

LOCAL GAMES AND THE DEVELOPMENT OF NUMERACY SKILLS AMONG PRESCHOOL CHILDREN IN PUBLIC EARLY CHILDHOOD EDUCATION CENTRES IN RIVERS STATE, NIGERIA.

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Abstract

The study examined the relationship between local games and the development of numeracy skills among preschool children in public early childhood education centres in Rivers State. Two purpose and two null hypotheses guided the study. The study employed the correlational research design. The population of the study was 5,407 nursery three children out of which 270 respondents were sampled using stratified and simple random sampling technique. The researchers-designed observation inventory was used for data collection which has a reliability index of 0.75 using crumbanch alpha. The statistical tool used for data analyses was Pearson product moment correlation coefficient. The findings revealed that, the use of "counting finger games" significantly relate to the development of numeracy skills among preschool children in public early childhood education centres in Rivers State; there is a significant relationship between the use of "water games" and the development of numeracy skills among preschool children in public early childhood education centres in Rivers State. Based on the findings of the study, a conclusion was made which state that, the commonest activities that enhance the acquisition of numeracy skills are various types of local games which enhance various types of numeracy skills development, such as counting finger games which enhance counting numbers skill and water games that impact measurement skills. Recommendations were made, among which include that caregivers should employ the use of educational local games in the early childhood education classroom to help preschoolers develop numeracy skills in the classroom.

Key words: Local games, counting finger game, water game, numeracy skills, preschoolers.

Introduction

There are several ways to use numeracy skills in everyday life. Numeracy skills for toddlers who are about to join primary school include learning to count, recognize numbers, shapes, patterns, colors, measuring, comparing and manipulating quantities, and more. As a result, they have been labeled as indicators of academic achievement in children at their early age and various ways in which the development of numeracy abilities at school-leaving age influences a person's future job prospects as well as their ability to compete for jobs in today's competitive labor market (Jacinta & Rotich, 2015).

Using an appropriate learning technique or approach,

parents and educators may help to ensure that children receive the right direction and training they need to succeed in life. Early childhood education has become increasingly important in the development of children's mathematical skills, as a result, Problem-solving and critical thinking are integral to the development of numeracy abilities, and this necessitates engaging learners in hands-on activities and utilizing cutting-edge teaching methods from an early age. Were we to take a look at how numeracy is taught and learned in most public early childhood education centres today? The researcher find out that caregivers were relying more on listening and looking as their primary instructional tactics. No matter how hard you try, it's impossible to get kids to study at their

own pace. Passive learning occurs as a result of caregivers not allowing the children to engage in the learning process.

The researcher also saw a regulated learning technique placed on learners' that relied too much on standard textbook issues, which did nothing to foster learners' ability to solve problems creatively or critically, rather of allowing children to think for themselves and come up with original solutions, we force them to follow a predetermined path. As a rule, learners are not allowed to connect with their peers in the classroom since it is deemed inappropriate. Assumption is that, it is a distraction. The upshot is that, learning at the centres is boring, passive and dependent. In contrast, the activities and conversations of the carers keep the youngsters quiet, causing them to get bored and distracted. Many early childhood education centres are now teaching fundamental numeracy skills like counting and manipulating numbers instead of focusing on or strengthening these abilities. This has led to the current scenario in most public early childhood education centres. Finally, youngsters cannot remember what they learned since they cannot remember any of the actions that occurred throughout their education. Even now, the value of strengthening one's numeracy abilities from an early age is undeniable. According to this, it is important to understand how youngsters learn to read and write.

The NERDC (National Educational Research Development Council, 2007) recommends that early childhood education should be child-centered, enjoyable, and flexible so that each child may learn in his or her own time frame. Rivers State's public early childhood education institutions, on the other hand, appear to be in direct conflict with best practices in this area. The development of fundamental numeracy abilities is hampered by the use of rote learning methods and the absence of appropriate resources and creative tactics. Many preschoolers, according to the study, acquire a phobia of numeracy abilities and other associated skills throughout their time there. In order to make the teaching/learning process appealing, engaging, intriguing, motivating, and adaptive to individual variations, caregivers needed to implement creative teaching tactics early and preventative measures.

Children learn best through exploration, play,

interactions, and their own experiences, as recognized by some educators, and Nigeria's Federal Government has prioritized early childhood education in the country's National Policy on Education since 1977 and 1982, 2004, 2006, 2008, and 2013 by placing emphasis on teaching methods that children at this level should be taught through play and play activities. The need of developing proper ways to assist youngsters learns numeracy through local games has become a major topic of discussion. Play is a favorite activity for most youngsters. They learn a lot about themselves and the world around them via the experiences they have while playing video games. In this way, Dewey's notion of experience learning indirectly develops critical thinking and problem-solving abilities.

Playing is a great way for children to learn and remember what they have done. A great technique to attract youngsters to participate actively in learning would be to play local games incorporating numbers sense, shapes, and measures. This would help them develop an interest in mastering the know-how of obtaining numeracy abilities in early infancy. However, as Bruner, (1966) points out, this will inspire learners to take an active role in their own education rather than simply being passive recipients of information. Observations by the researcher show that while children are playing games, they like talking about the game elements and how they relate to things like numbers, colors, forms, and sizes. They inquired about the items they observed in order to learn more about them. As they play, they converse and explore, which helps them improve their mathematical abilities, such as counting, recognizing shapes and colors, etc. Since the caregiver's job in this scenario was to provide an atmosphere where learners may engage in meaningful learning through games activities, it was clear that the caregiver's function was to harness children's numerical cognitive growth through this instructional delivery technique, to find out if there is a connection between gaming and improving numeracy abilities, the researcher have to dig further to see how numeracy abilities may be honed through the use of local games that encourage active engagement by youngsters.

Local games like any other activity children love to engage in would captivate their attention, interest and offer them a very good opportunity to learn and retain better than when they are thought with conventional

approach. Apart from playing the local games, the researcher observed that children in order to build interest and mastery in numeracy require enough time to engage in playful learning activities. Based on this observation, the researchers were persuaded to come up with the idea to in-cooperate local games such as counting finger game and water game in teaching/learning of numeracy skills by preschoolers in public preschool centres in Rivers state.

Playing local games like "Counting Fingers" requires a variety of math abilities, including counting, cardinality, subtilizing, and even merging and dismantling sets of digits. The finger game could be played by the caregiver along with the youngsters. To do this, the caregiver hides her hands behind her back, reveals them, and asks the children to count the finger she shows them. Adding and subtracting a number that is less than or more than ten with the help of a child's fingers, is a common number representation strategy. Learners can use the teacher's finger cards to play this local game between themselves. The number of things children have in their possession or play with can be represented by counting the fingers on their hands. When children indicate the number of toys and other play materials that they are interested in, they use their fingers to match the number of things, such as; 1 toy, 3 balls, 5 blocks, 10 red pencils and so on. In the same vein, Jay and Betenson (2019) argued that the increase in counting abilities when using finger's ability to respond to numbers is located in the same section of their brain as their ability to point and grab. In their submission, Ramani and Eason (2015), identified four problem-solving procedures utilized by youngsters, including finger counting and number visible strategy. During their examination, they observed that when children use their fingers to count, it looks interesting and more accurate than other methods of solving numerical issues.

Playing "water games" is also a popular pastime for youngsters. Playing with water is a favorite pastime for children. It's an educational game that can help children develop their numeracy abilities. As they play, the kids can pick up measuring skills like calculating the number of cups needed to hold a certain amount of water. Along the way, it taught them about such concepts as half, full, empty, and fuller, as well as less and more. The children learned about sinking and floating things while they played with a variety of water-based toys and were

introduced to concepts like "heavy, light, and counting the objects in the water." For water activities, the caregiver can supply the children with water, bowls, jogs, and cups. For example, they may be asked to use a cup to scoop water into a larger cup, or to count the number of little cups of water needed to fill a larger bowl or cup. Children learn about dimensions and sizes as a result of these activities. The water game gives children with the opportunity to practice number measurement, allowing them to use terminology like half, empty, full, less, and much to improve their numeracy abilities. Additionally, learning math applications is a lot of fun activities to enhance numeracy skills.

Games integrating numbers, shapes, measurement, and colors can help youngsters learn about numeracy concepts more effectively by engaging them in the process. The researcher, on the other hand, has noted that sometimes it is difficult to make a choice of games to boost learning of numeracy. To help learners improve their numeracy abilities, it was necessary to do extensive study. Counting finger games, Ayo games, lily pad games, water games, and building block games are some of the options. Almost all of these games include numerical meanings such as numerals and numbers of various forms, colors and sizes that assist youngsters learn and develop numeracy, problem-solving and critical thinking abilities as they are played. As a result, it appears that using these games to teach produces an engaging environment conducive to learning via doing. Play-based activities appeal to the majority of youngsters. Playing is a great way for children to learn and remember what they have done. A great method to get kids involved in their education is to play local games that use numbers, senses, shapes, and measures. This helps kids develop an interest in studying numeracy at their own speed and with ease in the early years of their lives. However, as Bruner, (1966) points out, this will inspire learners to take an active role in their own education rather than simply being passive recipients of information. As a result of this findings, the researcher was persuaded to come up with the notion of incorporating local games such as; counting finger games, water games, ayo games, lily pad leaping games, and building block games into the learning of numeracy abilities.

Children's hands-on activities, which stimulate all learning in the classroom, and enhance their interest in the subject, and then harness their recall capacity if

performed correctly, are the primary benefits of playing local games in the classroom. Using innovative approaches that are appropriate for developing these talents, Daghistani, (2011) asserted that "teaching children to acquire numeracy skills demands caregivers to plan an active role beyond the constraints of sitting and absorbing knowledge passively." "Preschool numeracy education should be child-centered, energetic, and engaging," as inferred by Dewey, (1952) who also believes that "education must impact the child's social environment and community." This study is therefore geared towards investigating the relationship between local games and the development of numeracy skills among preschool children in public early childhood education centres in Rivers State. And this could be achieved through utilization of local games.

Statement of the Problem

One of the key goals of early childhood care and education program is to help children develop their numeracy abilities before they join primary school. Early childhood education was planned out in details by the Nigerian government in its National Policy on Education, as well as the manner of learning, which was instructed to be via play. Most public pre-schools in Rivers State on the contrary, do not follow this directive. As a result, this study has a major flaw, this is because, most preschool children have developed phobia in learning numeracy skills due to the conventional method caregivers used to inculcating numeracy skills to them. The caregivers teach these skills in abstraction thereby make it hard for preschoolers to absorb and retain information given by the carers.

As a result of using the time-honored conventional technique of teaching and acquiring numeracy skills by listening and seeing, learners tend to develop hatred for everything that has to do with or incorporates numeracy applications because, some of the caregivers do not include play activities like local games that could help learners develop numeracy skills. For this reason, a study like this is conducted by the researchers to determine how local games can be used to inculcate numeracy skills in public early childhood education centres in Rivers State.

Purpose of the study:

The main aim of this study is to establish if there is

any relationship between the local games and the development of numeracy skills among preschool children in public early childhood education centres in Rivers State. Specifically, the objectives of the study are to:

1. Determine if there is any relationship between "counting finger games" and the development of numeracy skills among preschoolers in public early childhood education centres in Rivers State.
2. Investigate if a relationship exists between "water games" and the development of numeracy skill among preschool children in public early childhood education centres in Rivers State.

Hypotheses

The following null hypotheses are tested from the research questions to further guide the study at 0.5 level of significance:

- H₀₁. The use of "Counting finger games" does not significantly relate to the development of numeracy skills among preschool learners in public early childhood education centres in Rivers State.
- H₀₂. There is no significant relationship between the use of "water games" and the development of numeracy skills among preschool kids in public early childhood education centres in Rivers State.

METHODOLOGY

The study adopted correlational research design. 5,407 nursery three children found in 536 public preschool centres in Rivers State constituted the population for the study. 270 nursery three preschool children were selected as the sample size for the study using stratification and simple random techniques. The instrument for data collection was the researchers designed "Preschoolers Development of Numeracy Skills Observation Inventory" (PDNSOI). The instrument was validated by two experts in the Department of Early Childhood/ Primary Education, Ignatius Ajuru University of Education. A test-retest method was adopted in order to ensure the reliability of the instrument. The Pearson Product Moment Correlation (PPMC) was used to collate the reliability results which yielded a reliability index of 0.75. The 25-item instrument was administered to observed two hundred and seventy (270) preschool children. This was used to observe how Children could develop the skills of numeracy by using local games. Two

research assistants were trained with the caregivers in each of the centres for two weeks. After being trained, they assisted the researcher using the twenty-five prepared questions designed by the researcher to observe and score the preschoolers and gather the

scores for analyses. This exercise lasted for three months. The data were analyzed using Pearson Product Moment Correlation (PPMC) to test the hypotheses at 0.05 level of significance.

Result and findings

Hypothesis one: The use of "counting finger games" do not significantly relate to the development of numeracy skills among preschoolers in public early childhood education centres in Rivers State.

Table 1: Summary of PPMC Significant Relationship Test between counting finger games" and the development of numeracy skills

Variables	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	$\sum XY$	r_{cal}	df	r_{crit}	Decision
Counting fingers games	880	2644	4213	0.671	268	0.196	Reject Null Hypothesis
Development of Numeracy skills	1515	7359					

Significant @ .05 alpha level

Table 1 shows that the calculated value of r (0.671) is greater than the table value of r (0.196) at the 0.05 level of significance and with a df of 268; thus, the null hypothesis is rejected. That is, the use of "counting finger games" does significantly relate to the development of numeracy skills among preschoolers in public early childhood education centres in Rivers State.

Hypothesis two: There is no significant relationship between the use of "water game" and the development of Numeracy skills among preschoolers in public early childhood education centres in Rivers State.

Table 2: Summary of PPMC Significant Relationship Test between the use of "water games" and the development of numeracy skills

Variables	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	$\sum XY$	r_{cal}	df	r_{crit}	Decision
The use of "water games"	760	1926	3601	0.794	268	0.196	Reject Null Hypothesis
Development of Numeracy skills	1497	7241					

Significant @ 0.05 alpha level

The result from Table 2 shows that with a df of 268 and at a 0.05 level of significance, the critical table of r (0.196) is less than the calculated value of r (0.794). Therefore, the null hypothesis is rejected. Thus, there is a significant relationship between the use of "water games" and the development of numeracy skills among preschoolers in public early childhood education centres in Rivers State.

Discussion of findings

The summary of PPMC from table 1 on the relationship between the use of finger games and the development of numeracy skills among preschool children in public early childhood education centres in Rivers State showed that the calculated value of r (0.671) is greater than the table value of r (0.196) at 0.05 level of significance and with a df of 270, thus revealed that, the null hypothesis is rejected. This means, the use of "counting finger games" does significantly relate to the development of numeracy skills among preschoolers in public early childhood education centres in Rivers State. Preschoolers' numeracy skills are substantially linked to the usage of counting finger activities at public early childhood education centers in Rivers State. This finding is consistent with the findings of Boaler and Chen (2016) who found that using fingers as a visual learning exercise increased pupils' learning of numeracy by roughly 85% in a study they conducted. Similarly, the finding of the study corroborates the views of Soylyu et al. (2018) who argued that children's bodies, particularly their hands and fingers, play an important role in grounding and developing the brain networks that underpin numerical ability. They went on to say that one's brain growth and future cognitive development are directly impacted by one's physical activity.

The result from table 2 which shows the summary of PPMC on the relationship between water games and the development of numeracy skills in public early childhood education centres in Rivers State revealed that with a df of 270 and at a 0.05 level of significance, the critical table of r (0.196) is less than the calculated value of r (0.794). Therefore, the null hypothesis is rejected. Thus, there is a significant relationship between the use of "water games" and the

development of numeracy skills among preschoolers in public early childhood education centres in Rivers State. For preschoolers in public early childhood education centres in Rivers State, "water games" when played has a substantial impact on kids' development of numeracy abilities. The finding of this study, therefore, supports the views of Crosser (2015) who suggested that water games can enhance cognitive development and teach mathematics by providing numerous opportunities to handle items in the environment.

Conclusion

Without the prediction of a seer, numeracy skills development is important in the life of a preschooler. These skills may not be acquired at old age; it is easily acquired at the preschool stage. It is also not arguable that the preschool children cannot acquire these skills without some types of activity. The commonest activities that enhance the acquisition of these skills are local games and various types of local games enhance various types of numeracy skills development, such as counting finger games which enhances counting numbers skill and water games that impact measurement skill. Local games play significant roles in helping preschool children develop numeracy skills so as to be both productive and functional in their further educational pursuit and the larger society. Local games are natural business to the preschool children and they spend a great part of their time in playing the games.

Recommendations

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

1. The government could employ qualified and trained caregivers in the public early Childhood education centres to be able to employ the right instructional methods in teaching counting finger game to the preschool children in order to acquire the skill of counting numbers.
2. Care givers could employ the use of water games in the public early childhood education Class room to help preschoolers develop measurement skills in the classroom.

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