



EFFECT OF PROJECT-BASED TEACHING STRATEGIES ON COGNITIVE AND SOCIAL SKILLS DEVELOPMENT OF PRIMARY SCHOOL PUPILS IN OGUN EAST SENATORIAL DISTRICT

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Abstract

The study investigated the effect of project-based teaching strategy on cognitive and social skills development of primary school pupils in Ogun East Senatorial District of Ogun State. The main objective of this study was to investigate the main effect of project-based teaching strategies, attitude, and gender on cognitive and social skill development of primary school pupils. Quasi-experimental research design was adopted for the study. The population was primary six (6) pupils. A sample size of 154 pupils selected from four (4) public primary school took part in the study. Enumeration method was used to select Ogun State senatorial district. Purposive sampling was used to select a local government area. Two schools were assigned to an experimental and one control group using convenience sampling. Cronbach Alpha was used to validate instrument on cognitive and social skills development at index of 0.821. Moderating variables of Gender and attitude of learners were examined on the outcome variable. Data were analyzed, using inferential statistics of Analysis of Covariance (ANCOVA) were used to answer research questions and test the hypotheses at 0.05 level of significance. The results of the study indicate that the Experimental Group (project-based teaching strategies) performed better (mean score = 99.72) than the Control group (conventional strategy) (with mean score 92.9) confirming that treatment had differential effects on Cognitive Skills development among primary school pupils. Similarly, there is a significant main effect of treatment (project-based



strategy) on Social Skills Development among Primary School pupils ($F(2, 141) = 6.090, P < .05 = 0.003$). It was concluded from findings of the study that project-based teaching strategy had significant effect on cognitive and social skills development of primary school pupils. Based on the finding of the study, a step-by-step user-friendly teaching guides on project-based strategies should be designed by teachers to enhance the readiness and interest of primary school pupils towards learning.

Keywords project-based teaching strategy, cognitive skill, social skill, primary school pupils.

Introduction

Primary education is a basic level of teaching and learning for economic, political, social and cultural empowerment of learners, necessary for poverty alleviation and transformation of lives. At this level, beginners are often confronted with learning challenges, often traced to inappropriate and monotonous method of instruction, which could interfere with their ability to acquire knowledge and skills for foundation building and general development. There is need for teachers to adopt relevant and purposeful teaching strategies that will not only improve academic performance, but promote learners' readiness and inspire them for critical cognitive and social skills development. Social skills development in children is essential and plays important role in their learning and academic activities. Holistic development which comprises cognitive, affective, and psychomotor is expected in every child from birth until adulthood. Cognitive skill can simply be regarded as the skill acquired by individuals from birth till death which runs through some stages described by Jean Piaget (1896 - 1980), Swiss Psychologist who discovered cognitive development in children. He identified the four stages of cognitive development which include sensorimotor stage preoperational stage, concrete operational stage, and formal operational stage which runs from 12 years and above (McLeod, 2020). Cognition itself is characterized by reasoning, that is, the ability to process activities through thinking and thereby actualizing or creating the thought. The function of cognition in

development shows how information is being received, integrated, processed, and responded to through processes like divergent thinking, attention memory, convergent thinking, and executive function. These processes aid the learning activities of children whenever a concept is being introduced either within or outside the classroom and they aided the development of problem solving and critical thinking.

Apart from cognitive building, social skills development in children is essential and plays important role in their learning and academic activities. It focuses on different ways by which children relate and interact with their social environment which includes the school, home, religious organization, peer gathering, associations, and so on. Social skill development has the potential to aid children in developing all other skills like cognitive and psychomotor from the view that when a child is endowed with the ability to relate with others, either young or old, they have the cause to interact and exchange ideas which brings about reasoning; in the same vein, they engage in activities that improve both fine and gross motor (Rusmayadi & Herman, 2019). Social skill is described by Maleki, Mardani, Chehrzad, Dianatinasab, & Vaismoradi (2019) as being so essential in every child, as it enhances their mental wellness which is seen in the manner of relationship in the society, children's behaviourism, social competency, and response to social rules. It is therefore believed that when social skills are not well developed, children face the consequence



of loneliness, emotional unrest, poor relationship and interaction skill, and social maladjustment. Cognitive and social skills development of pupils during early childhood stage underscores the core elements of their learning experience towards adulthood.

A project approach is an in-depth exploration of a topic that may be child or teacher-initiated and involve an individual, a group of children, or the whole class. A project may be short-term or long-term depending on the level of children's interest. What differentiates the project approach from an inquiry one is that within the project approach there is an emphasis on the creation of a specific outcome that might take the form of a spoken report, a multimedia presentation, a poster, a demonstration or a display. The project approach provides opportunities for children to take agency of their own learning and represent this learning through the construction of personally meaningful artefacts. If utilised effectively, possible characteristics may include: active, agentic, collaborative, explicit, learner-focused, responsive, scaffolded, playful, language-rich and dialogic Jin et al., (2023).

Literature review suggested that project-based teaching method can be applied to all level of education Duc et al. (2022) and Song, (2023). The use of this approach in preschool education is inspired by the early childhood education program as practice at Reggio Emillio, in Italy. Project-based approach is said to meet the nature of children who love to explore and investigate. This approach defines education as a creative inquiry process that provides a rich learning environment, full of fun and excitement to children. In this approach, the task of teachers is not to give answers but to facilitate the process of learning, listening, researching and learning together with the children (Jin et al., 2023;

Binsaleh & Matcha, 2024) Project-based approach adopt a constructivist pedagogy that emphasis on deep learning process through inquiry method in which the child is preoccupied with issues and questions that are rich, alive and relevant to their daily live (Jumaat et al., 2017)

A curriculum that incorporates project-based strategy is required for a successful and memorable teaching and learning process. When project-based activity is initiated by children, they will be willing to learn and show positive dispositions to learning. Teachers' role in promoting project-based learning strategy is very crucial because as children project-based, teachers ought to observe in order to ensure that the strategy is not abused, and to determine whether pupils are making good use of it. Therefore, the study was conducted to investigate the effect of project-based teaching strategy on cognitive and social skills development of Primary school pupils in Ogun East Senatorial District of Ogun State. However, despite all the benefits of project-based strategies of teaching in primary schools, their effectiveness is subject to pupil's attitude. Attitude is the way an individual acts or reacts to something and it is part of individual characteristics. Attitude can influence learning outcomes as it plays an important role in the life of an individual (Iqbal et al., 2023. Gender is said to be the economic, social, political and cultural attributes and opportunities associated with being women and men. The social definitions of what it means to be a woman or man vary among cultures and change overtime. Gender is cultural expression of particular characterizes and roles that are associated with certain groups of people with reference to their sex and sexuality.

Statement of the Problem

There has been a great concern about the gradual loss of project-based during



teaching and learning processes in Primary schools as revealed by literature. This is also being advocated for in schools in Nigeria. Hence, Primary school teachers need to consider a paradigm shift from the popular or common conventional style of teaching Primary school pupils as a routine. Research findings have shown that teachers adopt teaching strategies with little or no knowledge about their relevance to lesson contents and when wrong teaching strategies are used to teach concepts without considering the relevant ones, ineffective learning outcomes could be obtained especially in the acquisition of social and cognitive skills.

In addition, the adoption of project-based strategy appears to be limited during teaching and learning process in Primary schools. Many researches have been conducted on the use of project-based in developing cognitive skills of children, but the use of project-based strategies to develop social and cognitive skills of learners has hardly been investigated. There is no evidence that it is widely adopted by teachers, in spite of their relevance to effective learning outcomes. Therefore, there is need for teachers to adopt teaching strategies that will not only improve academic performance, but promote learners' critical thinking abilities and social interaction. It is on this premise that the researcher believed that project-based teaching strategies could bring about the development of social and cognitive skills in Primary school pupils, using gender and attitude as moderators.

Objectives of the Study

The main objective of this study was to investigate the effect of project-based teaching strategy on cognitive and social skills development of Primary school pupils in Ogun East Senatorial District of Nigeria. Therefore, the following specific objectives of the study were achieved;

1. To investigate the main effect of project-based teaching strategy on cognitive skill development of Primary school pupils in Ogun East Senatorial District
2. To examine the main effects of gender on cognitive skill development of Primary school pupils
3. To determine the main effect of attitude on cognitive skill development of Primary school pupils.
4. To investigate the main effect of project-based teaching strategy on social skill development of Primary school pupils in Ogun East Senatorial District
5. To examine the main effects of gender on social skill development of Primary school pupils
6. To determine the main effect of attitude on social skill development of Primary school pupils.

Hypotheses

Ho₁ There is no main effect of treatment on Cognitive Skills Development among Primary School pupils

Ho₂ There is no significant main effect of gender on Cognitive Skills development among Primary School pupils

Ho₃ There is no significant main effect of attitude on Cognitive Skills development among Primary School pupils

Ho₄ There is no significant main effect of treatment on Social Skills development among Primary School pupils

Ho₄ There is no significant main effect of gender on Social Skills development among Primary School pupils

Ho₄ There is no significant main effect of attitude on Social Skills development among Primary School pupils



Methodology

This study is a quasi-experimental research design. It is a pretest-posttest non-equivalent control group design. It was carried out in Ogun East Senatorial District of Ogun State. The population of the study comprised of public primary school pupils in Ogun East Senatorial District made up of nine local government Area Ogun State, 474 public primary schools are in Ogun East Senatorial District. A sample of 154 Primary 6 learners from 30 intact classes was used in the study Purposive sampling was used to select the learners.

The instrument for data collection was modified pupils cognitive and social skill development questionnaire Attitude Towards Project-based Teaching Strategy (APTSQ), Social Skill Questionnaire (SSQ) rating Cognitive Development Skills (CSQ) rating scale, Gender on Cognitive Skills Questionnaire (GCSQ), Gender on Social Skills Development Questionnaire (GSSQ). The instrument has 2 sections, A and B. Section A has demographic data information of participants while B contains items on 4 rating scale which are divided into strongly Agree 4, Agree – 3, Disagree -2, strongly disagree 1 which amount to 30 items.

The items in section B were measured on a 4-point scale, strongly Agree 4, Agree – 3, Disagree -2, strongly disagree 1. The instruments validity was determined by experts. Cronbach alpha was used to determine the internal consistency of pupils cognitive and social skills development Social Skill Questionnaire (SSQ), Cognitive Development Skills (CSQ) which yielded alpha values of 0.05. The location of the sampled schools necessitated the involvement of some trained teachers by the researcher. They served as research assistants on the use of project-based teaching strategy. Instrument on pupils cognitive and social skills

development rating scale. Social Skill Questionnaire (SSQ), Cognitive Development Skills (CSQ) were administered to the participants in the treatment and control groups for pretest data collection. After administering pretest instruments to both experimental and control groups, treatment package on project-based teaching strategy was given, sticking strictly to the instructional guide prepared on Home Economics. Also, participants in the control group were conventionally taught without project-based method of teaching.

The classes for subjects in the treatment group and the control group were held during the normal time on the time table of the schools.

Each group was taught for 40minutes each day twice a week, for 8weeks. After intervention, instruments administered at pretest were re-administered to the participants in the experimental and control groups, to generate post-test data. Analysis of covariance (ANCOVA) was used to test the hypothesis at 0.05 level of significance.

Results

Table 1: Main effect of treatment on Cognitive Skills development among Primary School pupils.

Hypothesis 1: There is no significant main effect of treatment on Cognitive Skills development among Primary School pupils in Ogun East Senatorial District. To test this hypothesis, Analysis of Covariance (ANCOVA) was carried out and the result is presented in Table 1a.



Table 1: Tests of Between-Subjects Effects Dependent Variable: Posttest Cognitive Skills

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2902.055 ^a	12	241.838	4.075	.000	.257
Intercept	6479.167	1	6479.167	109.170	.000	.436
Pretest cog	224.573	1	224.573	3.784	.054	.026
Treatment	1396.988	2	698.494	11.769	.000	.143
Gender	38.169	1	38.169	.643	.424	.005
Attitude	497.463	1	497.463	8.382	.004	.056
Error	8368.282	141	59.350			
Total	1474258.000	154				
Corrected Total	11270.338	153				

a. R Squared = .257 (Adjusted R Squared = .194)

Main effect of treatment on Cognitive Skills Development among Primary School pupils in Ogun East Senatorial District.

Hypothesis 1

The hypothesis states that there is no main effect of treatment on Cognitive Skills Development among Primary School pupils in Ogun East Senatorial District.

Table 2: Dependent Variable: Posttest Cognitive Skills Estimates

Instructional Strategies adopted	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Project-Based Strategy	99.824 ^a	1.150	97.551	102.098
Conventional Strategy	92.891 ^a	1.146	90.625	95.157

a. Covariates appearing in the model are evaluated at the following values: Pretest Cognitive Skills = 96.3506.

The result of the Analysis of Covariance (ANCOVA) showed a statistically significant main effect of treatment on pupils' posttest cognitive skills, $F_{(2, 141)} = 11.77$, $p < .001$, with a partial eta squared of .143. This indicates that the project-based instructional strategy had a significant and meaningful effect on pupils' cognitive skills development after controlling for pretest cognitive skills.

Given this result, the null hypothesis was rejected. This implies that the project-based strategy significantly influenced cognitive skills development among primary school pupils in Ogun East Senatorial District. Further examination of the adjusted mean scores revealed that pupils exposed to the project-based strategy achieved higher

posttest cognitive skills scores (adjusted $M \approx 99.72$) compared with those taught using the conventional strategy (adjusted $M = 92.89$). This confirms that the project-based strategy was more effective in enhancing pupils' cognitive skills development than the conventional teaching approach.

Main effect of Gender on Cognitive Skills development among Primary School pupils.

Hypothesis 2

The hypothesis states that there is no significant main effect of gender on Cognitive Skills development among Primary School pupils in Ogun East Senatorial District.



The data in Table 2 revealed that there is no significant main effect of gender on Cognitive Skills development among Primary School pupils in Ogun East Senatorial District. ($F_{(1,141)} = 0.643$ $P > .05 = 0.424$). Based on this result, hypothesis 2

Table 3: Dependent Variable: Posttest Cognitive Skills Estimates

Sex of Pupils	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Male	96.965 ^a	.932	95.124	98.807
Female	97.992 ^a	.874	96.265	99.719

a. Covariates appearing in the model are evaluated at the following values: Pretest Cognitive Skills = 96.3506.

Table 3: Main effect of Attitude on Cognitive Skills development among Primary School pupils **Hypothesis 3:**

This hypothesis states that there is no significant main effect of attitude on Cognitive Skills development among Primary School pupils in Ogun East Senatorial District.

The Analysis of Covariance (ANCOVA) result indicated that gender did not have a statistically significant main effect on pupils' posttest cognitive skills, $F_{(1, 141)} = 0.64$, $p = .424$, with a partial eta squared of .005. Since the probability value is greater than .05, the null hypothesis was not rejected.

This result implies that there was no significant difference in cognitive skills development between male and female pupils after controlling for pretest cognitive skills.

was not rejected. Estimated Marginal Means. Hence, there is no significant main effect of gender on Cognitive Skills development among Primary School pupils in Ogun East Senatorial District

The adjusted mean scores presented in Table 2 further support this finding. Male pupils had an adjusted mean posttest cognitive skills score of 96.97, while female pupils had a slightly higher adjusted mean score of 97.99.

However, the difference between these mean scores was not statistically significant, as reflected in the overlapping 95% confidence intervals for male pupils (95.12–98.81) and female pupils (96.27–99.72).

In conclusion, gender did not significantly influence cognitive skills development among primary school pupils, indicating that both male and female pupils benefited similarly in terms of cognitive skills outcomes.



Table 4: Pretest Cognitive Skills

Attitude Level	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
High Attitude	99.396 ^a	.898	97.621	101.171
Low Attitude	95.561 ^a	.940	93.703	97.419

a. Covariates appearing in the model are evaluated at the following values: Pretest Cognitive Skills = 96.3506.

The result in table 4 showed that attitude had a statistically significant main effect on pupils' post-test cognitive skills, $F_{(1, 141)} = 8.38$, $p = .004$, with a partial eta squared of .056. Since the probability value is less than .05, the null hypothesis was rejected.

This finding indicates that pupils' attitude significantly influenced their cognitive skills development after controlling for pretest cognitive skills. The adjusted mean scores presented in Table 3 further clarify this effect. Pupils with a high attitude level recorded a higher adjusted mean post-test cognitive skills score ($M = 99.40$) compared with pupils with a low attitude level ($M = 95.56$).

The 95% confidence interval for pupils with high attitude (97.62–101.17) was higher than that of pupils with low attitude (93.70–97.42), with minimal overlap, suggesting a meaningful difference between the two groups. In conclusion, attitude had a significant effect on cognitive skills development among primary school pupils, with pupils who exhibited a high attitude demonstrating better cognitive skills outcomes than those with a low attitude.

Table 5 : Main effect of treatment on Social Skills Development among Primary School pupils in Ogun East Senatorial District

Hypothesis 4: There is no significant main effect of treatment on Social Skills development among Primary School pupils in Ogun East Senatorial District.

Table 5: Tests of Between-Subjects Effects Dependent Variable: Posttest Social

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	4799.706 ^a	12	399.975	6.372	.000	.352
Intercept	4122.308	1	4122.308	65.677	.000	.318
Pretest Soc	663.698	1	663.698	10.574	.001	.070
Treatment	764.467	2	382.234	6.090	.003	.080
Gender	.858	1	.858	.014	.907	.000
Attitude	532.484	1	532.484	8.484	.004	.057
Error	8850.061	141	62.766			
Total	1434066.000	154				
Corrected Total	13649.766	153				

a. R Squared = .352 (Adjusted R Squared = .296)



Table 4b: Dependent Variable: Posttest Social Skills Development Estimates

Instructional Strategies adopted (Treatment)	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Project Based Method	94.378 ^a	1.183	92.039	96.717
Conventional Method	93.776 ^a	1.198	91.408	96.145

a. Covariates appearing in the model are evaluated at the following values: Pretest Social = 94.5195.

The hypothesis was tested using Analysis of Covariance (ANCOVA), with posttest social skills development as the dependent variable and pretest social skills as a covariate. The result presented in Table 4a shows that the main effect of treatment on pupils' posttest social skills development was statistically significant, $F_{(2, 141)} = 6.09$, $p = .003$, with a partial eta squared of .080. Since the probability value is less than .05, the null hypothesis was rejected.

This result indicates that the instructional treatment had a significant effect on pupils' social skills development after controlling for pretest social skills. Specifically, the project-based strategy significantly influenced the development of pupils' social skills when compared with other instructional approaches.

The adjusted mean scores presented in Table 4b further explain the nature of this effect. Pupils exposed to the project-based strategy recorded an adjusted mean posttest social skills score of 94.38. This score was higher than that of pupils taught using the conventional method (adjusted $M = 93.78$). The 95% confidence interval for the project-based strategy (92.04–96.72)

suggests a measurable improvement in social skills development relative to the conventional approach.

In conclusion, the findings demonstrate that the project-based instructional strategy had a significant effect on social skills development among primary school pupils in Ogun East Senatorial District. Therefore, Hypothesis 4, which stated that there is no significant main effect of treatment on social skills development, was rejected.

Main effect of Gender on Social Skills development among Primary School pupils.

Hypothesis 5: This hypothesis states that there is no significant main effect of gender on Social Skills development among Primary School pupils in Ogun East Senatorial District. The data in Table 6 revealed that there is no significant main effect of gender on Social Skills development among Primary School pupils in Ogun East Senatorial District. ($F_{(1,141)} = 0.014$ $P > .05 = 0.907$). Based on this result, hypothesis 5 was not rejected. Estimated Marginal Means in Table 5 was determined to examine the differences in the posttest means of the two categories of gender.

Table 6: Dependent Variable: Posttest Social Skills Development Estimates

Sex of Pupils	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Male	95.852 ^a	.961	93.951	97.752
Female	95.698 ^a	.898	93.923	97.472

a. Covariates appearing in the model are evaluated at the following values: Pretest Social = 94.5195.



Main effect of Attitude on Social Skills development among Primary School pupils
 Hypothesis 6

This hypothesis states that there is no significant main effect of attitude on Social Skills development among Primary School pupils in Ogun East Senatorial District.

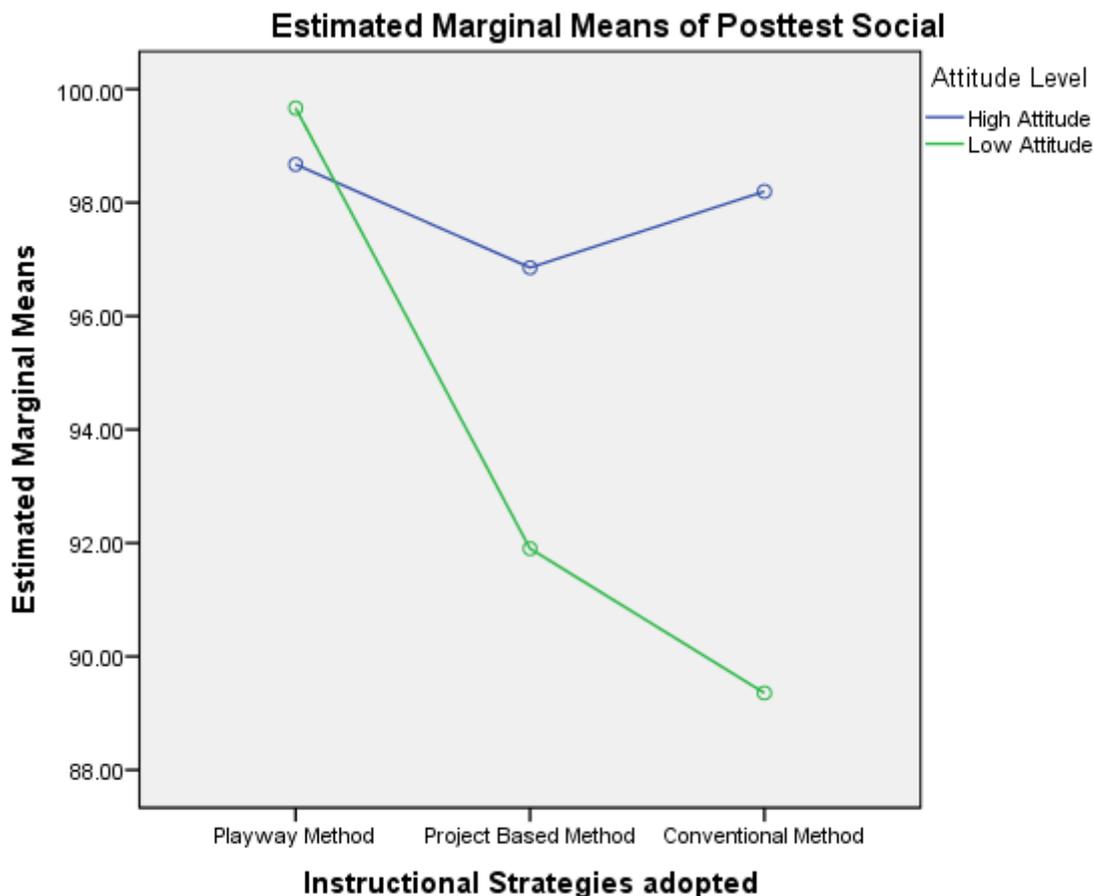
The data in Table 7 revealed that there is a significant main effect of Attitude on Social

Skills development among Primary School pupils in Ogun East Senatorial District. ($F_{(1,141)} = 8.484$ $P < .05 = 0.004$). Based on this result, hypothesis 4 was rejected. Estimated Marginal Means in table 6 was determined to examine the differences in the posttest means of the two categories of Attitude.

Table 7: Dependent Variable: Posttest Social Skills Estimates

Attitude Level	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
High Attitude	97.908 ^a	.953	96.025	99.792
Low Attitude	93.641 ^a	1.013	91.639	95.643

a. Covariates appearing in the model are evaluated at the following values: Pretest Social = 94.5195.



Covariates appearing in the model are evaluated at the following values: Pretest Social = 94.5195

Fig. 1: Treatment * Attitude



Discussion of Findings

Findings from data generated also indicated that there was significant effect of Project based teaching strategy on Cognitive Skills development among Primary School pupils, and it accounted more for the variance observed in the dependent variable. This was in line with the findings of Hermanto et al. (2020) who concluded that project-based strategy can improve students' cognitive skills of four graders for animal life cycle lesson. The average learning outcomes increase from sufficient to good category. Classical learning mastery increases from less good to excellent category. Project-based method enables children to develop cognitively, and become proficient in communication, negotiation, and collaboration skills. He further stated that it makes learners to brainstorm ideas and become good listeners to their group members, thereby making students to learn the basic skills required for productive communication, respect for others, and teamwork while bringing ideas together. Also, in the findings of Brau (2020), it was noted that Project-Based Method (PBM) is an approach that helps children to gain more knowledge on a subject through projects. Empirical findings on project-based teaching strategy have suggested that it can be applied to all level of education, and that the use of this approach in preschool education is inspired by the early childhood education programme (Jin et al., 2023).

Finding from the study also indicated that there was significant effect of Project based teaching strategy on the Social Skills development among Primary School pupils. This is not at variance with the study conducted by Rusmayadi & Herman (2019), where they asserted that when young learners are given the opportunity to handle projects on their own, it opens them up to different ways by which they relate and interact with their social environment

which includes the school, home, religious organization, peer gathering, associations, and so on. Findings of the study revealed that there was insignificant interaction effect of treatment and attitude on both cognitive and social skills development among Primary School pupils. This implies that attitude and gender from findings of the study did not significantly influence learning outcomes. Therefore, playway and project-based teaching strategy, when combined with gender and attitudes of learners, whether high or low do not have significant effect on cognitive and social skills development of primary school pupils.

Conclusion

Project-based teaching strategy was found to have significant effect on cognitive and social skills development of primary school pupils. The study indicated significant difference in pretest and posttest mean scores of the participants who received treatment on Project-based strategies than the participants in the control group. There was a significant main effect of attitude on cognitive and Social Skills development. The study revealed that there was no significant effect of gender on Cognitive and Social Skills development.

Recommendations

Based on the findings of the study, the following are recommended;

- i. Project-Based teaching strategy should be used by teachers for cognitive and social skills development of primary school pupils.
- ii. Teachers should work out modalities for inculcating positive attitude towards learning, when selecting teaching strategies for achievement of learning outcomes.
- iii. A step by step user friendly teaching guides on project-based strategies should be designed by teachers to



enhance the readiness and interest of primary school pupils towards learning

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