils in Basic science in Nsukka Local Education Authority. The study objective was to determine academic achievement of pupils taught using a guided play method and those exposed to conventional method in Nsukka Local Education Authority. One research question and one hypothesis guided the study. The study adopted a quasi-experimental research design. The participants in the study comprised 80 primary two pupils from four primary schools in Nsukka Local Education Authority. Two intact classes were used for the study. The data was analysed using mean and standard deviation and ANCOVA. The findings obtained from the research showed that pupils in the experimental group had better achievement than the pupils in the control group. The study concluded that the guided play approach is the most suitable way for children's teaching and learning. The researcher recommends that Educators should incorporate more play-based learning activities into their curriculum.

Keywords: Guided play, conventional teaching method, academic achievement,

Introduction

The first formal step in the learning process is educating a child in primary school. It serves as the foundation for the child's subsequent educational achievements (Levstik, & Barton, 2022). As defined by the Federal Republic of Nigeria (2014), primary education is education provided to children between the ages of 6 and 12. The entire school system depends on primary education (Sharp, Green & Lewis, 2017). As a result of the importance of this level of education, the Federal Government of Nigeria has made primary education compulsory, free, universal, and qualitative (Etor, Mbon, & Ekanem, 2013). The Nigerian Universal Basic Education Commission (UBEC) has made primary education free and inclusive for all children enrolled in regular schools in order to achieve this important objective. In other words, primary Education applies regardless of age, color, language, culture, learning ability, or disability. According to the National Policy on Education, primary education produces scientists for national development (Adebisi, 2014). In primary school, a good foundation in science cannot be overstated. Nigerian primary schools teach Basic Science as a core subject because it lays the foundation for science in secondary and tertiary schools.

Children develop scientific skills through basic science. The Federal Government of Nigeria has made it a priority to teach and learn the subject at the basic education level. Notably , Basic science is the elementary science that children are exposed to in order to enhance their interest and develop their scientific skills (Krajcik & Czerniak, 2018). In Bak's (2013) definition, basic science is the study of fundamental nature phenomena theoretically and experimentally. In this study, Basic Science refers to the science that helps children develop theoretical, experimental, and scientific skills.

The objective of science education in general and Basic Science in particular is to cultivate an inquiring, knowing, and rational mind for a good life and democracy; and to produce scientists for national development (Rudolph, 2020). Children should have a solid

foundation in science at primary school level in order to achieve this lofty national objective. Contrarily, Muhammad, Mohammed, Kanu, and Attaochu (2021) found that children have poor academic achievement in Basic Science at primary school level. As a result, national development will be adversely affected. In line with this view, Larimore (2020) noted that Basic science skills help children gain an understanding of their environment, develop desirable scientific attitudes, and apply them in the real world. A method for teaching basic science that allows for active participation of students in the classroom was advocated by Tabiin (2020). Unfortunately, Losco et al, (2017); Juuti, Lavonen, Uitto, Byman and Meisalo, (2017). The conventional method of teaching Basic science is still used, according to Athuman (2017), Skamp and Preston (2017), and Athuman (2010). As a result, primary school children may have a poor foundation in basic science (Stears, James & Beni, 2019). Ononye, Oguejiofor, & Ezenwagu, (2021), also found persistently low Basic science results in Enugu state primary schools. This poor performance could be attributed to ineffective teaching methods, according to Samuel (2017). For the children to learn, the teacher explains, demonstrates, and writes on the chalkboard. In a conventional classroom, children have a limited role to play. In the long run, this produces children who lack skills for modern technological challenges. The shortcomings of this method of teaching indicate the need for another method of teaching that can solve the problem.

Unlike the usual conventional method which makes learners passive participants in the learning process. Problem solving, discovery field trips, and Reggio Emilia approach to teaching, pupils develop creative, entrepreneurial, self-reliant, and scientific skills. As Mahyoob (2020) points out, learning basic science should be enjoyable and satisfying. Ossai and Ramsaroop (2022) opined that the Reggio Emilia approach can help to capture pupils' interest and sustain them for a long time in a classroom by providing such a satisfying and enjoyable experience. Onyekwelu, Uzoma, and Obidike (2019) assert that demonstrations and play-away methods promote basic science knowledge. Observing these discoveries, it can be concluded that any teaching method that involves children making discoveries, demonstrating and playing in Basic science tends to improve academic achievement. Play has been identified as a veritable tool for the optimization of children's classroom learning (Yu, Shafto, Bonawitz, Yang, Golinkoff, Corriveau & Xu, 2018).). Demonstrations and play should be used in classroom teaching and learning, according to ENSUBEB (2014) and NERDC (2012). Moreover, Basic science teaching should involve students' active participation, according to the authors. One such method is guided play.

Children's activities include play. Regardless of their age, children engage in this activity to improve their social and psychological skills (Lever,2020). In the classroom and at home, children learn through play. Therefore, children's play should be limited. Children learn through play (Vogt, Hauser, Stebler, Rechsteiner & Urech, 2020), (Saracho, 2020), (Cho,2021), (Collider, 2022). Play has become more important to teachers as a result of this. Through the exploration of the environment, play is also thought to instill in children the spirit of inquiry and creativity. Play is perceived as having many approaches. Different approaches to play are not only discussed in research, but also reflected in the beliefs and practices of primary school teachers. Child-directed play, guided play, and mutually directed play are described by Synodi (2010) as three main approaches to play in primary schools. Children can interact without teachers in child-initiated play (Pic, 2020). Both indoors and outdoors, the teacher does not get involved in the play. During this child-initiated play, the teacher is just an observer and a listener while the children are in charge of all the activities. Structured play is also known as guided play. The teacher organizes, initiates, and controls children's play (Parker, Thomsen & Berry, 2022). Guided play is used by the teacher as part of a learning activity. Mutually directed play involves the teacher participating in children's free play in a

nondisruptive way (Granone & Reikerås, 2021). Teachers can enrich children's play as co-players. The present study focuses on guided play. Both in the classroom and at home, guided play can be used to make children learn. Several studies have shown that play can be used to teach subjects such as mathematics (Vogt, Hauser, Stebler, Rechsteiner, & Urech, 2020), Deng, Wu, Chen, & Peng, 2020), and Pokhrel, 2023). According to Taylor & Boyer (2020), guided play provides a concrete method for teaching and learning. As well as promoting impactful learning, it contributes to the realization of education's broader goals. Using guided play in primary school in Nigeria might help in the acquisition of creative skills, practical skills, wealth creation, poverty alleviation, job opportunities, and generally national development if it is used in teaching and learning of basic science. The classroom is designed to encourage children to solve nation-wide problems through creativity. According to Bloom's education taxonomy, creativity is the last level of intelligence. A child should be able to relate to what he or she is learning. The teaching and learning of Basic science today lack relevant practices (Demir, 2021). Using conventional teaching methods and foreign theories makes it impossible for the learner to put their new knowledge into practice in their daily lives. It becomes a problem when one considers that poor academic achievement in basic science will undermine the nation's technological advancement. Therefore, it becomes imperative to assess the academic achievement of these primary school pupils in Basic science if these assertions are true.

In school, academic achievement refers to how well a student can accomplish a specific task (Zysberg & Schwabsky, 2021). Depending on the standard to which a pupil can achieve, academic achievement can be classified as poor or high. The subject of high academic achievement could be mathematics, civic education, Basic science and others. Any subject that fosters scientific innovation, such as Basic science, can have a significant impact on children. As a result, the nation can advance technologically. Academic achievement is defined by the researcher as pupils' success in Basic Science. A person's performance on a test is usually an indicator of this. Literature suggests, however, that the problem with basic science teaching lies in its methodology. It has been reported that the current method of teaching basic science is not yielding the desired results, and that providing children with a good foundation in science will benefit them throughout their academic career. Early curtailment becomes necessary. Various teaching approaches have been used to determine the most effective ways to teach school subjects, especially Basic science.

Among them are Reggio Emilia (Ossai & Ramsaroop,2022), mind mapping (Onah, Anamezie & Nnadi,2022), multiple teaching methods (Nwachukwu, Onah, Obijiofor, Nwankwo, & Nwakile, 2020), and guided enquiry (Odukwe & Nwafor,2022). Despite these studies, poor achievement persisted in Basic science. Accordingly, the researcher intends to examine whether guided play can improve academic achievement among primary two pupils in Enugu state.

Purpose Of the Study

The main purpose of the study was to find out the effect of guided play on academic achievement among primary two pupils in basic science in Nsukka local education authority of Enugu State Nigeria. Specifically, this study determined

1. The mean achievement scores of primary two pupils taught basic science with guided play and those taught with conventional method of teaching respectively.

Research Question

The following research question guided the study

1. What are the mean achievement scores of primary two pupils taught basic science with guided play and those taught with conventional method?

Hypothesis

The hypothesis was tested under 0.05 level of significance.

1. There is no significant difference in the mean achievement scores of primary two pupils taught Basic science with guided play and those taught with conventional method of teaching.

Method

The study adopted quasi-experimental design to determine the effect of guided play on academic achievement of primary two pupils in Basic science. The study was carried out in Nsukka local government area of Enugu State. The population of the study comprised 2,526 primary two pupils in Nsukka Local Education Authority of Enugu state. A sample of 80 primary two pupils was drawn using multi stage sampling procedure. The instrument used for data collection was a researcher developed test item titled "Basic Science Achievement Test" (BSAT). The instrument (BSAT) had 20 items. To ensure a comprehensive coverage of the content of the scheme, a test blue print was developed based on the objectives of Basic Science Curriculum for primary two pupils. The 20 test items are broken down as follows soil=4questions, water=4 questions, animal as a living thing= 3questions, plants as a living thing=4 questions, air in motion =3questions, measurement of time=2 questions. The instrument used for data collection was validated by three experts, one in Childhood Education Unit, Department of Educational Foundations, one from Measurement and Evaluation department of science Education all in the Faculty of Education University of Nigeria Nsukka and one classroom teacher from one of the public primary schools in Nsukka. The experiment was conducted in three phases, namely; pre-treatment, treatment and post-treatment. At the pre-treatment phase, the researcher discussed with the head teachers of the schools as well as the class teachers of the respective classes used for the study in terms of the purpose, objectives of the study, actual teaching time, content to be covered, class schedules, possible adjustments and the benefit that could be derived if properly conducted. Two teachers who served as research assistants from the schools used for the experiment schools were briefed to equip them with the necessary competent skills and information on the use of Reggio Emilia teaching strategy. Prior to the experiment BSAT was administered to the pupils in both the experimental group and the control groups. This was done to help to ascertain the extent the children possess relevant knowledge in Basic Science and also to determine their performance before the commencement of the experiment. The scores obtained was the pre-test.

The treatment phase lasted for six weeks using the normal period in the school with two periods in a week. One period lasted for 35 minutes. Two lesson plans that were developed by the researcher were used for the study, one each for the experimental and control groups. The lesson plans were prepared in conformity with Basic Science curriculum for the term using *Active basic science* textbook for the six weeks of teaching to ensure uniformity by both groups: the conventional lesson plan and the Guided play instructional package. This was done in the following order: Soil, Water and uses of water, Animal as a living thing, Plant as a living thing, Air in motion, Measurement of time. The actual teaching was carried out by the class teachers who are the research assistants. The researcher was not directly involved in the instruction.

At the post-treatment phase, the end line assessment of pupils' Basic Science achievement test which is the post test was administered to pupils in both experimental and control group. The researcher monitored the exercise to make sure the test is administered to pupils under same condition. It was administered for six weeks including a two-day briefing to the teachers. Each correct answer was scored 5 marks while wrong answer represented zero. Questions not attempted at all were also scored zero point. The minimum score was zero while the maximum score was 100. Kuder-Richardson (K-R21) was used to measure the internal consistency of the instrument after it was trial-tested and a reliability coefficient of 0.80 was obtained. Mean and standard deviation were used to answer the research questions while analysis of covariance (ANCOVA) was used to test the formulated hypotheses at 0.05 level of significance.

Result

Research Question One: What is the mean academic achievement score of pupils taught basic science with conventional approach and those taught with guided play in Nsukka LGA?

Table 1: Mean academic achievement scores and standard deviation of pupils taught basic science with conventional approach and those taught with guided play

Variable		Pretest		Posttest		
Instructional Model	**N**	$\bar{x}$	**SD**	$\bar{x}$	**SD**	**Mean Gain**
Guided Play	39	39.64	6.53	80.77	9.14	41.13
Conventional	43	39.86	6.87	53.21	9.88	13.35

$\bar{x}$: Means **SD**: Standard Deviation **N**: number of Students

The result in **Table 1** showed that both groups (i.e. guided play and conventional instructional approaches) had pretest mean academic achievement and standard deviation scores of (39.64 and 39.86) and (6.53 and 6.87) respectively, which revealed that they have a very close baseline of prior knowledge. However, after instruction, the group under the guided play instructional approach had a mean academic achievement score and standard deviation value of 80.77 and 9.14, while, the group under the conventional instructional approach had a mean academic achievement and standard deviation value of 53.21 and 9.88. Pupil taught basic science under guided play instructional approach had higher mean gain compared to their counterpart under the conventional instructional approach (41.13 > 13.35). This is an indication that the guided play instructional approach promotes pupils' academic achievement in Basic science.

Ho: There is no statistically significant difference in the mean academic achievement score of pupils taught basic science using conventional approach and those taught with guided play in Nsukka LGA

Table 2: Analysis of Covariance (ANCOVA) of the mean academic achievement score of pupils taught Basic science using conventional approach and those taught with guided play in Nsukka LGA

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	15651.378[a]	2	7825.689	86.413	.000
Intercept	7932.456	1	7932.456	87.592	.000
Pretest	117.662	1	117.662	1.299	.258
Instructional Tech.	15574.198	1	15574.198	171.973	.000

Error	7154.378	79	90.562
Total	383438.000	82	
Corrected Total	22805.756	81	

a. R Squared = .686 (Adjusted R Squared = .678)

In order to test hypothesis, analysis of covariance was used. The result in **Table 2** further confirmed the mean academic achievement score of pupils taught basic science using conventional instructional approach and those taught with guided play in Nsukka LGA to be statistically significant, F (1, 82) = 171.97; p = 0.00. This probability value of 0.00 was compared with 0.05 set as level of significance for testing the hypothesis and it was found to be significant because 0.00 is less than 0.05. The null hypothesis which stated that; there is no statistically significant difference in the mean academic achievement score of pupils taught basic science using conventional approach and those taught with guided play in Nsukka LGA was not accepted and inference drawn was that guided play instructional approach statistically significantly favours pupils' academic achievement in Basic science better than conventional instructional approach.

Discussion

The result in the table above shows that primary two pupils who were taught with guided play had an improved academic achievement in Basic science more than those taught with conventional approach in posttest. This is in line with the finding of (Ossai & Ramsaroop,2022), (Onah, Anamezie & Nnadi,2022), (Nwachukwu, Onah, Obijiofor, Nwankwo, & Nwakile, 2020), (Odukwe & Nwafor,2022). These researchers believe that any teaching method that involves the active participation of pupils like guided play tends to improve the academic achievement of pupils in Basic science. Supporting this claim, the FRN opined that the methodology of teaching should be one that de-emphasizes rote learning.

Also, Krajcik & Czerniak (2018) explain that teaching of Basic science should include and create experiences to help the child understand concepts in the classroom. This is also what guided play supports in the teaching and learning of basic science. This is because these experiences in the classroom help to concretize learning and also makes learning enjoyable in the classroom.

Conclusion

Guided play method of teaching is a very effective method of teaching and learning Basic science concepts among primary two pupils.

Recommendations

Appropriate measures should be undertaken such as incorporating experiential learning like a guided play teaching approach in the science curriculum for a more effective teaching and learning of basic science. Also, the school management should incorporate active participation of the pupils by creating roles during the teaching and learning of basic science in the classroom. Government should also improve the school's learning resources and learning environment.

Educational Implications

The result of this study showed that guided play improved the academic achievement of primary two pupils in basic science. The implication of this is that for pupils to learn science

effectively in the classroom, there has to be a blend of practical approaches like guided play in the teaching and learning of basic sciences especially at the formative years of their lives.

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