

Effect of Cooperative Learning Instructional Strategy on Social and Cognitive Skills Development of Primary School Pupils

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Abstract--- Cooperative Learning Strategy (CLS) aims to enable learners to work together towards a common goal. Effective cooperative learning promotes positive interdependence, individual accountability, face to face interaction and social skills development of the learners. Learners work together in small cluster or groups to achieve a common goal. Effective cooperative learning strategy relies on group management techniques, social skills training and learner-centred teaching methods. This study was guided by four research questions and six null hypotheses. The study adopted a quasi-experimental research design. The population of the study was 24,547 primary three pupils. The sample for the study was 176 pupils. A rating scale developed by the researchers on cognitive and social skills development was used as instrument for data collection. The instruments were validated by two experts in childhood education and one expert in measurement and evaluation. The reliability of the instruments were 0.79 and 0.82 for cognitive and social skills questionnaires respectively using Cronbach's alpha. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance. The result of the study, among others revealed that cooperative learning strategy enhanced primary school pupils' cognitive and social skills more than the conventional lecture method. It was also found that gender had no significant influence on primary school pupils' cognitive and social skills development. The result also showed that the difference between the cognitive and social skills development of the groups taught using cooperative instructional strategy and lecture method was statistically significant ($p < 0.05$). Based on these findings, the researchers recommended among others that workshops and conferences should be organized for the training of primary school teachers on the use of cooperative learning instructional strategy in primary school classroom instruction.

Keywords--- Cooperative Learning, Cognitive Skills, Social Skills, Gender.

I. Introduction

The basic aim of primary education is to prepare children for meaningful life and future academic endeavour. According to the Federal Republic of Nigeria in her National Policy on Education, primary education refers to the education given in an educational institution for children aged 6 to 11 years plus (Federal Republic of Nigeria, 2014). Since the rest of the education system is built upon it, the primary level is the key to the success or failure of the whole system. This is because rapid changes that occur during primary education determines all-round development of children. The goals of primary education in Nigeria as stipulated in the National Policy on Education include:

“to inculcate permanent literacy and numeracy and ability to communicate effectively; to lay a sound basis for scientific and reflective thinking; to give citizenship education as a basis for effective participation in and contribution to the life of the society; to mould the

character and develop sound attitude and morals in the child; to develop in the child the ability to adapt to his/her changing environment; to give the child opportunities for developing manipulative skills that will enable him/her to function effectively in the society within the limits of his/her capacity, and to provide the child with basic tools for further educational advancement, including preparation for trades and crafts of the locality”.

Apart from the benefits of primary education in nation building, primary education level is the bedrock of the child’s basic education and it is a very vital aspect of the nation’s educational system that deserves to be handled with great care and caution. Despite the importance of primary education to children’s development, it is sad to note that the development of cognitive and social skills of primary school pupils over the years have been poor and discouraging. Studies have shown that the poor and underdevelopment of cognitive and social skills of primary school pupils is as a result of consistent use of teacher centred teaching method or instructional strategy such as conventional lecture method of teaching (Kail, 2011). The poor and underdevelopment of cognitive and social skills of primary school pupils may be enhance when a learner centred instructional strategy is used during classroom instruction. An alternative to traditional lecture method is cooperative learning in which individuals learn in a small group with the help of each other which many at times lead to the development of cognitive and social skills of learners. One of these learner centred instructional strategies that may be able to enhance and promote primary school pupils’ cognitive and social skills is cooperative learning instructional strategy.

Cooperative learning refers to the instructional use of small groups in which pupils work together with the goal to increase their learning which might involve pupils' cognitive as well as social-emotional learning (Nneka, 2015) Through cooperative learning, pupils get a lot of opportunities to practice their group work skills. For instance, during cooperative learning all pupils get the chance to use various speech elements: ask questions, provide answers, give suggestions, and critically reflect on each other's ideas (Kolawole, 2007). Cooperative learning techniques, provide structure and guidance to group work. During cooperative learning activities, positive interdependence between group members is promoted. It promotes a situation in which pupils work together to maximize the learning of all group members, provide mutual support, share resources, and celebrate joint success. How primary school pupils perceive each other and interact with one another is a neglected aspect of instruction. Much training time is devoted to helping teachers arrange appropriate interactions between learners and materials, but how learners should interact with one another is relatively ignored. How primary school teachers structure pupil-pupil interaction patterns has a lot to say about how well they learn, how they feel about school and the teacher, how they feel about each other, and how much self-esteem they have. Cooperative learning instructional strategy when properly used by primary school teachers may enhanced the development of social and cognitive skills of the learners.

Social skill development of primary school pupils involves several interrelated areas of development, including social interaction, emotional awareness, and self-regulation (Chioma, et al., (2022). Social interaction focuses on the relationships pupils share with one another, including relationships with adults and peers. As children develop socially, they learn to take turns, help their friends, play together, and cooperate with others, emotional awareness includes the ability to recognize and understand one owns feelings and actions and those of other people, and how our own feelings and actions affect ourselves and others, while self-regulation is the ability to express thoughts, feelings, and behaviors in socially appropriate ways (Chioma et al., 2022). In order for children to attain the basic skills they need an important factor such as cooperation, following directions, demonstrating self-control and paying attention, they must have social-emotional skills. Feelings of trust, confidence, pride, friendship, affection and humor are all a part of a child’s social skill development. A child’s positive relationship with trusting and caring adults is the key to successful social skill development. Another skill that primary school pupils develop during cooperative learning is cognitive skill.

Cognitive skill development as active learning through “critical thinking and practical inquiry”, which grow out of experience but also involve imagination and reflection upon what is learned. They found achievement of cognitive presence to be dependent upon “appropriate teaching and learning skills”. Cognitive learning skills is define as “the extent to which pupils are able to construct and confirm meaning through sustained discourse in a community of inquiry (Chioma, et al., 2022). Cognitive skill occurs in an environment of effective teaching presence and satisfactory social presence. Cognitive skill development requires that learners encounter others who contradict their own intuitively derived ideas and notions and thereby create cognitive conflicts. The resolution of these conflicts leads to higher forms of reasoning. Thus, cognitive

learning skill is closely linked to interaction with others in the class, whether another pupil, or the teacher. The social and cognitive skill development of primary school pupils may be influenced by gender of the learner.

Gender is described as the subjective feeling of being a male or female irrespective of one's sex. Gender involves the societal expectations about the characteristics and likely behaviours of men and women (masculinity and femininity) (Nzeribe, 2008). Gender is also viewed as the socially constructed roles, learned behaviours and the expectations that are associated with females and males in the society. Gender involves both psychological and socio-cultural dimensions of being a man or woman (Ibe, et al., 2016). Operationally however, gender as used in this study could be seen as the roles and functions ascribed to male and females. As such, gender describes the individual's personal traits, roles and behaviours. It is of course the underlying reason why females view themselves as weaker vessels (feminine in nature) while males equally feel much stronger and more influential (masculine or manly in nature). This variable could influence the development of cognitive and social skills of primary school learners when cooperative instructional strategy is used.

However, results of existing empirical works on the interaction effect of instructional strategy and gender on pupils' achievement in primary school subjects had been no consensus among researchers. For instance, while Badamasi, (2015), Bhaskar and Mathur (2015) and Haliru (2015) in their independent investigations revealed that, instructional strategy and gender had no statistical significant interaction effect on male and female students' achievement and interest in school subjects, other scholars like (Filgona & Sababa, 2017) and (Obadaki & Omowumi, 2013). Revealed in their respective studies that, there was significant interaction effect of instructional method and gender on students' academic achievement. The above observations indicate that, instructional strategy and gender can influence students' academic achievement. Meanwhile, there are no research evidences on the effect of gender on primary school pupils' cognitive and social skills development when using cooperative instructional strategy during classroom instruction in the study area. Besides, findings of existing empirical works are inconclusive regarding the influence of gender on students' achievement in school subject.

The general purpose of the present study is to investigate the effect of cooperative learning instructional strategy on primary three pupils' social and cognitive skills development in Cross River State, Nigeria. Specifically, the present study addresses the following research questions. (i) What is the effect of cooperative learning instructional strategy on pupils' social skills development? (ii) What is the effect of cooperative learning instructional strategy on pupils' cognitive skills development? (iii) What is the influence of gender on pupils' social skills development? (iv) What is the influence of gender on pupils' cognitive skills development? Six null hypotheses were formulated to guide the study as follows; (i) There is no significant difference between the mean rating score of social skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method; (ii) There is no significant difference between the mean rating score of cognitive skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method; (iii) There is no significant influence of gender on pupils' social skills development; (iv) There is no significant influence of gender on pupils' cognitive skills development; (v) There is no significant interaction effect of instructional strategy and gender on pupils' social skills development; (vi) There is no significant interaction effect of instructional strategy and gender on pupils' cognitive skills development.

II. Methodology

A quasi-experimental design was adopted for this study. Specifically, the non-equivalent control group design was used. According to Nworgu (2015), the non-equivalent control group design is a unique quasi experiment in which randomization of subjects to experimental and control groups is not possible, rather it allows the researcher to use two streams of classes or intact groups (which are not equivalent) and can be assigned randomly to treatment conditions. The design is therefore considered appropriate for this study because intact classes from two sampled schools were used rather than assigning subjects randomly to groups. This of course was to avoid the possible disruption of existing classes, school registers and school organization which are common in subject randomization. Thus, the intact classes were further assigned randomly to the two groups; A (experimental group) and B (Control group) respectively. The design is symbolically represented thus:

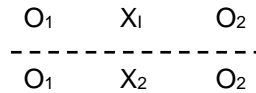


Figure 1: A Quasi-experimental design: The non-equivalent control group design.

Where;

- O₁ refers to pretest
- O₂ refers to post-test
- X₁ refers to treatment given to the experimental group
- X₂ refers to treatment given to the control group
- refers to non-equivalent groups.

The population of the study was 24,547 primary three pupils in public primary schools in Cross River State, Nigeria, while the sample for the study was 176 pupils from four intact classes in the study area. Out of these schools, one school with two intact classes was exposed to cooperative learning strategy while the remaining two intact classes from another school were taught using lecture method. A rating scale developed by the researchers on cognitive and social skills development was used as instrument for data collection. The instruments had 15 items each. The instruments were validated by two experts in childhood education and one expert in measurement and evaluation. The reliability of the instruments was established using Cronbach's Alpha and it yielded coefficients of 0.79 and 0.82 for cognitive and social skills questionnaires respectively. Before the commencement of the experimental teaching, one-day training was organized by the researchers to train the teachers who were drawn from the sampled schools as research assistants. The teachers from the school that was used as experimental group were specifically trained on how to use cooperative instructional strategy during classroom instructions, while the teachers from the control group were not trained but were asked to use the conventional lecture method.

The experiment lasted for six weeks. Before the commencement of the experiment, the teachers from both the experimental and control groups were ask to rate the pupils using the social and cognitive skills development rating scale, which the researchers used as pretest. After the six weeks of experiment, the teachers were asked to rate the pupils again using the same instrument, which now served as posttest. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance.

III. Results

The result of the study is presented according to the research questions and null hypotheses that guided the study.

Research Question One

What is the effect of cooperative learning instructional strategy on pupils' social skills development?

Table 1: Mean and Standard deviation of pretest and posttest rating of the effect of cooperative learning instructional strategy on pupils' social skills development

Instructional Mode	N	Pretest		Posttest		Mean gain
		\bar{x}	SD	\bar{x}	SD	
Cooperative learning	82	34.60	4.90	55.43	2.07	20.83
Lecture Method	94	32.72	4.26	42.55	5.02	9.83

Results in Table 1 show that the experimental group taught using cooperative instructional strategy had a pretest mean rating (social skills development) of 34.60 with a standard deviation of 4.90 and a posttest mean of 55.43 with a standard deviation of 2.07. The difference between the pretest and posttest mean for the experimental group was 20.83. The control group taught using lecture method had a pretest mean of 32.72 with a standard deviation of 4.26 and a posttest mean of 42.55 with a standard deviation of 5.02. The difference between the pretest and posttest mean for control group was 9.83. However, for each of the groups, the posttest means were greater than the pretest means with the experimental group having the higher mean gain. This is an indication that cooperative instructional strategy had some effects on primary school pupils' social skill development more than the conventional lecture method.

Research Question Two

What is the effect of cooperative learning instructional strategy on pupils' cognitive skills development?

Table 2: Mean and Standard deviation of pretest and posttest rating of the effect of cooperative learning instructional strategy on pupils' cognitive skills development

Instructional Mode	N	Pretest		Posttest		Mean gain
		\bar{x}	SD	\bar{x}	SD	
Cooperative learning	82	37.52	9.10	50.96	5.94	13.44
Lecture Method	94	34.93	6.34	45.21	4.36	10.28

Results in Table 2 show that the experimental group taught using cooperative instructional strategy had a pretest mean rating (cognitive skills development) of 37.52 with a standard deviation of 9.10 and a posttest mean of 50.96 with a standard deviation of 5.94. The difference between the pretest and posttest mean for the experimental group was 13.44. The control group taught using lecture method had a pretest mean of 34.93 with a standard deviation of 6.34 and a posttest mean of 45.21 with a standard deviation of 4.36. The difference between the pretest and posttest mean for control group was 10.28. However, for each of the groups, the posttest means were greater than the pretest means with the experimental group having the higher mean gain. This implies that cooperative instructional strategy had some effects on primary school pupils' cognitive skill development more than the conventional lecture method.

Research Question Three

What is the influence of gender on pupils' social skills development?

Table 3: Mean and Standard deviation of the influence of gender on pupils' social skills development

Gender	N	Pretest		Posttest		Mean gain
		\bar{x}	SD	\bar{x}	SD	
Male	100	33.74	4.55	48.71	7.29	14.97
Female	76	33.42	4.82	48.35	7.91	14.93

Results in Table 3 show that the male pupils had a pretest mean rating (social skills development) of 33.74 with a standard deviation of 4.55 and a posttest mean of 48.71 with a standard deviation of 7.29. The difference between the pretest and posttest mean for the male pupils on social skills development was 14.97. The female pupils had a pretest mean rating of 33.42 with a standard deviation of 4.82 and a posttest mean of 48.35 with a standard deviation of 7.91. The difference between the pretest and posttest mean for female pupils on social skills development was 14.93. However, result showed that for both male and female pupils, the posttest means were greater than the pretest means with the male having slightly higher mean gain. This implies that the male pupils developed slightly higher social skills than their female counterparts.

Research Question Three

What is the influence of gender on pupils' Cognitive skills development?

Table 4: Mean and Standard deviation of the influence of gender on pupils' cognitive skills development

Gender	N	Pretest		Posttest		Mean gain
		\bar{x}	SD	\bar{x}	SD	
Male	100	36.23	7.84	48.27	6.25	12.04
Female	76	36.02	7.87	47.39	5.40	11.37

Results in Table 4 show that the male pupils had a pretest mean rating (cognitive skills development) of 36.23 with a standard deviation of 7.84 and a posttest mean of 48.27 with a standard deviation of 6.25. The difference between the pretest and posttest mean for the male pupils on social cognitive skills development was 12.04. The female pupils had a pretest mean rating of 36.02 with a standard deviation of 7.87 and a posttest mean of 47.39 with a standard deviation of 5.40. The difference between the pretest and posttest mean for female pupils on cognitive skills development was 11.37. However, result showed that for both male and female pupils, the posttest means were greater than the pretest means with the male having slightly higher mean gain. This implies that the male pupils developed more cognitive skills than their female counterparts.

Hypothesis One

H₀₁: There is no significant difference between the mean rating score of social skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method.

Table 5: Analysis of Covariance (ANCOVA) of the difference between the mean rating score of social skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Dec.
Corrected Model	7358.758 ^a	4	1839.689	120.500	0.00	0.738	
Intercept	7494.561	1	7494.561	490.896	0.00	0.742	
Pretest Social	.078	1	.078	.005	0.94	0.000	
Group	7011.328	1	7011.328	459.244	0.00	0.729	S
Gender	50.412	1	50.412	3.302	0.07	0.019	NS
Group * Gender	31.554	1	31.554	2.067	0.15	0.012	NS
Error	2610.674	171	15.267				
Total	424936.000	176					
Corrected Total	9969.432	175					

Note: $\alpha = 0.05$, S = Significant, NS = Not Significant

The result on Table 5 shows the ANCOVA of the difference between the mean rating score of social skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method. The result was statistically significant at ($F = 459.244$, $p = 0.00$, $\eta^2_p = 0.729$). Since the associated probability value of 0.00 is less than 0.05 set as level of significance, the null hypothesis is rejected. Thus, inference drawn is that there was a statistically significant difference between the mean rating score of social skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method. The result further showed the effect size of ($\eta^2_p = 0.729$), which indicates that 72.9% variance in pupils' social skills development is attributed to cooperative instructional strategy.

Hypothesis Two

H₀₂: There is no significant difference between the mean rating score of cognitive skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method

Table 6: Analysis of Covariance (ANCOVA) of the difference between the mean rating score of cognitive skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Dec.
Corrected Model	1635.670 ^a	4	408.917	15.695	0.00	0.269	
Intercept	16204.227	1	16204.227	621.941	0.00	0.784	
Pretest Cognitive	29.512	1	29.512	1.133	0.28	0.007	
Group	1261.953	1	1261.953	48.436	0.00	0.221	S
Gender	70.451	1	70.451	2.704	0.10	0.016	NS
Group * Gender	91.225	1	91.225	3.501	0.06	0.020	NS
Error	4455.279	171	26.054				
Total	409773.000	176					
Corrected Total	6090.949	175					

Note: $\alpha = 0.05$, S = Significant, NS = Not Significant

The result on Table 6 shows the ANCOVA of the difference between the mean rating score of cognitive skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method. The result was statistically significant at ($F = 48.436, p = 0.00, \eta^2_p = 0.221$). Since the associated probability value of 0.00 is less than 0.05 set as level of significance, the null hypothesis is rejected. Thus, inference drawn is that there was a statistically significant difference between the mean rating score of cognitive skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method. The result further showed the effect size of ($\eta^2_p = 0.221$), which indicates that 22.1.9% variance in pupils' cognitive skills development is attributed to cooperative instructional strategy.

Hypothesis Three

H₀₃: There is no significant influence of gender on pupils' social skills development

The result on Table 5 shows the ANCOVA of the influence of gender on social skills development of pupils. The result was not statistically significant at ($F = 3.302, p = 0.07, \eta^2_p = 0.02$). Since the associated probability value of 0.07 is greater than 0.05 set as level of significance, the null hypothesis is not rejected. Thus, inference drawn is that gender did not significantly influence social skills development of pupils. The result further showed the effect size of ($\eta^2_p = 0.02$), which indicates that only 2% variance in pupils' social skills development is attributed to the influence of gender.

Hypothesis Four

H₀₄: There is no significant influence of gender on pupils' cognitive skills development

The result on Table 6 shows the ANCOVA of the influence of gender on cognitive skills development of pupils. The result was not statistically significant at ($F = 48.436, p = 0.10, \eta^2_p = 0.016$). Since the associated probability value of 0.10 is greater than 0.05 set as level of significance, the null hypothesis is not rejected. Thus, inference drawn is that gender did not significantly influence cognitive skills development of pupils. The result further showed the effect size of ($\eta^2_p = 0.016$), which indicates that only 1.6% variance in pupils' cognitive skills development is attributed to the influence of gender.

Hypothesis Five

H₀₅: There is no significant interaction effect of instructional strategy and gender on pupils' social skills development

The result in Table 5 shows that an F-ratio of 2.067 and the associated probability value of 0.15 were obtained with respect to the significant interaction effect of instructional strategies and gender on pupils' social skills development. Since the associated probability value of 0.15 is greater than 0.05 set as level of significance, the null hypothesis is not rejected. Thus, the inference drawn is that the interaction effect of instructional strategy and gender on pupils' social skills development is not statistically significant. This result is further explained using an interaction graph below which shows that there was no significant interaction effect of instructional strategies and gender on pupils social skills development. This is evidenced in the graph as the lines representing instructional strategies and gender did not intercept at a point as shown in the graph below.

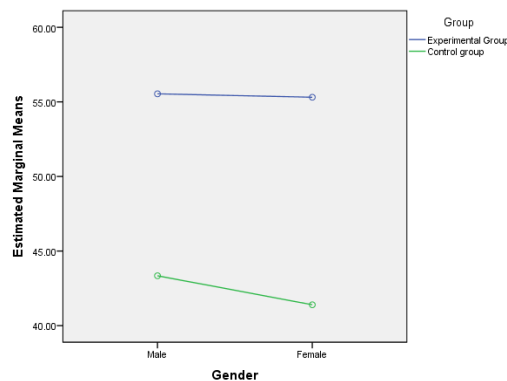


Fig 2: Graph showing the interaction effect of instructional strategy and gender on pupils' social skills development.

Hypothesis Six

H₀₆: There is no significant interaction effect of instructional strategy and gender on pupils' cognitive skills development.

The result in Table 6 shows that an F-ratio of 3.501 and the associated probability value of 0.06 were obtained with respect to the significant interaction effect of instructional strategies and gender on pupils' cognitive skills development. Since the associated probability value of 0.06 is greater than 0.05 set as level of significance, the null hypothesis is not rejected. Thus, the inference drawn is that the interaction effect of instructional strategy and gender on pupils' cognitive skills development is not statistically significant. This result is further explained using an interaction graph below which shows that there was no significant interaction effect of instructional strategies and gender on pupils' cognitive skills development. This is evidenced in the graph as the lines representing instructional strategies and gender did not intercept at a point as shown in the graph below.

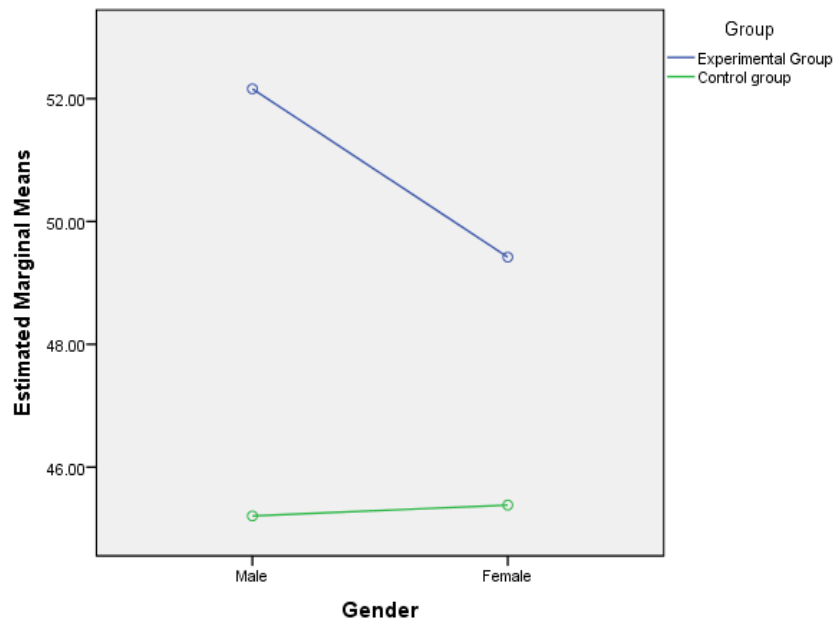


Fig 3: Graph showing the interaction effect of instructional strategy and gender on pupils' cognitive skills development.

IV. Discussion

Result from research question one which dwelt on the effect cooperative instructional strategy on social skills development of primary school pupils showed that cooperative instructional strategy had some effects on primary school pupils' social skill development more than the conventional lecture method. Result from the test of hypothesis one equally showed that there was a statistically significant difference between the mean rating score of social skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method. This implies that cooperative learning instructional strategy is more effective in developing primary school pupils' social skills. This result is consistent with Nneka (2015) who found among others that cooperative learning instructional strategy is effective in enhancing students' academic achievement in senior secondary school biology. This result is not surprising because in cooperating learning, learners interact freely and learn from each other instead of depending on the teachers' knowledge and explanations. This, no doubt sustains pupils' interest and develop their social skills during classroom instructions.

Results from the research two equally showed that cooperative learning instructional strategy proved to be more effective in developing primary school pupils' cognitive skill than the conventional lecture method. Result from the test of hypothesis two also showed that there was a statistically significant difference between the mean rating score of cognitive skills development of pupils taught using cooperative learning instructional strategy and those taught using conventional lecture method. This is an indication that

cooperative learning instructional strategy is an effective method that can be used to teach primary school pupils if the social and cognitive skills is to be properly developed. The result is consistent with Chioma et al (2022) who found among others that when children work together, their cognitive skills is developed more than when they work individually.

On the influence of gender on pupils social and cognitive skills development, result showed that there was no significant influence of gender on pupils' social and cognitive development. This implies that gender is not a significant factor in determining primary school pupils' social and cognitive development. This means that both male and female primary school pupils have the tendency to develop their social and cognitive skills irrespective of the instructional strategy used during classroom instructions. This may be the reason why results on the interaction effect of instructional strategy and gender on pupils' social and cognitive skills developed showed no interaction effect. This result was also shown in interaction graphs as presented in figures 2 and 3.

V. Conclusion

Based on the findings of the study, it is therefore concluded that cooperative learning instructional strategy is very effective in developing primary school pupils' social and cognitive skills. It is also concluded that gender is not a significant factor in determining pupils' social and cognitive skills development.

VI. Recommendations

Based on the results of the study, it is therefore recommended that;

1. Workshops, seminars and conferences should be organized for the training of primary school teachers on the use of cooperative learning instructional strategy in primary school classroom instruction.
2. Head teachers and school proprietors should supervise primary school teachers regularly to ensure that the use of learners' centered method of teaching is always used during classroom instruction, this will help to develop the social and cognitive skills of pupils.

VII. Acknowledgments

The authors acknowledge the head teachers who allowed their schools to be used for the research and also the classroom teachers who served as research assistants.

VIII. Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

IX. Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

X. Ethics Statement

This study was approved by the ethical committee of the department of Educational Foundations, University of Nigeria, Nsukka, Enugu State, Nigeria.

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