CREATIVE ARTS INSTRUCTION AND MATHEMATICAL SKILLS ACQUISITION OF PRESCHOLERS IN UYO LOCAL GOVERNMENT AREA OF AKWA IBOM STATE

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ABSTRACT

The study investigated effect of creative arts instruction and mathematical skills acquisition of prescholers in Uyo Local Government Area: Implications for sustainable future. Quasi-experimental research design was adopted for the study and the population consisted of all 5,723 ECC I pupils in the 49 public primary schools in Uyo Local Government Area. 92ECC I pupils were randomly selected formed the sample for the study. The instrument used was Number Work achievement Test (NWAT) which was validated and the reliability co-efficient of 0.76 was obtained using Kuder Richardson Formula 21. Mean and standard deviation was used for answering the research questions; while null hypotheses were tested at p <.05 probability level using analysis of covariance (ANCOVA). The result obtained showed that there is a significant difference in pupils' ability to count numbers; ability to identify shapes; ability to compare quantity and ability to solve problems when taught using creative arts instruction and those taught using conventional method of instruction. Therefore, there is need for teachers, school and policy makers need to support creative arts instruction as a means of increasing pupils' mathematical skills acquisition as well as achievement. Appropriate recommendations were made based on the findings of the study.

Keywords: Creative arts, Mathematical skills, Early Childhood Education

Introduction

Learning is said to start from cradle to the grave. The child at birth has nothing to offer to himself or the society. Through learning he/she gradually adapts to his/her new world through guidance and directives. Man in his quest to transmit societal values that would transform the young child and make his society a better place to live, schemes for better ways of passing the desired knowledge and values that would make them functional. One of such ways is education. Education is the process of preparing the younger generation to be useful to themselves and society (Obanya 2013). Dienye in Morrison, Nyorere and Elekwa (2013) see education as the preparation of individuals to fit into different roles and activities for the transformation of society. This therefore implies that education must involve conscious engagements which include planning, implementation, and evaluation. It also demands that the direction of progress and transformation must be defined if progress must be made.

Education is derived from two Latin words "educare" and "educere". The former simply means, to train, to form or to mold. This implies that the society trains, forms and moulds the individual to achieve the societal needs and aspirations. The latter simply means, to build, to lead or develop (Mulligan and Mitchelmore, 2009). Fafunwa (1974) cited in Ayodele (2012) defined education as "what each generation gives to its younger ones which makes them to develop attitudes, abilities, skills and other behaviours which are of positive value to the society in which they live". To actualize the foregoing, every child in Nigeria needs functional education. On this basis, the Federal Republic of Nigeria stated in the National policy on Education (FRN, 2013), as one of its goals, is the "Development of appropriate skills, mental, physical and social abilities and competencies to empower the individual to live and contribute positively to the society". FRN (2013) further states that one of the specific goals of education in Nigeria is to "promote functional education for skill acquisition, job creation and poverty reduction." Obinaju (2004) opined that functional education inculcates the right attitudes, values, norms, abilities and skills in an individual to enable him function well in the society in which he/she belongs."

Early childhood education is the pre-school education given to children who are between the ages of two and half or three to six years. Young children are assisted to develop emotionally, socially and physically. Educationists have referred to early childhood education as crèche, kindergarten, pre-school, nursery school, day care etc. many scholars have variously defined early childhood education. Obinaju (2004) described early childhood education as the education or training given to a child from birth to entering the primary school. For Obinaju, early childhood education starts from a period when the child is totally dependent on the parents, especially the mother, for survival and satisfaction of needs to a period he can survive on his own. Ekaete (2004). opined that this level of education is the most vulnerable stages of the total process of education. She stated further that the cadre of education is aimed at giving children an academic head start as well as prepare them for primary school education. Maduewesi, (1999) as cited in Obinaju (2004) viewed early childhood education as the exposure of young children, from age three, through play-like activities to mental, social and physical learning, in a semi-formal setting until they attained the age of government approved for the commencement of formal learning or school. In some cases, however, the responsibility of teaching and bringing up children from birth to formal school age of five years, lie solely on parents and relatives. This is the practice in some places till date. Obinaju further asserted that the laying of a sound foundation for young children in the early years, would greatly impact positively on the future of the Nigerian society.

The importance of early childhood education has been emphasized in the National Policy on Education NPE (2013). The Federal Government of Nigeria, highlighted the objectives of early childhood education to be achieved as follows:

Effect a smooth transition for primary level from the home to the school; prepare the child for primary level of education; promote adequate care and supervision for the children while their parents are at work (on the forms, in markets, offices, etc); inculcate in child the spirit of inquiry and creativity through the exploration of nature, the environment,art, music and playing with toys etc; develop a sense of cooperation and team spirit; learn good habit, especially good health habit; and teach them rudiment of numbers, letters, colour shapes, form etc, through play.

The last of these objectives is to teach them rudiment of numbers, letters, colour shapes, form etc, through play. This implies that literacy and numeracy development of the child should not be compromised at the pre-primary school level. Numeracy is thus an activity concerned

with logical thinking, spotting patterns, posing premises and investigating their implications and consequences. It also involves the study of the properties of numbers and shapes; the relationship between numbers; inductive and deductive thinking and the formulation of generalizations. Numeracy is a creation of the human mind and therefore becomes primarily a way of thinking thus facilitating problem solving. Numeracy is thus the ability to reason and to apply simple numerical concepts (Brooks, 2010). Basic numeracy skills consist of comprehending fundamental mathematics 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. Substantial aspects of numeracy also include number sense, operation sense, computation, measurement, geometry, probability and statistics. A numerically literate person can manage and respond to the mathematical demands of life. By contrast, the lack of numeracy or innumeracy can have a negative impact if the skills are absent. Numeracy has an influence on career professions, literacy, and risk perception towards health decisions. Low numeracy distorts risk perception towards health decisions ((Brooks, 2010) and may negatively affect economic choices. Greater numeracy has been associated with reduced susceptibility to framing effects, less influence of non- numerical information such as mood states, and greater sensitivity to different levels of numerical risk. Numeracy development goes through various stages, at age 0–3years, a child is in a stage where it acquires the counting skills either using materials or in his/her head .This is followed by advanced counting when a child develops mastery at age 4 years of solving problems by counting in ones, skip counting. He or she progresses with age from early additive to arithmetic through advanced multiplication and proportional skills when he or she can engage in various problem solving activities (Canadian Childcare Foundation, 2009).

Mathematics is the science of patterns and layouts. In other words, it is the science of number, shape, space, size, and the relationships between them. Mathematics is also a universal language written with symbols and shapes. It involves information processing (editing, analyzing, interpreting and sharing), producing, predicting and solving problems (MEB 2009). Basic mathematical skills consist of analyzing, problem solving with addition, subtraction, multiplication, division, fractions, and decimals process skills etc. (Hayes, 2005). Mathematics education provides individuals with a wide perspective and knowledge to understand the world and enhance their social interaction and their skills. Mathematics helps people to analyze their various experiences, explain and solve problems systematically. It also facilitates creative thinking and provides aesthetic development. It accelerates the development of reasoning skills of individuals in various mathematical situations (MEB, 2009, p 7).

The term mathematical skills acquisition refers to a broad range of acquiring basic concepts such as counting (1, 2, 3); quantity (more, fewer); shapes (circles, squares, triangles); spatial relations (over, under); measurement (tall, short; bigger, smaller); and patterns (red, blue, red, blue) (National Research Council, 2009). Because children are naturally curious, they explore these concepts as they interact with their environment (Sarama and Clements, 2009). For example, young children explore math when they play and build towers with blocks. In building, they sort the blocks by size and color, notice spatial relationships, and develop reasoning skills as they learn which shapes can be placed on top of one another, which ones will topple the tower they have built, and how to combine shapes to create familiar objects. Preschoolers count or compare objects as they play, and explore patterns and shapes (Seo and Ginsburg, 2004). Children must interact with adults, however, to learn the words that represent the basic mathematical concepts and skills that they experience.

In regards tocreative arts instructionBrown, Benedett and Armistad, (2010) opined that arts integration has emerged at the forefront of elementary education reform in response to declining test scores. Catterall (2002) stated that "a renewed interest in arts education has been stimulated in large measureby public concern over the quality of American schools and the performance of ourstudents. The arts are seen as a part of an effective response to that concern". Creative arts instruction uses the arts as the means of teaching the curriculum. Fowler (1996) opined thatrelating arts to, and making them part of the basic curriculum they become the motivating energy of learning.

Creative arts instruction is "an approach to teaching in which pupils construct and demonstrate understanding through an art form. Pupils engage in a creative process which connects an art form and another subject area and meets evolving objectives in both" (Silverstein and Layne, 2010). Creative art is what brings creative thinking into mathematics. The word creativity originates in the Latin word "cero", which means "to do". Hallam, Gupta and Lee (2008)defined creativity as the ability to look at one thing and see another. Creative arts instruction is a teaching strategy that can make subject matter, ideas, and concepts more easily understood by connecting discrete curricula with the arts (Griffin and Miyoshi, 2009).According to Rabkin and Redmond (2006), the study of the arts can have a positive impact on pupil achievement resulting in increases in academic achievement. Rabkin and Redmond found increases in academic performance in mathematics and suggest that struggling pupils could benefit the most from instruction in the arts. The Multiple Intelligence theory is one theory that can explain the benefit of learning in the arts due to the many learning styles that the arts address.

The Multiple Intelligence (MI) theory, developed by Gardner (1993), suggests that people learn in different ways. Gardner presents eight intelligences in his Multiple Intelligence theory. He states that when children are taught classroom content while addressing their learning style, the content is more easily acquired by the student. Creative arts instruction utilize many of the learning styles noted in Gardener's MI theory. Mathematical Intelligence is the ability to use logic and understand numbers and number systems. The ability to reason and plan are characteristics of a logicalmathematical intelligence. A chess player is an example of a person with logical mathematical intelligence. A chess player can determine the impact of a move on an opponent before the move is made, thereby determining ahead of time if that move is the best possible move (Gardner, 1993).

Studies have shown that creative arts can improve pupils' academic achievement at all levels (April, 2001; Goldsmith, 2003; Richards, 2003; Finch 2004). April states that pupil achievement increases due to the rich and varied aspect of creative arts learning when connections between content areas are made. Instruction in the creative arts involves active learning that connects pupil learning style with the learning. Creative arts instruction can take the form of visual learning, auditory learning, or kinesthetic/tactile learning; the learning styles presented by Gardner (1993). Richards (2003) states that creative arts provide children with the opportunities for hands-on learning as they experience arts media and subject matter. Not all children learn in the same way or at the same rate. The arts help pupils to learn in their own way and at their own pace developing their intelligences (Gardner, 1993). Through participation in arts learning activities, pupil learners may be more engaged due to the hands-on nature of arts learning combined with the intrinsic motivation of the creative arts.Hosack (2006) conducted a study on the effects of hands-on instructional strategies on fourth grade pupils' attitudes and performance in number work in Florida. He found that the use of hands-on instructional strategy

decreased pupils' number work anxiety, pupils number work attitude improved using hands-on instructional strategy and improve the performance of pupils.

In a study, Harloff, (2011) worked on the impact of integrated arts instruction on student achievement of fourth grade urban students in English Language Arts and Mathematics in New York State. This study is a quantitative study of the impact of arts integration on the academic achievement in English language arts and mathematics of urban fourth-grade students. The data were the results of a federally funded Arts Education Model Development and Dissemination (AEMDD) grant project from 2006-2009 implemented in a large urban school district. This secondary analysis used the data from 2009, the third and final year of the AEMDD study. The analysis used the New York State ELA and mathematics test scores of fourth graders as the measure to determine if arts integration had an effect on student achievement in these two content areas. Additionally, this analysis was conducted to determine which art form, music, visual art, theater, or dance had the greatest impact. Data were analyzed using SPSS 16.0. The ANOVA results indicate that integrated arts instruction has a positive impact on student achievement in ELA and mathematics at grade four. The Pairwise Comparison with the Bonferroni Correction was used to determine the effect of the specific art form used as the intervention to determine which of the arts forms had the greatest effect on fourth grade student achievement in ELA and mathematics. It was determined that visual art had a significant effect on the fourth-grade students' performance in mathematics and that music had a significant effect on the academic achievement of urban fourth graders in ELA. Teachers, school and policy makers need to support arts integration as a means of increasing student achievement.

In another study, Anja (2015) carried out study on the benefits of fine art integration into Mathematics in primary school.The empirical part reports on the findings of a pedagogical experiment involving two different ways of teaching fifth-grade students: the control group was taught mathematics in a traditional way, while the experimental group was taught with the integration of fine art content into the mathematics lessons. At the end of the teaching periods, four mathematics tests were administered in order to determine the difference in knowledge between the control group and the experimental group. The results of the study confirmed the hypotheses, as we found positive effects of fine art integration into mathematics, with the experimental group achieving higher marks in the mathematics tests than the control group.

Statement of the Problem

In spite of diversity in the methods currently use in teaching mathematical skills at the pre-primary level of education in Nigeria, evidence abound that a lot of pupils are disabled in Mathematics as they perceived mathematics as difficult, abstract, unattractive and not easily understood. Observation has shown that most pupils have deficit in the acquisition of basic mathematical skills, even till the end of their primary level of education. However, the frequent use of traditional method of instruction (talk and chalk), regardless of modest achievement made, has not been able to mitigate against the problem of low achievement and poor attitude towards mathematics. Traditional method of instruction is largely teacher-centred and as a result emphasizes competition, repetition and drill. The poor performance of pupils in our various public examinations has been traced to poor teaching methodology where the teachers often focus on what is taught and not on the learners. It is on this premise that the researcher decided to see if alternative method of instruction that is creative arts instruction experience could help pupils acquire mathematical skills in Uyo Local Government Area.

Purpose of the Study

Generally, this study is to examine the effect of creative arts instruction on mathematical skills acquisition of preschoolers in Uyo Local Government Area. Specifically, the study intends to:

1. Determine the difference in pupils' ability to count numbers when taught usingcreative arts instruction and those taught using conventional method of instruction.
2. Determine the difference in pupils' ability to identify shapes when taught usingcreative arts instruction and those taught using conventional method of instruction.
3. Determine the difference in pupils' ability to compare quantity when taught usingcreative arts instruction and those taught using conventional method of instruction.

Research Questions

The following research questions guided the study:

1. What is the difference in pupils' ability to count numbers when taught using creative arts instruction and those taught using conventional method of instruction?
2. What is the difference in pupils' ability to identify shapes when taught using creative arts instruction and those taught using conventional method of instruction?
3. What is the difference in pupils' ability to compare quantity when taught using creative arts instruction and those taught using conventional method of instruction?

Hypotheses

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

H01: There is no significant difference in pupils' ability to count numbers when taught using creative arts instruction and those taught using conventional method of instruction.

H02: There is no significant difference in pupils' ability to identify shapes when taught using creative arts instruction and those taught using conventional method of instruction.

H03: There is no significant difference in pupils' ability to compare quantity when taught using creative arts instruction and those taught using conventional method of instruction.

Research Method

The study adopted the quasi-experimental research design. Specifically, the study was non-randomized pretest, post-test control group design. The design was chosen because intact classes were used instead of randomly composed samples. The study was conducted in Uyo Local Government Area of Akwa Ibom State. The population of the study consisted 5,723 ECC I pupils in the 49 public primary schools. A multi-stage sampling technique was employed. Firstly, a purposive sampling technique was employed to sample Uyo Local Government Area (LGA) since it was the LGA that has the highest number of co-educational schools in the state. A simple randomsampling technique was used to select four schools and intact classes of the four coeducational schools were used. Two of the schools were designated experimental and control groups respectively. A total of 92 ECC I pupils formed the sample for the study. The only instrument used for data collection was Number Work AchievementTest (NWAT). TheNWAT consisted of five (5)items developed by the researchers on the units used in the study. The instrument was face and content validated by experts in Measurement and Evaluation by adhering to the table of specification in the final selection of NWAT items. A reliability co-efficient of 0.75 was established using Kuder Richardson Formula 21.Two Lesson plans on creative artsand conventional method were prepared by the researcher on Number Work syllabus. The main treatment for the study was teaching using the conventional and creative arts

method and it lasted for four weeks. The experimental group was taught using the creative arts method while the control group was taught the same units using the conventional method.

In using this method, the regular class teacher delivered the pre-planned lesson to the pupils with or without the use of instructional aids. The regular class teachers in the selected schools were used for the study. The researchertrained the class teachers on how to use the validated instructional guides. Each teacher was given copies of validated lesson plans. The Number Work Achievement Test (NWAT) was administered as a pretest and the scores noted before treatment commenced.Immediately after the treatment, the Number Work Achievement Test (NWAT) was re-administered as a posttest to the pupils and their scores noted. Research questions were answered using mean and standard deviation while the null hypotheses were tested at $p < .05$ probability level using analysis of covariance (ANCOVA). Pretest achievement scores were used as covariates.

Results

Research Question One

What is the difference in pupils' ability to count numbers when taught using creative arts instruction and those taught using conventional method of instruction?

Table 1: Pretest- Posttest and mean difference in pupils' ability to count numbers when taught using creative arts instruction and those taught using conventional method of instruction

Group		Pre-test		Post-test		
	N	$\bar{x}$	SD	$\bar{x}$	SD	Mean difference
Creative Arts Instruction	49	1.46	1.40	6.08	1.73	4.62
Conventional Method of Instruction	43	1.35	1.42	2.05	1.41	0.70

The result in Table 1 shows the difference in pupils' ability to count numbers when taught using creative arts instruction and those taught using conventional method of instruction. The result shows that the pretest ability to count numbers of pupils exposed to creative arts instruction (experimental group) was 1.46 with a standard deviation of 1.40 and a posttest mean of 6.08 with a standard deviation of 1.73. The mean difference for pupils exposed to the experimental group was 4.62. On the other hand, the pretest ability to count numbers of pupils exposed toconventional method of instruction (control group) was 1.35 with a standard deviation of 1.42 and a posttest mean of 2.05 with a standard deviation of 1.41. The mean difference for pupils exposed to conventional method of instruction was 0.70. From this result, it can be concluded that pupils exposed to creative arts instruction (experimental group) had higher ability to count numbers than conventional method of instruction. This implies that the creative arts instruction seems effective in enhancing pupils' ability to count numbers.

Research Question Two

What is the difference in pupils' ability to identify shapes when taught using creative arts instruction and those taught using conventional method of instruction?

Table 2: Pretest- Posttest and mean difference in pupils' ability to identify shapes when taught using creative arts instruction and those taught using conventional method of instruction

Group		Pre-test		Post-test		
	N	$\bar{x}$	SD	$\bar{x}$	SD	Mean difference
Creative Arts Instruction	49	1.92	1.47	6.41	1.77	4.49
Conventional Method of Instruction	43	1.77	1.25	3.16	2.39	1.39

The result in Table 2 shows the difference in pupils' ability to identify shapes when taught using creative arts instruction and those taught using conventional method of instruction. The result shows that the pretest ability to identify shapes of pupils exposed to creative arts instruction (experimental group) was 1.92 with a standard deviation of 1.47 and a posttest mean of 6.41 with a standard deviation of 1.77. The mean difference for pupils exposed to the experimental group was 4.49. On the other hand, the pretest ability to identify shapes of pupils exposed to conventional method of instruction (control group) was 1.77 with a standard deviation of 1.25 and a posttest mean of 3.16 with a standard deviation of 2.39. The mean difference for pupils exposed to conventional method of instruction was 1.39. From this result, it can be concluded that pupils exposed to creative arts instruction (experimental group) had higher

ability to identify shapes than conventional method of instruction. This implies that the creative arts instruction seems effective in enhancing pupils' ability to identify shapes.

Research Question Three

What is the difference in pupils' ability to compare quantity when taught using creative arts instruction and those taught using conventional method of instruction?

Table 3: Pretest- Posttest and mean difference in pupils' ability to compare quantity when taught using creative arts instruction and those taught using conventional method of instruction

Group		Pre-test		Post-test		
	N	$\bar{x}$	SD	$\bar{x}$	SD	Mean difference
Creative Arts Instruction	49	2.00	1.77	6.77	1.81	4.77
Conventional Method of Instruction	43	1.95	1.66	3.62	2.62	1.67

The result in Table 3 shows the difference in pupils' ability to compare quantity when taught using creative arts instruction and those taught using conventional method of instruction. The result shows that the pretest ability to compare quantity of pupils exposed to creative arts instruction (experimental group) was 2.00 with a standard deviation of 1.77 and a posttest mean of 6.77 with a standard deviation of 1.81. The mean difference for pupils exposed to the experimental group was 4.77. On the other hand, the pretest ability to compare quantity of pupils exposed to conventional method of instruction (control group) was 1.95 with a standard deviation of 1.66 and a posttest mean of 3.62 with a standard deviation of 2.62. The mean difference for pupils exposed to conventional method of instruction was 1.67. From this result, it can be concluded that pupils exposed to creative arts instruction (experimental group) had higher ability to compare quantity than conventional method of instruction. This implies that the creative arts instruction seems effective in enhancing pupils' ability to compare quantity.

Hypotheses Testing

Hypothesis One

There is no significant difference in pupils' ability to count numbers when taught using creative arts instruction and those taught using conventional method of instruction.

Table 5: Analysis of Covariance (ANCOVA) of the significant difference inpupils' ability to count numbers when taught using creative arts instruction and those taught using conventional method of instruction

Source	Type III Sum of Squares	df	Mean Square	F_{-cal}	P-Value
Corrected Model	373.623a	2	186.812	73.290	.000
Intercept	719.747	1	719.747	282.372	.000
Pretest	.725	1	.725	.285	.595
Methods	370.799	1	370.799	145.472	.000
Error	226.855	89	2.549		
Total	2220.000	92			
Corrected Total	600.478	91			

a R Squared = .622 (Adjusted R Squared = .614)

The result in Table 5 shows that an F-ratio of 145.472 with an associated probability value of 0.000 was obtained with regards to the mean difference in pupils' ability to count numbers when taught using creative arts instruction and those taught using conventional method of instruction. Since the associated probability of 0.000 was less than 0.05, the null hypothesis one which states that there is no significant difference in pupils' ability to count numbers when taught using creative arts instruction and those taught using conventional method of instruction was rejected. This implies that there is a significant difference in pupils' ability to count numbers when taught using creative arts instruction and those taught using conventional method of instruction

Hypothesis Two

There is no significant difference in pupils' ability to identify shapes when taught using creative arts instruction and those taught using conventional method of instruction.

Table 6: Analysis of Covariance (ANCOVA) of the significant difference in pupils' ability to identify shapes when taught using creative arts instruction and those taught using conventional method of instruction

Source	Type III Sum of Squares	df	Mean Square	F_{-cal}	P-Value
Corrected Model	257.966a	2	128.983	30.454	.000
Intercept	571.157	1	571.157	134.855	.000
Pretest	16.751	1	16.751	3.955 .	050
Methods	233.492	1	233.492	55.129	.000
Error	376.947	89	4.235		
Total	2836.000	92			
Corrected Total	634.913	91			

a R Squared = .406 (Adjusted R Squared = .393)

The result in Table 6 shows that an F-ratio of 55.129 with an associated probability value of 0.000 was obtained with regards to the mean difference in pupils' ability to identify shapes when taught using creative arts instruction and those taught using conventional method of instruction. Since the associated probability of 0.000 was less than 0.05, the null hypothesis one which states that there is no significant difference in pupils' ability to identify shapes when taught using creative arts instruction and those taught using conventional method of instruction was rejected. This implies that there is a significant difference in pupils' ability to identify shapes when taught using creative arts instruction and those taught using conventional method of instruction

Hypothesis Three

There is no significant difference in pupils' ability to compare quantity when taught using creative arts instruction and those taught using conventional method of instruction.

Table 7: Analysis of Covariance (ANCOVA) of the significant difference inpupils' ability to compare quantity when taught using creative arts instruction and those taught using conventional method of instruction

Source	Type III Sum of Squares	df	Mean Square	F_{-cal}	P-Value
Corrected Model	232.653a	2	116.327	23.380	.000
Intercept	946.159	1	946.159	190.161	.000
Pretest	5.752	1	5.752	1.156	.285
Methods	225.878	1	225.878	45.397	.000

Error	442.825	89	4.976
Total	3264.000	92	
Corrected Total	675.478	91	

a R Squared = .344 (Adjusted R Squared = .330)

The result in Table 7 shows that an F-ratio of 45.397 with an associated probability value of 0.000 was obtained with regards to the mean difference in pupils' ability to compare quantity when taught using creative arts instruction and those taught using conventional method of instruction. Since the associated probability of 0.000 was less than 0.05, the null hypothesis one which states that there is no significant difference in pupils' ability to compare quantity when taught using creative arts instruction and those taught using conventional method of instruction was rejected. This implies that there is a significant difference in pupils' ability to compare quantity when taught using creative arts instruction and those taught using conventional method of instruction

Discussion of Findings

Hypothesis one focused on finding out if creative arts instruction has any effect on pupils' ability to count numbers. It was found that significant difference exists between those exposed to creative arts instruction and those exposed to conventional method of instruction. This finding is in agreement with the work ofHosack (2006) conducted a study on the effects of hands-on instructional strategies on fourth grade pupils' attitudes and performance in number work in Florida. He found that the use of hands-on instructional strategy decreased pupils' number work anxiety, pupils number work attitude improved using hands-on instructional strategy and improve the performance of pupils. Richards (2003) states that creative arts provide children with the opportunities for hands-on learning as they experience arts media and subject matter. Not all children learn in the same way or at the same rate.

In the same vein hypothesis two indicated a significant difference in pupils' ability to identify shapes. This finding is in line with the findings of Harloff, (2011) who worked on the impact of integrated arts instruction on student achievement of fourth grade urban students in English Language Arts and Mathematics and found that visual art had a significant effect on the fourth-grade students' performance in mathematics and that music had a significant effect on the academic achievement. Moreover, hypothesis three also showed significant difference in pupils' ability to compare quantity. These findings are in support of Anja (2015) who carried out study on the benefits of fine art integration into Mathematics in primary school. The results of his study confirmed positive effects of fine art integration into mathematics, with the experimental group achieving higher marks in the mathematics tests than the control group.

Conclusion

Creative arts instruction is one means to increase academic achievement of pupils as well as engage them in the learning of the arts. The cost of implementing an arts integration model to increase pupils' achievement is considerably less than many of the commercial remediation programmes. Additionally, when teachers learn how to integrate the arts they are increasing their pedagogical skill which will be of benefit to them throughout their career.

Recommendations

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

1. Teachers should practically incorporate arts integration model when teaching mathematics to increase pupils' achievement and develop pupils' artisan skill of creativity.

2. Pupils should be guided to apply the creative skills in mathematics to solve real life problems.
3. School teachers, administrators and policy makers need to ensure that the creative arts are not lost. The impact of arts integration is relatively inexpensive when compared to the cost to society of low academic achievement.
4. Federal and State level policy makers need to lead the way in ensuring that the creative arts hold a prominent place in the education of our children.

References

Anja, B. (2015). The benefits of fine art integration into mathematics in primary school. *Center for Educational Policy Studies Journal,* 5 (3):11-32

April, A. (2001). Toward a finer description of the connection between arts education and student achievement. *Arts Education Policy Review*, *102* (5), 25-26.

Ayodele, C.S. (2010). Comparative of standard of continuous assessment in secondary schools in Nigeria. An unpublished Ph.D Dissertation, University of Ado –Ekiti. Nigeria

Brooks, M. P. (2010)."Are individual differences in numeracy unique from general mental ability? A closer look at a common measure of numeracy". Individual Differences Research. 4. (8): 257–265

Brown, E. D., Benedett, B., and Armistad, M. E. (2010). Arts enrichment and school readiness for children at risk. Early Childhood Research Quarterly, 25, 112-124.

Brown, S. (2007). An arts-integrated approach for elementary level students. Childhood Education. Olney: Spring 2007. 83, (3) 172-175.

Catterall. N. (2002). The arts and the transfer of learning. In R. J. Deasy (Ed.). Critical links: Learning in the arts and student academic and social development, 162-168. Retrieved December 6, 2018, from http://www.gpo.gov/fdsys/pkg/ERICED466413/pdf/ERIC-ED466413.pdf

Ekaete, E.O. (2004). Early childhood education: Content and scope. In Q.I. Obinaju, (Eds). *Early Childhood Education: Theory and Practice*. Calabar: BON Universal, ltd, 7-26.

Federal Republic of Nigeria. (2013). National policy on education. Abuja: NERDC Press.

Finch, A. (2004). Poll shows public support for arts in schools. *Teaching Art Journal*, *2*, 50-55.

Fowler, C. (1996). Strong arts, strong schools: The promising potential and shortsighted disregard of the arts in American schooling. New York: Oxford University Press.

Gardner, H. (1993). Multiple intelligences: The theory in practice. New York: Basic Books of Harper Collins

Goldsmith, S. (2003). The liberal arts and school improvement. Journal of Education, 184, 25-36.

Griffin, N., and Miyoshi, J. (2009). Third year report: Evaluation of the Artful Learning Program. Los Angeles: National Center for Research on Evaluation, Standards, and Student Testing; Center for the Study of Evaluation

Hallam, J., Gupta, M., and Lee, H. (2008). An exploration of primary school teachers' understanding of art and the place of art in the primary school curriculum. Curriculum Journal, 19(4), 269-281

Harloff, D. F. (2011). The impact of integrated arts instruction on student achievement of fourth grade urban students in English Language Arts and Mathematics. Education Doctoral of St. John Fisher College, p.104.

Morrison, U. I., Elekwa, J. E., and Nyorere, O. I. (2013). Investing in teacher education for sustainable development in a global context: the Nigerian experience. *Journal of Educational Studies and Management;* 1 (2) 118-129.

Mulligan, J., and Mitchelmore, M. (2009). Awareness of pattern and structure in early mathematical development. *Mathematics Education Research Journal, 21*(2), 33–49.

Obanya, P. (2013). *Education for all equals all our children learning*. A lead paper presented at the 10th Annual Conference of Primary and Tertiary Teacher Education Association of Nigeria (PATTEAN) on 8th May, 2013 at Federal College of Education Asaba.

Obinaju, Q. I. (2004). *Theories of early childhood education: Theory and practice.* Calabar: Bon University Ltd.

Rabkin, N and Redmond, R. (2004). Putting the arts in the picture: Reframing education in the 21st century (pp. 41-80). Chicago, IL: Columbia College Chicago.

Richards, A.G. (2003). Arts and academic achievement in reading: Functions and implications. *Art Education*, *56*, 19-23.

Sarama, J, and Clements D. H. (2009). Early childhood mathematics education research. *Learning trajectories for young children*, 2(5):12-21

Seo, Kyoung-Hye, and Herbert P. Ginsburg. 2004. What is developmentally appropriate in early childhood mathematics education? In *Engaging young children inmathematics: Standards for early childhood mathematics education,* ed. Douglas H. Clements, Julie Sarama, and Ann-Marie DiBiase, 91–104.

Silverstein L. B., and Layne S. (2010). Defining arts integration. Retrieved 15.09.2018 from http://www.kenndy-center.org/education/partners/defimimg_arts_integration.pdf