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Research Paper

Differentiated Instructions and Numeracy Skills Achievement of Nursery Ii Pupils in Uyo Educational Zone, Akwa Ibom State

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Abstract
The purpose of this study was to investigate the effect of differentiated instruction and numeracy skills achievement of Nursery II pupils in Uyo Educational Zone, Akwa Ibom State. Three research questions and hypotheses were formulated to guide the study and were tested at 0.05 level of significance. The study adopted quasi-experimental research design; specifically, non-randomised pretest-posttest control group. The population of the study comprised 2500 pupils from private schools with a sample size of 200 Nursery II pupils selected through simple random sampling technique. Mathematics Achievement Test (MAT) was the instrument for the study and validated by validates. Kuder-Richardson Formula 21(K-R21) was used to ascertain the internal consistency of the instrument, which yielded a reliability co-efficient index of 0.84. Mean and standard deviation was used to answer research questions while analysis of covariance (ANCOVA) was used to test null hypotheses at 0.05 level of significance. The study revealed that pupils taught using differentiated instruction perform significantly better than those taught using conventional teaching methods. Also, there is a significant difference in the scores of boys and girls taught using differentiated instruction. There is no significant interaction effect of mode of instructions and gender on nursery II pupils mean achievement in numeracy Based on the findings of the study, it was recommended among others that teacher should integrate differentiated instruction into Mathematics lesson this will help the pupil develop self-competence in solving mathematics problem and help them overcome any challenges they might encounter in learning Mathematics.

Keywords: *Differentiated Instruction, Numeracy Skills, Pre-School*

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I. INTRODUCTION

It should be noted that not everyone is in support of early childhood education. Young children are not mature enough to learn complex task or skills that are required of them in the pre-school programmes. They also argue that the love and warmth of a mother is more important than any educational programme (Robinson and Robinson, 2002). On the other hand, some research evidence shows that early childhood education has a positive influence in children's affective, conceptual and social development in later years (Baker, 2003; Phillips and Dawson 2005). Despite the different views on early childhood education by scholars, the National Policy on Education (FRN, 2012) stipulates that it should be included in mainstream education. Formal education begins from pre-primary education as provided in day-care centers and nursery schools to children aged 3 through 5 years. It is enriched by the informal traditional upbringing given to children from 0 through 3 years which makes them ready for school.

The objectives of pre-primary education as stated in the National Policy of Education (FRN 2012) include; effecting a smooth transmission from the home to the school; preparing the child for the primary level of education; providing adequate care and supervision for the children while their parents are at work; inculcating in the child the spirit of enquiry and creativity through the exploration of nature and environment, art, music and playing with toys, etc; develop a sense of co-operation and team spirit; inculcating social norms; learn good habits, especially good health habits; and Teaching rudiments of numbers, letters, colours, shapes, forms etc. through play.

According to Achilles (2015) understanding the early development of numeracy can provide early

childhood educators and elementary school teachers with the tools they need to nurture mathematical thinking. Children think mathematically long before they start school, and there is substantial growth in numeracy skills during preschool. Such informal knowledge about numbers is often referred to as 'number sense' (August, 2007). At the pre-primary school stage, children learn to share and co-operate with others instead of developing the selfish tendencies. Basic numeracy skills consist of comprehending fundamental arithmetic's like addition, subtraction, multiplication, and division. For example, if one can understand simple mathematical equations such as 2 + 2 = 4, then one would be considered possessing at least basic numeric knowledge. Basic number concepts and skills (numeracy) generally emerge before school entry. It is important to promote the development of these competencies in young children and to know the best learning methods, as these skills are often predictive of children's future school achievement.

Numerical skills emerge during infancy and the preschool years when children are exposed to different quantitative and spatial relations in everyday activities (Kenway, 2008). At 12months babies typically can detect the difference between quantities of small sets of objects (e.g., a container with two blocks vs. one with three blocks), and they even can detect the difference between more numerous sets of objects if the ratio of one set to the other is large enough (e.g., 16 versus 32 dots). Toddlers gradually learn the names of numbers as they learn language. By 3 years of age many children have memorized 1 to 10 and are beginning to count small sets of objects successfully Children around 5 years of age learn to generate numbers with decade structures (i.e., teens, twenties), understand what numbers mean, learn to count increasingly large sets of objects, understand that the last number of a count is the number of objects in a set, and understand how to add and subtract. Many school-age children struggle to learn math concepts and skills.

Children think mathematically long before they start school, and there is substantial growth in numeracy skills during preschool. Such informal knowledge about numbers is often referred to as 'number sense' (Jodl, 2001). The teacher has to aware of the steps and methodology in developing numaracy in children are using early math skills throughout their daily routines and activities. This is good news as these skills are important for being ready for school. But early math doesn't mean taking out the calculator during playtime. Even before they start school, most children develop an understanding of addition and subtraction through everyday interactions. For example, Thomas has two cars; Joseph wants one. After Thomas shares one, he sees that he has one car left (Bowman, 2001).

More advanced mathematical skills are based on an early math "foundation" just like a house is built on a strong foundation (Yelland, 2012). In the toddler years, you can help your child begin to develop early math skills by introducing ideas like: Number Sense is the ability to count accurately first forward. Then, later in school, children will learn to count backwards. Representation is making mathematical ideas "real" by using words, pictures, symbols, and objects (like blocks). Spatial sense later in school this will be call "geometry." But for toddlers it is introducing the ideas of shape, size, space, position, direction and movement (Aziz, 2009).

One of the methods to use in teaching numeracy to children is by reading and singing number song sing songs that rhyme, repeat, or have numbers in them. Songs reinforce patterns (which is a math skill as well). They also are fun ways to practice language and foster social skills like cooperation. Another way is giving children the chance to play with wooden blocks, plastic interlocking blocks, empty boxes, milk cartons, etc. Stacking and manipulating these toys help children learn about shapes and the relationships between shapes, etc. (Hiebert, 2008). Low achievement in numeracy continues to remain a cause of concern and an impetus to reform efforts. Legislators, policy makers and the public, express dissatisfaction with pupils' ability to successfully acquire mathematical knowledge, skill, and the confidence they need to apply in succeeding. Nigeria is one of the many countries reporting low levels of mathematics achievement in its student populations, low achieving students are generally identified on the basis of performance on tests.

Many factors could be the cause of low achievement in Mathematics some factors are, lack of interest by the pupils, inappropriate teaching methods, shortage of staff, learner attitudes to the subject, math phobia, lack of teaching and learning resources and inexperienced teachers, etc. According to Greene (2019), recent years issues of pupils performance has been a big concern and one of the things to look at is the teaching methods and strategies use by the teacher, there has always been the usual teaching method what called traditional or conventional method were the teacher mostly is seen at the center of the classroom while the pupils will mostly be seen as passive learner, the has been much concern on how the teacher could make the lesson much of child centered which will allow the child to learn at his/her rate and develop their skills through an appropriate way. This study will unfold one among numerous instructional strategies that allows the children to learn base on their rates which is differentiated instructions.

Tomlinson (2001) describes differentiated instruction as factoring pupils' individual learning styles and levels of readiness first before designing a lesson plan. Also differentiating instruction means teaching the same material to all pupils using a variety of instructional strategies, or it may require the teacher to deliver lessons at varying levels of difficulty based on the ability of each pupils. Just as everyone has a unique fingerprint, every student has an individual learning style. Chances are, not all of your pupils grasp a subject in the same way or

share the same level of ability. So how can you better deliver your lessons to reach everyone in class? Consider differentiated instruction. To deploy differentiated instruction in the classroom the to consider the following:

- Design lessons based on students' learning styles.
- Group students by shared interest, topic, or ability for assignments.
- Assess students' learning using formative assessment.
- Manage the classroom to create a safe and supportive environment.
- Continually assess and adjust lesson content to meet students' needs. According to Tomlinson (2001) teachers can differentiate instruction through four ways: content, process, and product.

Content: As you already know, fundamental lesson content should cover the standards of learning set by the school district or state educational standards. But some students in your class may be completely unfamiliar with the concepts in a lesson, some students may have partial mastery, and some students may already be familiar with the content before the lesson begins. What could do is differentiate the content by designing activities for groups of pupils that cover various levels of Bloom's Taxonomy (a classification of levels of intellectual behavior going from lower-order thinking skills to higher-order thinking skills). The six levels are: remembering, understanding, applying, analyzing, evaluating, and creating. Pupils who are unfamiliar with a lesson could be required to complete tasks on the lower levels: remembering and understanding.

Process: Each student has a preferred learning style, and successful differentiation includes delivering the material to each style: visual, auditory and kinesthetic, and through words. This process-related method also addresses the fact that not all students require the same amount of support from the teacher, and students could choose to work in pairs, small groups, or individually. And while some students may benefit from one-on-one interaction with you or the classroom aide, others may be able to progress by themselves. Teachers can enhance student learning by offering support based on individual needs.

Product: The product is what the student creates at the end of the lesson to demonstrate the mastery of the content. This can be in the form of tests, projects, reports, or other activities. You could assign students to complete activities that show mastery of an educational concept in a way the student prefers, based on learning style.

A similar study was carried out by Duncan (2002) on the effectiveness of differentiated instructions and discussion methods in teaching numeracy to pupils. The study reveals a significant difference in both experimental and control. It was found more effective in improving counting ability. The study was carried out in a different location. Thus, the reviewed study was related based on the independent variable "differentiated instruction". The study design and respondents "nursery pupils" in the reviewed study are employed in the study. In another study carried out in Georgia by Clarke and Shinn (2004) revealed that there is a positive correlation between students' performance through their differentiated and traditional group.

In recent times in Nigeria, educational researchers on the issue of gender has become an issue of discuss. Some school of thoughts agrees that sex differences have a significant influence on student's performance, others disagree. At mixed schools, there was considerable variance supporting females, while at single-sex schools there is a no noticeable gap supporting males. The results indicated that single-sex schooling may possibly soften male hindrances in educational success. Olawoye and Salman (2008) noted that participation of females in the study of Mathematics, Science and Technology, particularly at the institutions of higher learning has been an issue of concern in developing countries like Nigeria. The females in most cases preferred to study in the areas of social sciences, arts, and humanities at the institutions of higher learning where credit pass in Mathematics is not required. This could be attributed to the belief that Sciences, Technology, and Mathematics are the male and the few gifted ones among the female students choice. Research reports have also indicated gender disparity in the admission of undergraduates in Sciences, Technology, and Mathematics.

In a study Pliner and Johnson (2004) found that all students, both boys and girls, exposed to small group learning strategy greatly improved numeracy achievement. Bulluck (2012) carried out a study on the effect of differentiated instructions on the achievement of male and female pupils in mathematics and found a significant difference between boys and girls exposed to differentiated instructions and those exposed to conventional methods not minding the sex of the child. Another study was carried out by Anizoba (2004) carried out a study on the effect of the writing process method on secondary school students' performance in English composition in Awka Education Zone of Anambra State, Nigeria. The study had gender as one of the variables of interest. The study compared the achievement of male and female students in English Composition as well as the interaction effect of method and gender on students' achievement in English composition. The study also adopted purposive and stratified random sampling techniques to draw four senior secondary two (II) students for the study; the instrument for data collection was essay writing. Data collected was analyzed using mean, standard deviation and analysis of covariance, the result of the finding showed that gender was not a significant fact in student achievement in English composition in essay writing. Also, no significant interaction effect of method and gender confirmed.

It would appear, from the above studies, that teaching method and gender as an influencing factors in learning and academic performance in aspects of Mathematics remains important but controversial. None of the reviewed studies was on conducted in Uyo Educational Zone; this leaves a gap in knowledge, thus creating a need for this present study.

Statement of the Problem

There have been complaints on the outcome of numeracy achievement among children in this study area. The issue cannot be emphasised without considering the school where the children have the space to shape their numeracy skills through the teacher's guidance. And when it comes to classroom learning, over time, the teacher had to use different conventional teaching methods to facilitate learning in children, and recent findings as proven very poor numeracy achievement. Children are unique, they are individuals, and no two children are alike: physically, emotionally, socially and intellectually, each child is a unique individual. Because children are unique, even if there are common needs and characteristics that children of a particular age or stage of development share, they must be understood by their parents and teachers in their uniqueness, and their individuality must be respected. There has been a concern about the poor performance of pupils in the Uyo Educational Zone, and this needs an urgent response by the researcher to ascertain what truly is the major cause(s) of low achievement in numeracy by pupils.

Teachers have a great role in the classroom by making all the pupils learn something new despite their differences. However, this does not mean that a teacher has to prepare 45 or 50 different lessons plans whether it is a single-grade or a multi-grade classroom. Instead, the teacher must get to know and understand each of the children and prepare teaching/learning activities that will respond to and reflect these children's individual needs. According to Gayer, Phillips and Dawson (2005), as children work individually or independently, in small groups or as a whole group, they will each benefit in their way from these activities. Most importantly, the teacher, who is primarily responsible for planning the daily activities the children will learn, should know every child and keep track of how well each child can learn.

Early numeracy achievement is a good sign that the child has a brighter prospect in the future when it comes to Mathematics. Uyo Educational Zone has many schools whereby numeracy skills are taught, but the achievement scores of pupils in the area is recorded low. This is attributed to instructional strategies. This situation encouraged the researchers to conduct this study to investigate the effect of differentiated instruction and numeracy skills achievement of Nursery II pupils in Uyo Educational Zone, Akwa Ibom State.

Objectives of the Study

The main objective of this study was to investigate effect of differentiated instruction and numeracy skills achievement of Nursery II pupils in Uyo Educational Zone, Akwa Ibom State. Specifically, this research intends to:

i. Determine the difference in the mean achievement scores of nursery II pupils in numeracy when exposed to differentiated instructions and those exposed to a conventional method.
ii. Ascertain the influence of gender (boys and girls) on the mean achievement scores of nursery II pupils in numeracy.
iii. Determine the interaction effect of mode of instruction and gender on mean achievement scores of nursery II pupils in numeracy.

Research Questions

The following research questions were stated to guide the study:

i. What is the difference in the mean achievement scores of nursery II pupils in numeracy when exposed to differentiated instructions and those exposed to a conventional method?
ii. What is the influence of gender (boys and girls) on the mean achievement scores of nursery II pupils in numeracy?
iii. What is the interaction effect of mode of instruction and gender on mean achievement scores of nursery II pupils in numeracy?

Null Hypotheses

The following hypotheses were formulated to guide this study and tested at 0.05 level of significance.

i. There is no significant difference in the mean achievement scores of nursery II pupils in numeracy when exposed to differentiated instructions and those exposed to a conventional method.
ii. There is no significant influence of gender (boys and girls) on the mean achievement scores of nursery II pupils in numeracy.
iii. There is no significant interaction effect of mode of instruction and gender mean achievement scores of nursery II pupils in numeracy.

II. RESEARCH METHOD

This study adopted quasi-experimental research design. Specifically, it is a pretest – post-test non-equivalent control group design. Quasi–experimental design is a design in which random assignment of subject to treatment and control groups is not possible (Ali, 2006). This design was adopted because there was no random assignment of subjects into experimental and control groups rather intact classes were used as experimental and control groups. The study was carried out in Uyo Educational Zone with a population comprised The population of the study comprised 2500 pupils from private schools with a sample size of 200 Nursery II pupils selected through simple random sampling technique. To achieve the principle of non-equalization in the two groups, the study made used of intact classes. The experimental group which was taught according to differentiated instruction and the control group was taught according to conventional method. The instrument for data collection was Mathematics Achievement Test (MAT). It consisted of two section A and B. Section A elicited information on demographic data and section B consisted of 10 items in the area of counting, recognition of numbers, knowledge of place value and the knowledge of addition and subtraction with a total mark of 10 marks. The instrument was adopted by the researcher and validated by three validates from Early childhood and Special Education and Mathematics teacher in Early Childhood Education. Their corrections and comments were used to modify the instrument. To determine the internal consistency of the instrument, trial testing was carried out using 20 educational technology fourth year students from the study area. Kuder Richardson Formula 21 was used to determine the internal consistency of the instrument which yielded reliability co-efficient index of 0.84, which is an indication that the instrument was reliable.

In regards to experimental procedure, firstly permissions were obtained from the sample schools, through a direct interaction and stating of purpose was used as a permit into the classroom. On the first day of the actual experiment two schools were randomly assigned from the study area to treatment and control group through simple balloting. The Mathematics achievement test I (pretest) was administered on all the nursery II pupils from the four sampled schools, in each of the groups this was possible through the help of an assistant research, after the pre-test the actual lesson started and lasted for 6weeks. Lesson plan was drowned for both control and experimental group, the first two weeks was for counting of numbers and recognition of numbers 1 to 20 it's was done in all the school, the researcher had already briefed the assistants and contracted the classroom teachers on how the should take the lesson. Week 3 to week 4 was for addition and subtraction of numbers, objectives of the lesson were all made and 30minutes was allotted to each lesson. In week 5 place value of numbers was taught in all the groups, two different lesson plan were drawn for the experimental and control group. The behavioural objectives and questions at the end of the lesson period were the same but the teaching strategies were different. The experimental group was taught using the differentiated instructions whereas the control group was taught using the conventional method. Finally in week 6 the post test was administered to both control group and the experimental group.

Mean ($\bar{X}$) and standard deviation (SD) were used in answering the research questions while analysis of covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. The pretest scores were used as covariates to the posttest scores. The ANCOVA was employed to partial out the initial differences between the experimental and control groups.

III. RESULTS

Research Question One

What are the mean achievement scores of nursery II pupils in numeracy when exposed to differentiated instructions and those exposed to conventional method?

Table 1: Mean achievement scores of Nursery II pupils in numeracy exposed to differentiated instructions and those exposed to conventional method

Method	Pre-Test			Post-Test		
	n	$\bar{X}$	SD	$\bar{X}$	SD	Mean Gain
Differentiated Instruction	100	21.3200	6.14288	47.0300	3.16054	25.71
Conventional Method	100	17.7400	6.49572	23.2400	9.12995	5.50

The analysis of the result in Table 1 on the mean achievement scores in numeracy of nursery II pupils exposed to differentiated instructions and conventional method shows that differentiated instructions has mean score for pre-test (n=100, $\bar{X}$= 21.3200, SD= 6.14288) and post-test (n=100, $\bar{X}$= 47.0300, SD= 3.16054) with a mean gain of 25.71. The result further shows that pupils exposed to conventional method has mean score for pre-test (n=100, $\bar{X}$= 17.7400, SD= 6.49572) and post-test (n=100, $\bar{X}$= 23.2400, SD= 9.12995) with a mean gain of 5.500. This result indicates that both differentiated instructions and conventional method improved pupils` academic achievement in numeracy. However, pupils exposed to differentiated instruction achieved higher in

numeracy than those exposed to conventional method.

Hypothesis One
There is no significant difference in the mean achievement scores of nursery II pupils in numeracy when exposed to differentiated instructions and those exposed to conventional method.

Table 2: Result of two-way ANOVA of the difference in the mean achievement scores of nursery II pupils taught numeracy using differentiated instructions and conventional method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	30275.907[a]	4	7568.977	203.202	.000	.807
Intercept	12595.334	1	12595.334	338.144	.000	.634
Pretest	1804.682	1	1804.682	48.450	.000	.199
Groups	21883.260	1	21883.260	587.494	.000	.751
Gender	198.139	1	198.139	5.319	.022	.027
Groups * Gender	3.808	1	3.808	.102	.750	.001
Error	7263.448	195	37.248			
Total	284433.000	200				
Corrected Total	37539.355	199				

a. R Squared = .807 (Adjusted R Squared = .803)

The result of the analysis in Table 2 above on the difference in the mean achievement scores in numeracy of nursery II pupils exposed to differentiated instructions and conventional method shows that an F-ratio of 587.494 with an exact probability value of 0.000 was obtained. Since the exact probability value of 0.000 is less than 0.05 level of significance, the null hypothesis is rejected. Hence, it is concluded that the mean achievement scores in numeracy of nursery II pupils taught using differentiated instruction and conventional method are significantly different. The result further showed the effect size of ($\eta^2_p = 0.751$), which indicates that 75.1 percent (75.1%) variance of the increase in mean achievement scores of nursery II pupils taught numeracy was due to the strategies.

Research Question Two
What is the influence of gender (boys and girls) on the mean achievement scores of nursery II pupils in numeracy?

Table 3: Mean achievement scores of nursery II pupils in numeracy based on gender (boys and girls)

Gender	Pre-Test			Post-Test		
	N	$\bar{X}$	SD	$\bar{X}$	SD	Mean Gain
Boys	112	19.6161	6.93112	33.7054	13.66764	14.0893
Girls	88	19.4205	6.08318	36.9545	13.68102	17.534

Table 3 shows the mean achievement scores of boys and girls in nursery II taught numeracy. The result shows that nursery II pupils who are boys have a pre-test mean score of (n=112, $\bar{X}$= 19.6161, SD=6.93112) and post-test (n=112, $\bar{X}$= 33.7054, SD= 13.66764) with a mean gain of 14.0893 while the pupils who are girls have pre-test mean score of (n=88, $\bar{X}$= 19.4205, SD= 6.08318) and post-test (n=88, $\bar{X}$= 36.9545, SD= 13.68102) with a mean gain of 17.534. The result shows that pupils who are girls achieved higher than pupils who are boys in numeracy.

Hypothesis Two
There is no significant influence of gender (boys and girls) on the mean achievement scores of nursery II pupils in numeracy.
The analysis of the result in Table 2 shows that an F-value of 5.319 with an exact probability value of 0.022 was obtained for the influence of gender (boys and girls) on the mean achievement scores of nursery II pupils in numeracy. The result shows that the probability value of 0.022 is less than 0.05 level of significance. Therefore, the null hypothesis is rejected. Inference drawn is, there is a significant influence of gender on pupils` achievement scores in numeracy. The result further showed the effect size of ($\eta^2_p = 0.027$), which indicates that only 2.70 percent (2.7%) variance of the increase in mean achievement scores of pupils taught numeracy was due to the influence of gender.

Research Question Three

What is the interaction effect of mode of instruction and gender on mean achievement scores of nursery II pupils in numeracy?

Table 4: Interaction effect of mode of instructions and gender on the mean achievement scores of nursery II pupils in numeracy

			Pretest		Posttest		
Strategies	**Gender**	**N**	$\bar{X}$	**SD**	$\bar{X}$	**SD**	**Mean Difference**
Differentiated instruction	Boys	53	21.74	6.42	46.41	3.67	24.67
	Girls	47	20.85	5.84	47.72	2.32	26.87
Conventional method	Boys	59	17.71	6.87	22.29	8.08	4.58
	Girls	41	17.78	6.01	24.61	10.41	6.83

Result on Table 4 shows the pretest and posttest mean score of the interaction effect of mode of instruction and gender on mean achievement scores of nursery II pupils in numeracy. From the result, the boys taught using differentiated instruction had a mean score of (n=53, $\bar{X}$= 21.74, SD= 6.42) at pre-test and ($\bar{X}$=46.41, SD= 3.67) at posttest. Girls taught using differentiated instruction have a mean score of (n=47 $\bar{X}$= 20.85, SD= 5.84) at pre-test and ($\bar{X}$= 47.72, SD= 2.32) at posttest. Result showed that the girls exposed to "differentiated instruction" had higher mean difference of 26.87 as compared to the boys who had 24.67. This implies that "differentiated instruction" proved to be more effective in increasing the mean achievement scores of nursery II girls in numeracy than boys. Table 4 also shows that boys taught using "conventional method" had a mean score of (n=59 $\bar{X}$= 17.71, SD= 6.87) at pre-test and ($\bar{X}$= 22.29, SD= 8.08) at posttest. Girls taught using conventional method have a mean score of (n=41 $\bar{X}$= 17.78, SD= 6.01) at pre-test and ($\bar{X}$= 24.61, SD= 10.41) at posttest. Result showed that the girls exposed to "conventional method" had higher mean difference of 6.83 as compared to the boys who had 4.57. This implies that "conventional method" equally proved to be more effective in increasing the mean achievement scores of nursery II girls in numeracy than boys.

Hypothesis Three

There is no significant interaction effect of mode of instruction and gender mean achievement scores of nursery II pupils in numeracy.

The result of analysis presented in Table 2 revealed an F-value of 0.102 with an associated exact probability value of 0.750 for the interaction effect of mode of instructions and gender of nursery II pupils on their mean achievement scores in numeracy. The result reveals that the exact probability value of 0.750 is greater than 0.05 level of significance. Hence, the null hypothesis is not rejected. Inference drawn is, there is no significant interaction effect of mode of instructions and gender on nursery II pupils mean achievement in numeracy. The result further showed the effect size of (η^2_p = 0.001), which indicates that only 0.1 percent (0.1%) variance of the increase in mean achievement scores of students taught numeracy was due to the influence of interaction effect of modes of instruction and gender. This result is shows that there is no significant interaction effect of modes of instructions and gender on nursery II pupils` mean achievement scores in numeracy.

IV. DISCUSSION OF FINDINGS

Hypothesis one aimed at finding out if there is a significant difference in the mean achievement scores of nursery II pupils in numeracy when exposed to differentiated instructions and those exposed to conventional method. It was found that there is a significant difference in the mean achievement scores of nursery II pupils in numeracy when exposed to differentiated instructions and those exposed to conventional method. This finding is in agreement with the work of Duncan (2002) who found a significant difference in both experimental and control. It was found more effective in improving counting ability. Similarly, this finding is in line with Clarke and Shinn (2004) who discovered that there is a positive correlation between students' performance through their differentiated and traditional group.

Hypothesis two equally investigated on the significant influence of gender (boys and girls) on the mean achievement scores of nursery II pupils in numeracy. It was found that significant influence of gender (boys and girls) on the mean achievement scores of nursery II pupils in numeracy. This finding is in line with that of Bulluck (2012) who discovered that a significant difference between boys and girls exposed to differentiated instructions and those exposed to conventional methods not minding the sex of the child. In contrary to the finding of this study, Pliner and Johnson (2004) found that all students, both boys and girls, exposed to small group learning strategy greatly improved numeracy achievement.

Hypothesis three testing interaction effect of mode of instruction and gender mean achievement scores of nursery II pupils in numeracy. It was found that that there is no significant interaction effect of modes of

instructions and gender on nursery II pupils` mean achievement scores in numeracy. The study of Anizoba (2004) also corrobates with the current study on comparing the achievement of male and female students in English Composition as well as the interaction effect of method and gender on students' achievement in English composition. The result of the finding showed that gender was not a significant fact in students' achievement in English composition in essay writing. Also, no significant interaction effect of method and gender confirmed.

V. CONCLUSION

Based on the findings of study, it is concluded that the is a significant difference between Nursery II pupils taught mathematics using differentiated instruction and those taught using conventional method. As it shows that means scores pupils in the experimental group performance far better than when they weren't exposed to differentiated instruction, while those in the control group were either performing lower or at the same rate this was after they received posttest. Also gender was another factor that was tested and the result shows that there was a significant interaction among their mode score, which means that differentiated instruction had effect on both boys and girls. One can say that there is a significant difference between the mean scores of pupils taught using differentiated instruction and those taught using conventional method in Uyo Educational Zone, Akwa-Ibom State.

Recommendations

From the findings and conclusions of this research, the following recommendations were made;

i. Since this study has reveal the effectiveness of differentiated instruction, teacher should integrate differentiated instruction into Mathematics lesson this will help the pupil develop self-competence in solving Mathematics problem and help them overcome any challenges they might encounter in learning Mathematics.

ii. Institution that is responsible for teacher preparation in early childhood should incorporate the use of differentiated instruction into their mathematics curriculum so as to equip the pre-service teacher with the competency needed in the use of this method.

iii. State ministry of education, universal basic education board and relevant professional association interested in improving the numeracy problems of the younger generation should organize workshops for the in service teachers to make them conversant with the proper and regular use of differentiated instruction in Mathematics.

REFERENCES

[1]. Achilles, C. M, (2015). Using differentiated strategy to teach mathematics to children with learning problem. Seminar in Government Schools 2(2):23–30.

[2]. August, D., and Hakuta, K (2007). Improving learning for low achieving children: A research agenda. National research council and institute of education. Washington, DC: National academy Press.

[3]. Anizoba, E. N. (2004). The effect of the writing process method on students' performance in English composition. Unpublished Ph.D Thesis, Faculty of Education, University of Nigeria, Nsukka.

[4]. Duncan, (2002). Effectiveness of differentiated instructions and discussion methods in teaching numeracy to pupils. Nigeria Journal of Computer Literacy (NJCL), 4, 82-101.

[5]. Baker G, (2003). Concept of teaching mathematics to children, Hagerstown, PA: Teachers College Press.

[6]. Bowman, B. (2007). Family support for children academic achievement 157–170 in Advances in Early Education and Day Care: Greenwich, CT: JAI Press, Inc.

[7]. Bulluck, E. T. (2012). The effect of differentiated instructions on the achievement of male and female pupils in mathematics. African Journal of Educational Research, 11 (1&2), 27 – 34.

[8]. Federal Republic of Nigeria (2012). National policy on education 6th edition. Abuja: NERDC Press.

[9]. Kenway, J. (2008). The ghosts of the school curriculum: Past, present and future. Aust. Educ. Res. 35**,** 1–13

[10]. Olawoye, F. A. and Salman, M. F. (2008). Education reforms in Nigeria: Implications for the Education of the Girl child. Being a paper presented at the 45th Annual National Conference of the Mathematical Association of Nigeria (MAN), held in Gusau Girls' Technical advance Teachers' College, Zamfara State, from 25th -29th August, 2008.

[11]. Philip, D. and Dawson, H. (2005). Learning challenges in diverse children with learning difficulty and exceptional children. Hilton University: City press.

[12]. Robinson, B. S. and Robinson, F. M. (2002). Stability and change in human characteristics leading to learning success among children. New York: Wiley.

[13]. Tomlinson, C. A. (2001). How to differentiate instruction in mixed-ability classrooms (2nd ed.). Alexandria, VA: ASCD.