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EFFECT OF ROUND ROBIN INSTRUCTIONAL STRATEGY ON PUPILS' ACADEMIC PERFORMANCE IN NUMERACY IN ILORIN SOUTH LOCAL GOVERNMENT AREA OF KWARA STATE

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Abstract

This study investigated the effects of Round Robin teaching strategy on pupils' academic performance in numeracy in Ilorin South Local Government area of Kwara State. The study adopted a pre-test, post-test control group quasi-experimental design. Total number of 79 pupils were sampled from four selected schools in both public and private primary schools in Ilorin South Local Government area of Kwara State. Two instruments were used in the study, round robin instructional strategy treatment guide and 'Numeracy Academic Performance Test (NAPT)' were subjected to validity by the experts in department of early childhood and primary education Kwara state university, Malete and test-re-test reliability procedure was used to determine the reliability index of (r=0.78) was determined using Pearson Product Moment Correlation (PPMC). Four research hypotheses were raised and tested using inferential statistics of Analysis of Covariance (ANCOVA). The findings of the study revealed that round robin instructional strategy had significant effect on pupils' academic performance ($F_{(1;\ 70)} = 13.976$; $P < 0.05$) in numeracy. However, another finding also revealed that there was no significant main effect of round robin treatment and gender on pupils' academic performance in Numeracy ($F_{(1;\ 70)} = 1.077$; $P > 0.05$). Another finding reveled that there was no significant interactive effect of treatment and school type on pupils' academic performance in Numeracy ($F_{(1;\ 70)} = 13.390$; $P > 0.05$). Lastly, the finding revealed that there was no significant interactive effect of treatment, gender and school type on pupils' academic performance in Numeracy($F_{(1;\ 70)} = .028$; $P > 0.05$). The study concluded that round robin can improve pupils' academic performance in numeracy. Itwas recommended that the teacher should adopt the use of round robin instructional in teaching numeracy in their classroom. Also, Curriculum planners should incorporate the Round Robin teaching strategies in the pre-service teachers' program. Also, government and private school owners should organize or sponsor teachers to attend workshop or conference on the use of round robin instructional strategy.

Keyword: Academic Performance, Numeracy, Round Robin Instructional Strategy

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INTRODUCTION

Activities between teachers and the pupils are expected to produce learning outcomes in the learners. The goals and objectives of learning is usually determined by the academic performance of the pupils at the end of an academic session. When such an activity failed to produce a change in academic performance, then, there is a problem. With the current increase in pupils' poor academic performance, much demand is placed, and emphasis is laid on the teacher, the pupils, the curriculum and the environment in the whole process of teaching and learning (Abimbade, 2021). Despite the importance of knowledge to mankind and the efforts of researchers to improve teaching and learning, the performance of pupils remains low. Among the factors that have been identified as influencing outcomes are, inappropriate of instructional, pupils' attitude, laboratory in-adequacy, inappropriate and inadequacy of instructional materials, poor background (Adeyegbe& Adesoji, 2019). Numeracy is an essential subject which cuts across every human facet, and it is equally used in every human endeavor, it also plays a dominant role in the economic development of country. The significance of numeracy in producing versatile and resourceful leaders that are needed for economic development cannot be over emphasized. This is why Jacobs, (2016) affirmed that numeracy is the fundamental of science that is necessary for the understanding of most other field education. He stresses further that; it is obvious that no other subject forms such as strong force among the various branches of science.

Many reasons can be identified to be accountable for the poor academic performance of pupils in numeracy. It could be that pupils have difficulties in the lessons because generally they did not understand the basic concept of numeracy. Another problem related to pupils' poor academic performance could be the pupils' passive participation during the teaching and learning process. Other than that, the teacher also uses teacher-centered approach which made the pupils unable to explore themselves. The learning activities were repetitious and did not promote pupils' motivation in learning, while the last problem could be related to the materials used in teaching. Therefore, there must be a suitable technique for teaching and learning that can increase their knowledge and academic performance (Ahiakwo, 2013). According to Ango (2018), pupils' poor academic performance in numeracy globally is basically due to lack of involving the pupils in the teaching learning activities right from the beginning of any new concept to be taught, lack of qualified teachers as well as experiences in teaching and unavailability and/or insufficiency of materials in the laboratories. The teacher is the major manpower saddled with the responsibility of imparting the concepts considered fundamental to technology through the teaching of these basic concepts from the basic level.

Instructional strategy plays a vital role in ensuring quality education delivery. They are best known for the role of educating pupils in their care. Teachers use various instructional strategies such as lecture, small group activities and hands-on learning activities to impart knowledge to the pupils, beyond that, they serve many other roles in the classroom. The impact of the teachers in the performance of the pupils is germane. The teachers are the facilitators who are to impact into the pupils the concepts expected to be learnt. However, Olarewaju (2016) and Nwagbo (2017) were of the opinion that ignorant of the teachers or neglect of activity- oriented methods by the teachers grossly contributed to pupils' low performance. The performance of pupils in numeracy generally is a major concern to educators. Aghyeneku, et al., (2018) noted that pupils' academic performance in numeracy is low in both internal and external examinations.

This was why Adeniyi (2013) noted that pupils' academic performance in numeracy depends on the teachers' use of appropriate instructional strategy. The issue of instructional strategy in teaching and learning had been on course for decades. Scholars argued the necessity of learner centered approach for effective learning. Ngada in Fajonyomi (2017), emphasized that the success or failure of any educational program rests majorly on the appropriate used of instructional strategy (child-centered method of teaching). Seweje and Jegede (2015), noted that the ability of a teacher to teach is not derived only from one's academic background but it is based on outstanding pedagogical skill acquired.

Uses of round robin in the classroom as an instructional strategy had been a topic of study for many years. Round robin involves groups of pupils working to complete a common task. This is typically done with groups of two to four pupils; the smaller the group, the better. This produced higher performance outcomes than pupils working alone (Siegel, 2015). Kagan (2000) in his Cooperative Learning Book said, Round Robin is an oral technique. Teacher announces the topic to be shared with the team. Each team member shares with the team. Practically, class is divided into small groups of four to six with one person appointed as the recorder. A question is posed with many answers and pupils are given time to think about the answers. After the "think time", members of the team share responses with one another using round robin style. The recorder writes down the answers of the group members. The person next to the recorder starts recording or taking notes and each person in the group in order gives an answer until time is called. Kagan (2000) says that labelling strategies of cooperative learning like Round Robin are beneficial to the pupils because "pupils know exactly what to do" when instructed to use a specified strategy. According to Kagan, this is also helpful to instructors in that it helps facilitate communication among peers in learning from each other and how to teach.

According to Kambiss, (2012)Round Robin strategy is a brainstorming strategy where pupils are situated around a table in an academic discussion. Like other brainstorming sessions, pupils generate ideas on a specific topic or question. However, with this strategy, there is equal participation among pupils as well as multiple discussions taking place. The most effective thing about this strategy is that each pupil within the group has an equal opportunity to participate in the discussion. One child leads the discussion and then each pupil takes her turn voicing their opinion on the topic. In some cases, one pupil will be assigned the recorder where their job is to record everything that each pupil says. If the teacher finds that pupils are talking out of turn then sometimes, they will use "Talking chips," where pupils must turn in one chip each time, they voice their opinion. Tables are arranged around the classroom and positioned so that there are multiple brainstorming discussions taking place at one time. When the timer goes off or when the teachers say, each group moves to another table where the topic is different. Once groups have rotated to all tables, the Round Robin discussion strategy is accomplished.

Davidson (2016) reviewed related subjects that compared pupil knowledge achievement in pupil's small-group, using pupils-to-pupils interaction settings with the traditional whole-class instruction (Modified Lecture Strategy). In more than 40% of these studies, pupils in the classes using pupils-to pupils' small-group approaches significantly outscored control pupils on measures of pupils' performance. Grouping and mixing pupils by ability represent different ways teachers cope with diversity within the classroom (Kambiss, 2012). Blakey and Spence (2013), indicated that Round Robin teaching (RR) is one of the most effective strategies that develop the cognitive and the meta-cognitive processes for the pupils since it includes organizational procedures which enable them to choose the strategies of planning controlling and evaluating at their own pace. Round Robin also includes exchanging roles between the learners which make the pupils responsible for their roles in the teaching learning process and allows pupils to support each other continuously.

Gender and academic performance in mathematics has also been an area of discussion to researchers. Spence (2014) also in his study found no significant influence of gender on college students in science subjects, with the use of the cooperative learning strategy. Olatoye and Adekoya, (2020) found no gender difference in academic achievement of pupils exposed to different teaching strategies in numeracy. Okebukola (2021) found no gender difference in academic achievement in cooperative and competitive learning groups. Over the past 20 years, educational aspirations and performances in rural and urban areas are different, with the rural lagging behind those of their urban counterparts, also rural pupils place less value on academics. Musibau and Johnson (2020) in their studies stated that, there is no significant difference in pupils' performance in the urban and rural areas.

Considering school type and location influence on academic performance of pupils, Obe (2014) observed a significant difference in urban-rural performance of 480 primary six school finalist on the aptitude sub-tests of the (Nigeria) National Common Entrance Examination (NCEE). In his study tagged scholastic aptitude test, he concluded that children from urban schools were writing on locational influence on academic performance of pupils. The role of gender on pupils' academic performance cannot be overemphasized. Although, many scholars have argued that pupils' academic performance has no effect on gender. Pupils' gender can affect interaction in using round robin instructional strategy when groups are not inappropriate proportion according to variables. Udousoro (2013) in a study stated that, there is no significant difference in the interest of male and female pupils in numeracy but (Jegede, 2017) found out in a study that the female pupils have high interest in the learning of numeracy in basic schools than male pupils while Gardunio (2015) examine gender difference in round robin problem-solving in gifted pupils in numeracy. Garduno found no significant differences on the interest of pupils in numeracy in gender groups. Gender as an element in numeracy achievement has created a lot of concern for mathematics scholars or educators. These show that the issue of gender in mathematics performance is not yet been resolved.

Therefore, the need for further study is needed. If performance in both internal and external examination in numeracy is to be enhanced, more instructional strategies are needed to be adopted by teachers to facilitate the learning of difficult concepts. In the study conducted by Folaranmi, et., al (2019), the pupils increased in pupils' academic performance when the round robin instructional strategy was implemented in teaching. Also, in the study of Kim (2017), the numeracy class applying round robin strategy showed significant effect on improving mathematical concept and conceptual and academic performance of the pupils.

In this study, the researcher seeks to determine the effect of round-robin instructional strategy, it has been observed from the literature reviewed that study of this type has never been carried out in Ilorin South Local Government Area of Kwara State. Therefore, this is meant to fill the gap requiring empirical evidence regarding the effects of round robin instructional strategy on pupils' academic performance in numeracy in Ilorin south area of Kwara State.

Statement of the Problem

Researches have shown that pupils' academic performance in numeracy is not encouraging because pupils usually face a lot of problems in numerical situations. The situations exist due to the lack of interest in learning and lack of mathematical skills. Additionally, they do not have much interest in numerical because they do not understand the concept. Therefore, an enjoyable and appropriate instructional strategy is needed to improve pupils' performance in teaching and learning of numeracy. It is obvious that an instructional strategy used by a teacher in teaching and learning process of numeracy has important role to the pupils' performance. Based on the observation conducted by the researcher, there are problems related to numerical concept, skills and ability to solve numeracy situations. The pupils have difficulties in solving numerical problems which in turn caused poor academic performance of the pupils in numeracy. Other research has posited that the issue of poor academic performance is as a result of poor instructional strategies used by teachers. In lieu to that, studies have not been conducted but deserved research attention has not been given to the investigation of the effect of round robin instructional strategy on the academic performance of pupils in numeracy particularly in the basic school level. Also, this kind of study has not been conducted in Ilorin South Local Government Area of Kwara State.

Research Hypotheses

$H_0$1: There is no significant main effect of treatment on pupils' academic performance in numeracy in Ilorin South Local Government area of Kwara state.

$H_0$2: There is no significant interaction effect of treatment and gender on the academic performance in numeracyin Ilorin South Local Government area of Kwara state.

$H_0$3: There is no significant interaction effect of treatment and school type on the academic performance in numeracy in Ilorin South Local Government area of Kwara state.

Ho4: There is no significant interactive effect of treatment, gender and school type on pupils' academic performance in Numeracy in Ilorin South Local Government area of Kwara state

Methodology

The study adopted a pretest posttest control quasi-experimental research design with factorial design of 2X2X2. The target population were primary four (4) pupils in Ilorin South local Government area of Kwara State. Simple Random sampling technique was used to select two public and two private primary schools. The experimental group was made up of two schools (one private and one public) while the other two schools formed the control groups. The total number of 79 pupils were used for both the experimental and control groups in which the population of the pupils in experimental group were 43 while the total number of pupils in control group were 36. The research instruments used in the study were round robin instructional guide and researcher-designed performance test titled 'Numeracy Academic Performance Test (NAPT)'.Five weeks were used to carry out the exercise, the first week was used for the pre-test, second, third, and fourth week were used for the treatment, lastly the fifth week was used to conduct the instrument. The questions in NAPT were drawn from basic four numeracy scheme of work and it consisted multiple choice of questions. Before the instruments were adopted for administration, draft copies were given to experts in the department of early childhood and primary education. Kwara state university, Malete for validity of the instruments. To establish the reliability, test-retest method was used with an interval of two weeks. Pearson Product Moment Correlation (PPMC) was then used to determine the reliability coefficient and it yielded 0.78. The data collected was analyzed using inferential statistics of Analyzed of Covariance (ANCOVA). The hypotheses were tested at 0.05 level of significance.

Results

Testing the Hypotheses

Ho1: There is no significant main effect of treatment on pupils' academic performance in Numeracy

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Table: 1

Summary of Analysis of Covariance showing the main effect of treatment on pupils' academic performance in Numeracy

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	163.124[a]	8	20.390	8.717	.000
Intercept	841.418	1	841.418	359.719	.000
Pretest	8.235	1	8.235	3.521	.065
Main Effect					
Treatment	32.691	1	32.691	13.976	**.000**
Gender	.288	1	.288	.123	.727
School Type	1.305	1	1.305	.558	.458
Two way Interaction					
Treatment * Gender	2.520	1	2.520	1.077	.303
Treatment * School-type	31.320	1	31.320	13.390	.320
Gender * School type	.012	1	.012	.005	.944
Three way Interaction					
Treatment * Gender * School-type	.065	1	.065	.028	.868
Error	163.737	70	2.339		
Total	20137.000	79			
Corrected Total	326.861	78			

Table 1 shows the main effect of treatment on pupils' academic performance in Numeracy. There was significant main effect of treatment on pupils' academic performance in Numeracy ($F_{(1;\ 70)} = 13.976$; $P < 0.05$). The hypothesis was therefore rejected in the light of the result since the significant value (.000) is less than 0.05. This implies that treatment had significant main effect on pupils' academic performance in Numeracy in Ilorin South Local Government area of Kwara state. Table 2 presents the estimated marginal mean score.

Table 2

Estimated Marginal Mean Score of Pupil's academic performance by Treatment

			95% Confidence Interval	
TREATMENT	**Mean**	**Std. Error**	**Lower Bound**	**Upper Bound**
Round Robin Instructional Strategy	19.745[a]	.320	19.106	20.384
Conventional Method	14.870[a]	.301	14.269	15.470

Table 2. revealed that the significant main effect exposed by table 1 is as a result the significant difference between round robin instructional strategy and conventional method. This implies that pupils exposed to the Round Robin Instruction Strategy group had higher mean scores (mean = 19.745) perform significantly better than exposed to the conventional group (mean = 14.870).

Ho2: There is no significant interactive effect of treatment and gender on pupils' academic performance in Numeracy

Table 1 shows that there is no significant interactive effect of treatment, gender on pupils' academic performance in Numeracy($F_{(1;\ 70)}$ =.1.078; P >0.05). Therefore, hypothesis is not rejected in the light of the result since significant value (.303) is greater than 0.05. This implies that interactive effect of treatment and gender had no significant effect on pupils' academic performance in numeracy in Ilorin South Local Government of Kwara state.

Ho3: There is no significant interactive effect of treatment and school type on pupils' academic performance in Numeracy

Table 1 shows that there is no significant interactive effect of treatment and school type on pupils' academic performance in Numeracy ($F_{(1;\ 70)}$ =13.390; P >0.05). Therefore, hypothesis is not rejected in the light of the result since significant value (.320) is greater than 0.05. This implies that interactive effect of treatment and school type had no significant effect on pupils' academic performance in numeracy in Ilorin South Local Government of Kwara state.

Ho4: There is no significant interactive effect of treatment, gender and school type on pupils' academic performance in Numeracy

Table 1 shows that there is no significant interactive effect of treatment, gender and school type on pupils' academic performance in Numeracy($F_{(1;\ 70)}$=..028; P >0.05). Therefore, hypothesis is not rejected.in the light of the result since the significant (.868) is greater than 0.05 This implies that interactive effect of treatment, gender and school type had no significant on pupils' academic performance in numeracy in Ilorin South Local Government area of Kwara state.

Discussion of Findings

The findings of the study revealed that there was significant main effect of treatment on pupils' academic performance in Numeracy. This implies that pupils taught numeracy using round robin strategy significantly better than their counterpart taught with conventional method. This finding is in line with the earlier study byBlakey and Spence (2013) who reported the significant effect of treatment on pupils' achievement in numeracy using round robin strategy. Similarly, the finding support the finding of Kim (2017) who reported significant effect in the scores of low-scoring pupils in the uses of round robin instructional strategy.

Another finding of the study revealed that there was no significant interactive effect of treatment and gender on pupils' academic performance in Numeracy in Ilorin South Local Government of Kwara State. This finding is in tandem with finding of Olatoye and Adekoya (2009) who found no interactive effect of treatment and gender in academic achievement of pupils exposed to different teaching strategies in numeracy. Also, Spence (2014) in his study

found no significant influence of gender on junior secondary school students in mathematics subjects using round robin strategy.

The findings of the study further revealed that there was no significantinteractive effect of treatment and school type on pupils' academic performance in Numeracy in Ilorin South Local Government area of Kwara State. This

finding supported the finding ofMusibau and Johnson (2010) revealed in their study that school location had no significant main effect on pupils' academic achievement. This implies that whether a pupil attends rural or urban school it does not make a difference in his or her academic performance.

The findings of the study further revealed that there was no significant interactive effect of treatment, gender and school type on pupils' academic performance in Numeracy in Ilorin south local Government area of KwaraState. This finding is in tandem with Ogunleye (2012) who reported that there is no significant main effecton gender and urban and peri-urban schools in pupils' achievement in numeracy.

Conclusion

Based on the finding of the study, it was concluded that Round-robin instructional strategy has effectonpupils' academic performance than the conventional method regardless of pupils' gender and school type.

Recommendation

Based on the findings of this study, the following recommendations were made:

1. Teachers should adopt the use of round robin instructional strategy in their classroom.
2. Teachers should ensure a balanced distribution of gender participation opportunities and fostering equal engagement among all pupils in the classroom.
3. Seminars, workshops and conferences should be organized for teachers on how to use round robin instructional strategy by government at all levels.
4. Round robin instructional strategy should be included in the curriculum of Numeracy by curriculum planners.

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