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EFFECTIVENESS OF PROBLEM-BASED LEARNING STRATEGIES ON ENHANCING CREATIVITY SKILLS AMONG PRIMARY SCHOOL PUPILS IN IKORODU LOCAL GOVERNMENT AREA OF LAGOS STATE

BY

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Abstract

*This paper investigated the effectiveness of problem-based learning strategies on enhancing creativity skills among primary school pupils in Ikorodu Local Government Area of Lagos Stat*e. *Three research questions and two research hypotheses guided this study. The study employed quasi-experimental and survey research designs*. *The population of the study was* two hundred and two (202) *primary five pupils and five (5) primary five teachers in the two selected primary schools. The sample size for the study was ninety-four (94) participants; comprising of forty (40) male and forty-eight (49) females primary five pupils and five (5) primary five teachers. Data were collected through questionnaire and pupils' achievement test on creativity skills (PATCS). The data collected were analysed using mean, standard deviation and Analysis of Variance (ANOVA) at 0.05 level of significance. The findings revealed amongst that problem-based learning (PBL) strategy has significant effect on primary school pupils' innovative thinking; and PBL has significant effect on pupils' acquisition of creativity skills at primary school level*. *The study concluded that PBL strategies are effective for enhancing creativity skills among primary school pupils*. *The study recommended among others that curriculum planners should embed problem-based tasks into primary school curriculum content; and teachers should incorporate PBL into daily classroom instruction*.

Keywords: Creativity Skills, Innovative Thinking, Primary School, Problem-Based Learning Strategies

Introduction

Primary school is universally recognised as the foundation of all formal education. It has a life span of six years; which is divided into lower primary (Primary 1-3) and upper primary (Primary 4-6). Primary school is an extension of the early childhood education, which aimed at enhancing the holistic development of children. It aimed at providing each child with the opportunities for developing manipulative skills which will enable the child to function effectively within the limits of the child's capacity in the society. Primary school has a competency-based curriculum that focuses on basic competencies like as literacy and numeracy as well as generic competencies such as creativity and critical thinking. Creativity is the ability to produce ideas or solutions that are novel and appropriate (Runco & Jaeger, 2012). The four creativity dimensions identified in the literature are fluency, flexibility, originality and elaboration. The fluency deals with generation of many ideas; while flexibility involves shifting of perspectives on generated ideas. The originality is the act of proposing unique ideas; while the elaboration involves refining and improving generated ideas. This shows the importance of creativity skills acquisition among the primary school pupils.

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The need to develop creativity skills in learners has become a pressing priority in modern education, particularly at the primary school level where foundational cognitive and affective abilities are formed. Creativity is recognised as an essential competency for effective participation in the 21st-century knowledge economy, enabling learners to generate new ideas, solve problems, and adapt to complex situations (Runco & Jaeger, 2012). According to Beghetto and Kaufman (2014), creativity at the basic education level strengthens cognitive flexibility, curiosity, problem-solving capacity, and innovation. All these attributes are vital for lifelong learning and societal development. Development of creativity skills among primary school pupils can be fostered using appropriate teaching approaches or strategies. One of these strategies is the use of problem-based learning (PBL). Hmelo-Silver (2004) described PBL as a structured learning approach that stimulates learners to ask questions, make investigations, identify relevant information, generate solutions, and reflect on outcomes. Also, Achor, Amadu and Orokpo (2019) considered PBL as a learner-centered pedagogy where students learn through solving real-life problems that require inquiry, collaboration, logical reasoning, deep thinking, and reflection. This is an indication that PBL is an innovative instructional strategy which may be highly effective for promoting creativity among primary schools' pupils.

International and local studies affirmed that PBL significantly enhances creativity among learners. For example, Savery (2015) reported that PBL enhances creativity by engaging learners in inquiry-based, open-ended tasks. Alos, Kim and Park (2019) found that PBL improved collaborative creativity and critical thinking among primary school pupils in South Korea. In Nigeria, Nwafor and Okeke (2020) reported that pupils taught with PBL showed greater originality and divergent thinking compared to those taught with traditional methods. These findings underscore the relevance of PBL as a teaching strategy capable of addressing Nigeria's creativity gap in primary education, especially in Lagos State. In Nigeria, the primary education curriculum emphasizes the acquisition of skills for creativity, critical thinking, and problem-solving. However, classroom practices in many primary schools remain largely teacher-centered, with lessons dominated by rote memorization, repetition, and direct instruction (Olagunju & Abiona, 2018). Such instructional methods limit pupils' opportunities to explore new ideas, engage actively in learning tasks, and develop deeper cognitive skills. Also, despite the potential of PBL in enhancing the development of creativity skills among primary school pupils remains underutilised in Nigerian primary schools. Supporting this claim, Olatoye and Aremu (2021) reported that PBL remains underutilised in Nigerian basic schools due to factors such as inadequate teachers' training, lack of instructional materials, and resistance to adopting learner-centered pedagogies. It is against this background that this study investigated the effectiveness of problem-based learning strategies on enhancing creativity skills among primary school pupils in Ikorodu Local Government Area of Lagos State.

Statement of the Problem

Creativity is a core competency required for learners to thrive in modern society. However, the instructional practices commonly used in Nigerian primary schools fail to provide adequate opportunities for pupils to develop this essential skill. Many teachers continue to rely on teacher-centered, exam-oriented methods that emphasise memorization over innovation and inquiry. As a result, pupils demonstrate low levels of divergent thinking, originality, and problem-solving abilities. Although problem-based learning (PBL) has been identified globally as an effective strategy for fostering creativity, its adoption in Nigerian primary schools is limited. Teachers often lack the training, confidence, or resources needed to implement PBL effectively. Consequently, there is inadequate empirical evidence on how PBL influences creativity among Nigerian primary school pupils, especially in Lagos State. This knowledge gap makes it difficult for policymakers, curriculum developers, and teachers to adopt strategies that genuinely enhance creativity. Therefore, the problem of this study is the insufficient empirical evidence on the effectiveness of PBL strategies in enhancing creativity skills among primary school pupils in Lagos State, particularly in Ikorodu Local Government Area of Lagos State.

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Consequently, this study investigated the effectiveness of problem-based learning strategies on enhancing creativity skills among primary school pupils in Ikorodu Local Government Area of Lagos State.

Research Objectives

The main objective of this study was to explore the effectiveness of problem-based learning strategies on enhancing creativity skills among primary school pupils in Ikorodu Local Government Area of Lagos State. The specific objectives of this paper are to:

i. ascertain the level of teachers' knowledge of problem-based learning strategies at primary school level;
ii. assess the effect of problem-based learning strategy on primary school pupils' innovative thinking; and
iii. examine the effect of Problem-Based Learning on pupil's acquisition of creativity skills at primary school level.

Research Questions

The following questions guided this study:

1. What is the level of teachers' knowledge of problem-based learning strategies at primary school level?
2. What is the effect of problem-based learning strategy on primary school pupils' innovative thinking?
3. What is the effect of problem-based learning on pupil's acquisition of creativity skills at primary school level?

Research Hypotheses

The following null hypotheses were tested in this study:

Ho1: Problem-based learning strategy has no significant effect on primary school pupils' innovative thinking.

Ho2: Problem-based learning has no significant effect on pupils' acquisition of creativity skills at primary school level.

Methodology

This study was conducted in Ikorodu Local Government Area of Lagos State. Survey and quasi-experimental research designs were employed in the study. The population for the study was two hundred and two (202) primary five pupils and five (5) primary five teachers found in the in two randomly selected primary schools in the chosen local government area. The sample size for the study was ninety-three (93) participants; comprising of forty (40) male and forty-eight (49) females primary five pupils and five (5) primary five teachers. Two public primary schools were selected using simple random technique. Also, simple random sampling technique was used to select only one intact primary five class per school. This put the number of classes used at two. The number of pupils in the first class was forty-three (43) and the second class was forty-five (45). Consequently, the forty-three (43) pupils in the first class were assigned the treatment group; while the forty-five (45) pupils in the second class were assigned the control group. Also, all the five (5) primary five teachers found in the sampled schools were used for this study. Three researchers-designed instruments were used for data collection in this study. These were Creativity Skills Teaching Questionnaire (CSTQ), Pupils' Innovative Thinking Questionnaire (PITQ) and Pupils' Achievement Test on Creativity Skills (PATCS). The CSTQ contained ten (10) items; PITQ contained five items; while the PATCS contained fifteen (15) items. These three instruments were subjected to both face and construct validity. In addition, Cronbach's Alpha method was used determining the reliability of the research instruments. The reliability coefficients obtained for CSTQ, PITQ and PATCS were 0.78, 0.83 and 0.81 respectively. The data collected were analysed using mean, standard deviation and Analysis of Variance (ANOVA) at 0.05 level of significance.

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Results

Research Question One: What is the level of teachers' knowledge of problem-based learning at primary school level?

Table 1: Level of teachers' knowledge of problem-based learning at primary school

S/N	Items	Mean	Standard deviation	Remarks
1	Level of understanding of the basic principles of Problem-Based Learning (PBL).	1.60	0.53	Moderate
2	Knowledge of the steps involved in implementing PBL in the classroom.	1.00	0.00	Low
3	Ability to design real-life problems that promote critical thinking in PBL.	1.60	0.53	Moderate
4	Knowledge of the resources/materials needed for effective PBL implementation.	1.40	0.55	Low
5	Ability to provide appropriate scaffolding to support students during PBL activities.	1.20	0.56	Low
	Grand Mean	**1.36**	**0.43**	**Low**

Source*:* Field Survey, 2024

Scales: Very High (x ≤4), High (x ≤3), Moderate (x ≤2), Low (x ≤1)

Table 1 shows the level of teachers' knowledge of problem-based learning at primary school level. The grand mean of the five items is 1.36 with a standard deviation of 0.43. This is an indication that the level of teachers' knowledge of problem-based learning at primary school level is low.

Research Question Two: What is the effect of problem-based learning strategy on primary school pupils' innovative thinking?

Table 2: Pre-test and Post-test Scores on pupils' innovative thinking in the treatment and control groups

Groups	Treatment Group			Control Group			Mean
Type of Test	**N**	**Mean**	**S.D**	**N**	**Mean**	**S.D**	**Differences**
Pre-test	43	14.98	1.10	45	14.79	1.12	0.19
Post-test	43	29.53	1.03	45	15.01	1.14	14.52
Mean Differences	-	14.55	-	-	0.22	-	

Source*:* Field Survey, 2024

Table 2 shows the effect of problem-based learning on primary school pupils' innovative thinking. The mean difference between the pre-test scores of the pupils in the experimental group and control group on innovative thinking at the primary school level is 0.19; while the mean difference between the post-test scores of the pupils in the experimental group and control group on innovative thinking at the primary school level is 14.52. This is an indication that the pupils in the treatment group performed better than those in the control group on innovative thinking. Based on these results, it can be inferred that problem-based learning strategy has positive effect on primary school pupils' innovative thinking.

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Research Question Three: What is the effect of problem-based learning on pupils' acquisition of creativity skills at the primary school level?

Table 3: Pre-test and Post-test Scores on Acquisition of Creativity Skills for pupils in the treatment and control groups

Groups	Treatment Group			Control Group			Mean
Type of Test	N	Mean	S.D	N	Mean	S.D	Differences
Pre-test	43	15.68	1.56	45	16.03	1.18	0.35
Post-test	43	30.42	1.28	45	17.12	1.12	13.30
Mean Differences	-	14.74	-	-	1.09	-	

Source*:* Field Survey, 2024

Table 3 shows the effect of problem-based learning on pupils' acquisition of creativity skills at primary school level. The mean difference between the pre-test scores of the pupils in the experimental group and control group on acquisition of creativity skills at primary school level is 0.35; while the mean difference between the post-test scores of the pupils in the experimental group and control group on acquisition of creativity skills at the primary school level is 13.30. This is an indication that the pupils in the treatment group performed better than those in the control group. Based on these results, it can be affirmed that problem-based learning has positive effect on pupils' acquisition of creativity skills at primary school level.

Testing of Hypotheses

Ho1: **Problem-based learning strategy has no significant effect on primary school pupils' innovative thinking**

Table 4: Effect of problem-based learning strategy on primary school pupils' innovative thinking

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	186.893	1	186.893	16.969	.001
Within Groups	947.241	86	11.014		
Total	1134.134	87			

Table 4 shows that the calculated f-value of 16.969 has a significant p-value of 0.001. This means that the value of "F" obtained is significant at 0.05 level, as the p-value (0.001) is less than 0.05. Based on these results, the null hypothesis which stated that "Problem-based learning strategy has no significant effect on primary school pupils' innovative thinking" is rejected. Hence, problem-based learning strategy has significant effect on primary school pupils' innovative thinking.

Ho2: Problem-based learning has no significant effect on pupils' acquisition of creativity skills at primary school level

Table 5: Effect of problem-based learning on pupils' acquisition of creativity skills at primary school level

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	198.563	1	198.563	20.968	.000
Within Groups	814.419	86	9.470		
Total	1012.982	87			

Table 5 shows that the calculated f-value of 20.968 has a significant p-value of 0.000. This means that the value of "F" obtained is significant at 0.05 level, as the p-value (0.000) is less than 0.05. Based on these results, the null hypothesis which stated that "Problem-based learning has no significant effect on pupils' acquisition of creativity skills at primary school level." is rejected. Hence, problem-based learning has significant effect on pupils' acquisition of creativity skills at primary school level.

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Discussion of the Findings

This paper found that the level of teachers' knowledge of problem-based learning at the primary school level is low. This implies that the teachers have little knowledge of problem-based learning at the primary school level. Supporting this finding, Turan and Gulsecen (2018) who investigated primary school teachers' knowledge and application of problem-based learning in classroom practice found that teachers had moderate knowledge of problem-based learning (PBL), but lacked skills in designing ill-structured problems. Similarly, Mohammed and Salisu (2019) explored teacher preparedness for implementing PBL in Basic science in Nigerian primary schools and found that teachers were willing but lacked resource materials, training, and experience. This is an indication that primary school teachers have little knowledge about the use of problem-based learning strategy at the primary school level. This aligns with Okeke and Asogwa (2022) who found that teachers had low-to-moderate knowledge of PBL, especially in assessment.

This study also found that problem-based learning strategy has significant effect on primary school pupils' innovative thinking. This means that primary school pupils' innovative thinking is significantly influenced with the use of problem-based learning strategy. Supporting the finding of this study, Nwosu and Okeke (2019) examined the effects of problem-based learning on pupils' creative and innovative thinking in primary science and found that pupils taught with PBL scored significantly higher in innovative thinking than those taught with lecture method. Similarly, Osei and Mensah (2021) reported that PBL significantly improved pupils' originality, elaboration, and flexibility. Equally, Bello and Ibrahim (2022) investigated the effect of problem-based learning on pupils' innovative mindset in northern Nigerian schools and found that Pupils exposed to PBL showed higher levels of inventive thinking and willingness to try new ideas. This implies that problem-based learning strategy has significant effect on primary school pupils' innovative thinking.

This paper revealed that problem-based learning has significant effect on pupils' acquisition of creativity skills at primary school level. This implies that the use of problem-based learning strategies has substantial positive effect on acquisition of creativity skills among the primary schools' pupils. This result aligns with Kim and Park (2019) who found that the use of problem-based learning enhances pupils' creativity; and Nwafor and Okeke (2020) who reported that pupils taught with PBL demonstrated superior fluency, flexibility, and originality compared to those taught using conventional approaches. Similarly, Adewuyi and Adebayo (2024) who explored problem-based learning intervention and innovative task performance among Nigerian primary school pupils found that pupils who participated in PBL lessons produced more innovative solutions, models, and explanations. This is an indication that problem-based learning strategies have significant effect on acquisition of creativity skills among the primary schools' pupils.

Conclusion

Adoption of problem-based learning strategy is crucial for pupils' development of creativity skills. This is based on the fact that the present study revealed that pupils exposed to PBL exhibited higher creative thinking abilities and acquisition of creativity skills than those taught through teacher-centred methods. Therefore, it can be concluded based on the findings of this study that problem-based learning strategies are effective for enhancing creativity skills among primary school pupils in Ikorodu Local Government Area of Lagos State.

Recommendations

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

1. Curriculum planners should embed problem-based tasks into primary school curriculum content. This will enhance teachers' knowledge of problem-based learning strategies at primary school level.

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2. Teachers should incorporate PBL into daily classroom instruction. This has the tendency to enhance primary school pupils' innovative thinking.
3. Pupils should be encouraged to engage in group projects and inquiry-based tasks. This will enhance acquisition of creativity skills among pupils at primary school level.

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