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AWARENESS AND UTILIZATION OF AYO-OLOPON TO ENHANCE MATHEMATICAL COMPUTATION SKILLS OF PRE-PRIMARY SCHOOL CHILDREN

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Abstract

Awareness and utilization of learning resources by caregivers and parents play a significant role in the holistic development of the child, hence efforts to make relevant stakeholders aware and utilize resources available are considered equally significant. One of the learning areas where resources are most needed is Mathematics to demystify its level of difficulties. This study thus investigated Parents' and caregivers' awareness as well as how "ayo-olopon" can be used as an instructional tool to improve pre-school children's mathematical computation skills. A descriptive survey research design was adopted and 140 participants made up of 40 caregivers and 100 parents of 5year old pre-schoolers in Ibadan, Oyo State were selected using multi-stage sampling procedure. Two self-design questionnaires were used to collect data for the study namely, Parents Awareness and Utilization of ayo-olopon with Preschoolers Questionnaires (PAU_AoPQ, r=0.74) and Caregivers Awareness and Utilization of ayo-olopon as Instructional Aid Questionnaires (CAU_AoIAQ, r=0.81). The data were analyzed using descriptive statistics as featured in Statistical Package for Social Sciences (SPSS). The findings revealed that caregivers are not aware of, and do not utilize ayo-olopon as an instructional resource to enhancemathematical computation skills among pre-primary school children. It was concluded that all educational stakeholders should embrace indigenous games especially ayo-olopon to teach pre-school children numeracy. It was recommended that teachers should be trained on the use of locally made instructional materials such as ayo-olopon to enhance mathematics computation skills among pre-primary school children.

Keywords: Mathematical skill, Pre-primary children, Instructional resources, ayo - olopon

Introduction

The phenomenon of learners' dwindling academic performance in Mathematics is worrisome as this attracts interest among parents, teachers, educators, researchers, and society at large. Mathematics status as mother subject for sciences and technology areas informed the research efforts to ensure that many learners not only find the subject interesting but also develop an interest in the learning and perform above average in it academically. But over the years, several survey research studies have kept reporting a downward trend in the performance of learners in the subject. Besides, the number of learners that enroll to study mathematics-related courses at the post-secondary school level kept reducing. There is therefore the need to intensify research studies on how to make the learning of the subject more effectively. This study is one of such efforts as it examines issues related to the use of the local and indigenous game to instil the Mathematics skill into the learners' right from the foundation level of education.

Recent empirical pieces of evidence point to the fact that despite efforts to improve academic performance in Mathematics, the effects have not been so felt in the Nigerian educational system. For instance, it was reported in Nigeria that the West Africa Examination Council performance of students in Mathematics from 1999 to 2016 is disheartening as those who had 50% and above in the subject ranged from 11.1% of students in the year 1998 to 53.8% in the year 2004 with average performance for the 26 years being 27.3% (WAEC, 2018). The study of Zalmon and Wonu (2017) corroborates this fact with findings that for the period of 26 years, that is, 1991-2017, averagely, only 27.3% of students in Nigeria obtained credit and above (A1- C6) while 72.7% had pass and below (D7-F9) in the May/June West Africa Senior Secondary Certificate Examination (WASSCE) in Mathematics. This situation could be due to lackof interest in the subject or ineffective learning right from the foundation level of education - Pre-school and primary school level (Udonsa & Udonsa, 2015). Another factor that might be attributed to poor performance in Mathematics is the inability of the teachers to inspire the learner through the use of interesting instructional resources like local games right from the early years.

Human beings live in a society that requires critical and reflective thinking in solving personal and societal problems as well as contributing meaningfully to the development of such a society. The thinking and reasoning ability of an individual lies on intellectual development right from the childhood phase. Millians (2011) and Harris (2017) agreed that computational skills are the ability to perform basic operations in Mathematics such as addition, subtraction multiplication and division quickly and accurately using mental methods.Mathematics is fundamental concepts and ideas that are structured in strands such as concepts, numeration, measurement, arithmetic, algorithmic. Mathematical computation, therefore, involves the study of quantities as expressed in numbers or symbols (Millians, 2011). The development of computation skills helps to enhance the development of the intellectual domains of the children.

Holistic development, in which intellectual development cannot be exempted could be achieved through better mathematical computation skills of individual children from the preschool years (Salami, 2016).Mathematical computation skills remain a key component of students' mathematics education because they lay the foundation for success in future mathematics learning and critical thinking skills. Millians, (2011) submits that these skills will enable the learners to easily engage in everyday life tasks such as problem-solving.

Literature has it that the African view about the child is holistic (Nsamenang, 2006), therefore, learning resources that will address whole development of the child, most especially for Mathematics, should be adopted. In Africa, most especially among the Yoruba people in Nigeria, the use of ayo-olopon (a kind of Yoruba indigenous traditional game) to develop 'the body, the mind and the spirit' of a child cannot be overlooked. Playing the game appeals to the intellectual, physical as well as socio-emotional skills of the players but the needed skill to win or demonstrate expertise in the game is intellectual. Ayo-olopon is the only indigenous game that has international reputation with its most standardized procedure (Okewande, 2017). Ayo means seeds and Opon means tray-like holder. A fusion of both words means Seeds in the tray-like holder. Ayo-olopon otherwise called an African Board Game is referred to as the game of intellectuals. It is a traditional game that is played universally notably among the Yorubas which often refer to it as 'Ayo'.

The art of playing Ayo is called *Ayo tita***.** In Yoruba indigenous setting, *ayotita* is observed in the evening after the day's work. It is often believed that only lazy men play games in the morning (Osun Defender, 2019).

Literature Review

Theoretical Background: Vygotsky's Sociocultural Cognitive Theory.

Lev Vygostky (1896-1934) is a Russian Scientist who viewed children as socio-centric being.Vygotsky's theory stresses the fundamental role of social interaction in the development of cognition and posited that community plays a central role in the process of "making meaning" to the learning objects. Children are considered to be active and construct their knowledge based on the tools provided by society. Children's minds are molded by the cultural context in which they live. Thus, these tools or cultural inventions such as language, mathematical resources such as *ayo-olopon* and strategies are used to enhance the development of memory, attention and reasoning which changes over space and time (Akpan et al., 2020).

The theory has stimulated considerable interest in the view that knowledge is situated and collaborative (Akpan et al., 2020). The view portrays that knowledge is not only from within but through the interaction with other people and objects of the culture such as games. This provide the background idea that knowledge can best be advanced through interaction with others in cooperative activities. Social interaction through cooperative dialogue with More Knowledgeable Others (MKO) is a critical way of thinking or constructing knowledge while handling particular tasks or solving problems. The MKO helps children master culturally meaningful activities which makes the communication between or among them to be part of children's knowledge construction.

As children and MKO interacts, the former internalizes elements of dialogue that shape and guide them in their thoughts, actions and acquire new skills (Obi, Cornelius-Ukpepi and Ndifon, 2019). In this context, when the teacher (MKO) play the game of ayo-olopon with the children, will create an opportunity for the children to learn from the resources as well as the MKO

Kapur (2018) observed that social construction of knowledge takes place in various ways and at different locations and this includes scaffolding, dialogue and guided participation play significant roles in constructing knowledge among children. Scaffolding is the changing level of guidance given to less knowledgeable by MKO in the process of teaching and learning (Akpan et al., 2020). As the child's knowledge increases in the process of learning a new task, less guidance is given. Guided participation is also considered as the shared endeavours between MKO and less knowledgeable children, regardless of the precise features of communication. The process is an advanced concept of scaffolding (Vera, Udodirim, Ikechukwu &Charity, 2020)

This theory is relevant to the present study as constructs of the theory were critically considered with their importance. These include parents and teachers as MKOs, the guide in the process of guided participation, scaffolding as well as ayo-olopon as a cultural tool to enhance mathematical computation skills of pre-primary school children in Ibadan Metropolis.

Piaget Cognitive Constructivism Theory

Piaget's (1936) theory of cognitive development explains how a child constructs a mental model of the world. Jean Piaget a Swiss biologist and psychologist (1896-1980) who viewed learners as active participants or constructors of knowledge. His emphasis was on the roles of the environment in the development of the mind and furthered sought for a biological explanation for the connection between the mind and the brain (Khadidja & Kelkoul, 2016). Thus, cognitive development which involves mental activities of comprehending the information and the process of acquiring, organizing, remembering and using knowledge depends basically on maturation, physical experience, social interaction, and progression towards equilibrium (Owen, 2008). The role of exploration and interaction cannot be undermined while children are constructing their knowledge.

The new experience gathered through exploration and interaction will either fits into the existing schema or knowledge as assimilation or fits into another schema if the new experience obtained is contrary to the existing one as accommodation. Each new

experience causes a momentary mental imbalance (disequilibrium) that triggers the adaptive mental processes of assimilation and accommodation. Once the new experience is assimilated and accommodated, equilibrium is restored (Estes, 2004).

Piaget proposed that though children follow the same predicted pattern of development, their rate of development differs owing to variation in biological and environmental factors (Estes, 2004). There are four stages or pattern of development with distinct features as identified which include

- Preparatory stage/Sensorimotor – (birth-2) years
- Pre-logical/ pre-operational stage – (2-7) years
- Concrete stage - (7-11) years
- Formal stage - (11-15years upward).

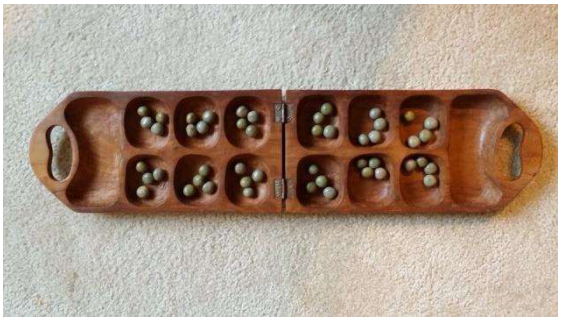
For the purpose of this study, the focus is on children at pre-logical stage especially the pre-primary school children (5-5+years). Thus, this stage can be divided into pre-conceptual (2-4) years and intuitive (4-7) years periods.

The theory is relevant to the study as it relates to age appropriateness, cognitive activities and development of children through exploration and interaction with environment and its tools like *ayo-olopon*. A*yo olopon*is an age-appropriate traditional game which requires certain mental or cognitive ability of pre-logical stage such as development of complex play skills, development of symbolic functions, irreversibility, centration, animism, realism, static reasoning among others.

How to play ayo-olopon and the skills involved.

Ayo-olopon is a game played in a designed wooden tray with twelve holes (six holes on each side), with forty-eight Ayo seeds placing 4 seeds in each hole. Though the technicalities involved in playing this traditional game is complex and varies from one person to the other owing variation in optimum utilization of cerebral properties and development. Still, it is a game with universal basic rules and guide. Two individual players take turn to play this game by dropping an *ayo* seed (1 per hole) in the holes anti-

clockwise direction. The first player starts by moving seeds from his side to the opponent's side. If the seed movement terminates in a hole (at the side of the opponent) with 2 or 3 seeds, this player picks up the seeds (as his harvests) and those in the preceding holes with 2 or 3 seeds.



Fig,1: Ayo Olopon

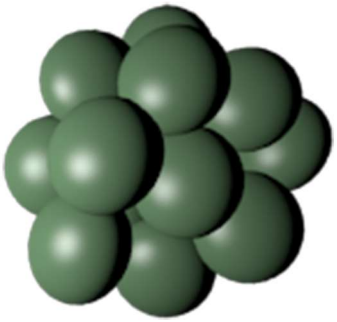


Fig. 2: Ayo seeds

Players continue in turn until the seeds are exhausted. The player with upper hand is called Ọta (the winner or professional), who must have more than 24 seeds harvested in a single game. A player is declared a *winner* only if he wins at least 2 out of three games played consecutively. There are different types of winners, winning 2 out of 3 games, winning 3 games with a draw, winning 3 games without a draw and winning 6 or 9 games without a draw. The weak or the losing player is called Ope (Yoruba), Iti (Igbo) or wandayafadi (Hausa) language. The observers comment on the flow and direction of the game which make the session interesting. The mathematical skills come into play when the player has to calculate that dropping of seeds terminates where there will be a seed or two seeds so as to bring forth harvest. More harvest determines who wins. Both gross and fine motor skills are also promoted during the process of distributing the seeds. Socio-emotional skills are promoted through taking turns to play, interacting with other player and mockery comments that go along with the game from players and the spectators.

Mathematical skills embedded in *ayo-olopon*

Playing *ayo-olopon* rests heavily on some major mathematics operations which resulted in accurate calculation. Some of these operations are counting, addition, subtraction, Matching, projection, logical thinking and others.

The first and the most important mathematical skill needed to play ayo-olopon is counting. A player must be able to count the number of seeds he has in a hole and determine where it will end when distributed in the holes anti-clock wisely by counting the holes too. This is used to determine when a distribution will bring some harvests.

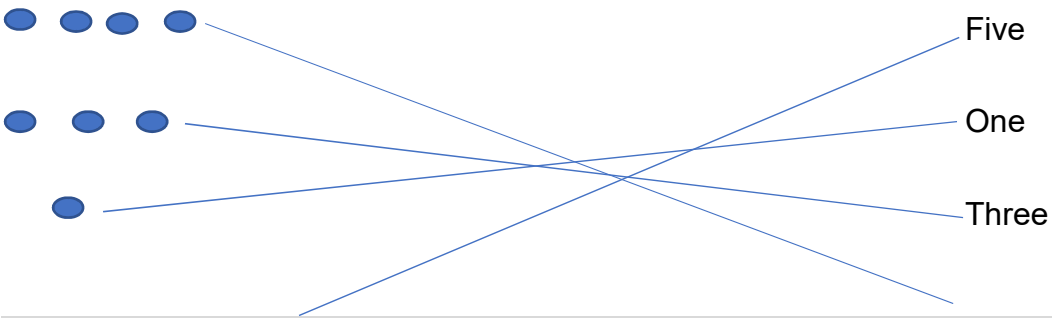
Another important basic operation required is addition operation. A player is expected to count and add the number of seeds together. An illustration is shown thus:

4	+	3	=	7
Four	+	Three	=	Seven

The subtraction basic operation skill is as follow:

6	-	1	=	5
Six	-	One	=	Five

Matching Operation:



The role of *ayo-olopon* can never be undermined in the learning and intellectual development of a preschoolers especially those that fall into the Piaget's pre-operational stage of development - age bracket of 2-7years. Ayo-olopon, being a mathematical game, requires critical thinking, and good strategy to move seeds with the utmost desire to win. The game process could improve the ability of preschoolers in the following areas:

- Rational counting
- Employ symbolic representation
- Employ pre-causal reasoning
- Do reverse order thinking
- Understand cause and effect relationship
- Develop abstractness and generality
- Increased reflection ability

In the same vein, *ayo-olopon* will enhance concrete modelling of addition for example, using manipulative to add two sets together, solving basic addition problems (for example, I have some amount of money in my pocket. If my mother gives me five naira, now I have fifteen naira all together. How much was in my pocket initially?), even distribution of seeds and other quantities among a given number of people (Cassandra et al., 2015)

Despite the relationship that exist between playing ayo-olopon and mathematics skills and knowledge, there is dearth of literature on its utilisation to expose mathematics to children in pre-primary schools. Available research studies on mathematics learning focus on the use of other forms of instructional resources but not this indigenous game. There is therefore the need to examine the level of awareness and utilisation of ayo-olopon by both parents and teachers of pre-primary school children. The paper also present a guide to the use of this indigenous game with children.

Objectives of the study

The following are the objectives of this study:

- ✓ To assess the level of awareness of caregivers and parents towards the benefits of *ayo-olopon* in enhancing mathematical computation skills among pre-primary school children.
- ✓ To assess the level of utilization of *ayo-olopon* as instructional resources to enhance mathematical computation skills.
- ✓ To provide information for caregivers, parents and other stakeholders on how *ayo-olopon* can be used toimprove pre-primary school children's mathematics computation skill.

Research questions

The following research questions were asked for the purpose of the study:

1. What is the level of awareness of caregivers towards the benefits of *ayo-olopon* in enhancing Mathematical Computation skills among pre-primary school children?
2. Do the caregivers utilize *ayo-olopon* to enhance Mathematical Computation Skills?
3. What is the level of awareness of parents towards the importance of *ayo-olopon* to enhance Mathematical Computation Skills in pre-primary school children?
4. Do the parents utilize *ayo-olopon* to enhance Mathematical Computation Skills?

Materials and Method

This study adopted a descriptive survey research design. The entire parents and caregivers of pre-primary school children in Ibadan Metropolis formed the population of the study. A multi-stage sampling procedure was adopted to select the sample of the study. At the first stage, random sampling technique was used to select four Local Governments Areas (LGAs) out of the five that made up of Ibadan Metropolis. From the selected LGAs, disproportionate stratified random sampling was used to select 10 preschools that cut across both public and privately owned schools and the pre-primary section of the selected schools were purposively selected. This gave a total of 40 pre-primary sections from 40 primary schools selected across Ibadan metropolis. Total enumeration was used to select all the 40 Class Teachers of pre-primary sections of the

selected schools and random sampling was used to select 100 parents of the children in the pre-primary sections. At the end of the selection, 140 respondents form the sample of the study.

Two research instruments namely, Parents Awareness and Utilization of A*yo-olopon* with Preschoolers Questionnaires (PAU_AoPQ) and Caregivers Awareness and Utilization of *Ayo-olopon* as Instructional Aid Questionnaires (CAU_AoIAQ) were designed and developed to collect data for this study. The two instruments were subjected to validation processes. The face, content and construct validity were ensured by university lecturers specializing in early childhood education and some experienced pre-school teachers. The reliability of the instruments was tested through field testing and Cronbach alpha techniques was employed wherein PAU_AoPQ yielded $\alpha = 0.74$ and CAU_AoIAQ yielded $\alpha = 0.81$ coefficients.

The data collected were analyzed using descriptive statistics as featured in the Statistical Package for Social Sciences (SPSS) computer software. Frequency count, percentage, mean and standard deviation were used to answer the research questions.

Results and Discussion

Research Question 1: What is the level of awareness of caregivers towards the benefits of *ayo-olopon* in enhancing mathematical computation skills among pre-primary school children?

Table 1

The level of awareness of caregivers towards the benefits of *ayo-olopon* in mathematical computation skills of pre-school children

	Caregivers' Awareness	SA	A	D	SD	Mean	S. Dev.
1.	I am aware that *ayo-olopon*helps in handling basic mathematical operations like addition and subtraction.	-	8 (20.0)	16 (40.0)	16 (40.0)	1.800	0.759
2.	I am aware that *ayo-olopon* enhances the productivity of both the caregiver and the children	-	16 (40.0)	16 (40.0)	8 (20.0)	2.200	0.758
3	I know that *ayo-olopon* increases thinking ability of children	-	16 (40.0)	24 (60.0)	-	2.400	0.496
4.	I am aware that *ayo-olopon* helps children to understand cause of an action	-	4 (10.0)	28 (70.0)	8 (20.0)	1.900	0.545
5.	I am as well aware that *ayo-olopon* helps to understand effect of an action	4 (10.0)	12 (30.0)	8 (20.0)	16 (40.0)	2.100	0.057
6.	I am aware that *ayo-olopon* can enhance reverse thinking ability of Children	-	24 (60.0)	14 (30.0)	4 (10.0)	2.500	0.679
7.	I know that Children can employ symbolic representation with the use of *ayo-olopon*e.g  Equals 2 seeds	4 (10.0)	4 (10.0)	24 (60.0)	8 (20.0)	2.100	0.841
						Weighted Average= 2.14	

Table 1 reveals that are not aware of the benefits of *ayo-olopon* to enhance mathematical computation skills among pre-school children with weighted average of 2.14. The detailed interpretation is as follows: caregivers disagree they are aware that *ayo- olopon* helps in handling basic mathematical operations like addition and subtraction (x =1.80), also caregivers' disagree they are aware that *ayo-olopon* enhances the productivity of both the caregiver and the children (x=2.20), caregivers disagree they are aware that *ayo-olopon* increases thinking ability of children (x=2.40), also caregivers strongly disagree they are aware that *ayo-olopon* helps children to understand cause of an action (x=1.90), caregivers agree they are aware that *ayo-olopon* helps to understand effect of an action (x=2.10), caregivers agree they are aware that children can reverse their decisions with *ayo-olopon* (x=2.50) and caregivers strongly agree they are aware that children can employ symbolic representation with the use of *ayo-olopon* (x=2.10).

Research Question 2: Do the caregivers utilize and allow children to use *ayo-olopon* as instructional resource to enhance mathematical computation Skills?

Table 2

The caregivers' level of utilization of *ayo-olopon* to enhance mathematical computation skills of pre-school children

S/N	ITEMS	Very Often	Often	I don't know	Not at all	MEAN	SD
8.	I play *ayoolopon* frequently with preschoolers to enhance basic mathematical operations	-	4 (10.0)	4 (10.0	32 (80.0)	1.300	0.648
9.	I use *ayoolopon* for practical demonstration of basic mathematical operations	-	-	16 (40.0)	24 (60.0)	1.400	0.496
10.	I use *ayooloponso* as to achieve the objectives of basic mathematical operations	-	-	16 (40.0)	24 (60.0)	1.400	0.496
11.	I use *ayoolopon* to assess efficiency of children's skills	-	8 (20.0)	12 (30.0)	20 (50.0)	1.700	0.791
12.	I use *ayoolopon* to enable my children develop interest in mathematical computation skills	-	4 (10.0)	12 (30.0)	24 (60.0)	1.500	0.679
13.	I use *ayoolopon* to increase attention capacity of preschoolers	-	-	8 (20.0)	32 (80.0)	1.200	0.405
						Weighted Average= 1.42	

Table 2 reveals that caregivers do not utilize *ayo-olopon* as an instructional resource to enhance effective mathematical computation skills among preschool children with the weighted average 1.42**.** The detailed interpretation is as follows: caregivers do not play

ayo-olopon frequently (x=1.30), also caregivers do not use *ayo-olopon* for practical demonstration of basic mathematical operations (x=1.40), caregivers do not use *ayo-olopon* to achieve objectives of basic mathematical operations (x=1.40), they do not use *ayo-olopon* to assess efficiency of children's skills (x=1.70), they do not use *ayo-olopon* enable children develop interest in mathematical computation skills (x=1.50), caregivers do not use *ayo-olopon* to increase attention capacity of pre-schoolers (x=1.20).

Research Question 3: What is the level of awareness of parents towards the importance of *ayo-olopon* to enhance mathematical computation skills in preschool children?

Table 3

The level of parents' awareness about the benefits of *ayo-olopon* in mathematical computation skills of pre-school children.

S/N	Parent's Awareness	SA	A	D	SD	MEAN	S.Dev
1.	I am aware that *ayo-olopon* helps in handling basic mathematical operations like addition and subtraction	15 (15.0)	35 (35.0)	25 (25.0)	20 (20.0)	2.350	1.114
2.	I know that *ayo-olopon* enhances the productivity of children	20 (20.0)	50 (50.0)	10 (10.0)	15 (15.0)	2.650	1.114
3	I am aware that *ayo-olopon* increases thinking ability of children	20 (20.0)	45 (45.0)	20 (20.0)	5 (5.0)	2.600	1.163
4.	I am aware *ayo-olopon* helps children to understand cause of an action	5 (5.0)	60 (60.0)	30 (30.0)	5 (5.0)	2.650	0.657
5.	I know that *ayo-olopon* helps to understand effect of an action	25 (25.0)	50 (50.0)	20 (20.0)	5 (5.0)	2.950	0.809
6.	I know that *ayo-olopon* increases the attention capacity of children	15 (15.0)	50 (50.0)	25 (25.0)	5 (5.0)	2.650	0.968
7.	I am aware that children can employ symbolic representation with the use of *ayo-olopon*e.g	30 (30.0)	50 (50.0)	10 (10.0)	10 (10.0)	3.000	0.899
	+ = 2						
						Weighted Average = 2.69	

Table 3 reveals that the parents are aware of the benefits of *ayo-olopon* to enhancing mathematical computation skills of pre-school children with weighted average of 2.69. The detailed interpretation is as follows: parents agree they are aware that *ayo-olopon* helps in handling basic mathematical operations like addition and subtraction (x=2.35), also they agree they are aware that *ayo-olopon* enhances the productivity of children (x=2.65), they agree that *ayo-olopon* increases thinking ability of children (x=2.60), they agree that *ayo-olopon* helps children to understand cause of an action (x=2.65), they also agree that *ayo-olopon* helps to understand effect of an action (x=2.95), they agree that *ayo-olopon* increases the attention

capacity of children (x=2.65) and parents agree that Children can employ symbolic representation with *ayo-olopon* (x=3.00).

Research Question 4: Do the parents utilize and allow children to use *ayo-olopon* as instructional resource to enhance mathematical computation skills?

Table 4

The caregivers' utilization of *ayo-olopon* to expose mathematical computation skills to pre-school children

S/N	ITEMS (Parent's utilization of *Ayo-olopon*)	Very often	Often	I don't know	Not at all	MEAN	SD
8.	I just like to play *ayo-olopon* frequently with my child(ren)	-	-	40 (40.0)	35 (35.0)	1.450	0.672
9.	I use *ayo-olopon* for practical demonstration of basic mathematical operations	-	40 (40.0)	-	55	1.550	0.744
10.	I use *ayo-olopon* to enhance eye-hand coordination	-	5 (5.0)	55 (55.0)	35 (35.0)	1.600	0.667
11.	I use *ayo-olopon* to measure the progress of my child(ren)	-	10 (10.0)	40 (40.0)	45 (45.0)	1.550	0.744
12.	I use *ayo-olopon* to enable my children develop interest in mathematical computation skills	-	5 (5.0)	60 (60.0)	30 (30.0)	1.650	0.657
13.	I allow my child to play with *ayo-olopon*	-	5 (5.0)	50 (50.0)	45 (45.0)	1.600	0.586
14.	I use *ayo-olopon* to increase attention capacity of preschool child(ren)	5 (5.0)	-	30 (30.0)	65 (65.0)	1.450	0.744
					Weighted Average = 1.55		

Table 4 reveals that parents do not utilize *ayo-olopon* as an instructional resource to enhance effective mathematical computation skills among preschool children **(x=1.55**). The detailed interpretation is as follows: parents do not play *ayo-olopon* frequently with their child(ren) (x=1.45), they do not also use *ayo-olopon* for practical demonstration of

basic mathematical operations (x=1.55), that do not use *ayo-olopon* to enhance eye-hand coordination (x=1.60), Parents do not use *ayo-olopon* to measure the progress of their children (x=1.55), they agree that children develop interest in mathematical computation skills with *ayo-olopon* (x=1.65), parents do not allow their children to play *ayo-olopon* (x=1.60), parents do not use *ayolopon* to increase attention capacity of preschool children (x=1.45).

Discussion of Findings

The findings of this study indicated that caregivers are not aware of the benefits of *ayo-olopon* as instructional resource to enhancing mathematical computation skills among preschool children. Thus, the lower the level of awareness among the caregivers could result into low level of utilization of *ayo-olopon.* This could have significant influence in teaching learning processes as well as contribute to low level of mathematical computation skills among pupils and student. The findings further established that parents are aware of the benefits of the benefits of *ayo-olopon* at a lower scale to enhance mathematical computation skills among preschool children. This could be attributed to group experience of the parents, level of exposure among others (Obidike et al., 2010).

The findings of this study as well revealed that caregivers and parents do not use *ayo-olopon* to enhance mathematical computation skills among preschool children. The lack of utilization of indigenous made instructional aids like *ayo-olopon* will limit children from developing holistically and effective learning like mathematical computation skills in culturally appropriate manner (Nyota and Mapara, 2008; Maganye, 2011; Majebi and Oduolowu, 2019). The caregivers' finding is in contrary to Okudo and Omotuyole (2013) result that showed 42.11% agreed, 46.61% strongly agreed, 5.26% disagreed, while 5.31% strongly disagreed with the use of locally made instructional materials to promote effective teaching and learning in the early years of learning of the children. However, the findings and position of Ekpo (2004) revealed that instructional materials are often used to compensate for the inadequacies of the sense organs and that they must be relevant for the realization of effective learning and the intentions of the curriculum.

Conclusion

The findings and discussion revealed that the level of awareness and utilization of *ayo-olopon* among caregivers and parents is very low and of course this is worrisome despite the multiple opportunities embedded in the game. This supports the research which shows that Nigeria is very much behind in the use tools especially indigenous tools like *ayo-olopon* in education (Obagah, 2002; Ali, 2003, and Osumah, 2003). With the present realities, *ayo-olopon*is considered to be insignificant in all aspects of Nigerian education (Obidike et al., 2010). Thus, all efforts must be channelled by all stakeholders towards increasing awareness, utilization as well as making the indigenous tool like *ayo-olopon* available in schools and at homes for teaching mathematical computation operations.

Further studies should be carried in other ethnic society to establish the significance and context appropriateness of *ayo-olopon* to enhancing mathematical computation skills among children. Also, experimental studies should be carried out to establish the significance of *ayo-olopon* to enhancing mathematical computation skills among pre-school children

Recommendations

1. Early childhood education curriculum guide should be structured to prioritize the use of locally made tools for holistic development of preschool children
2. National Policy on Education and other working papers on Early Childhood care and Development should reflect the need to have traditional art materials for accessibility of indigenous tools like *ayo-olopon*
3. Teachers should be encouraged to be using locally made instructional materials for pre-primary school children so as to develop children holistically and also to enhance effective mathematical computation skills
4. There should be training and re-training of early childhood education teachers on the utilization of locally made instructional materials for the effective teaching and learning mathematical computation skills.
5. Proprietors/head teachers should conceive the utilization of locally made instructional materials and training on how to use them as high priority activity and

thus create a good opportunity for their teachers to benefit. Thus, their efforts and contribution would likely enhance /results in the effective teaching and learning and communicative competence development in the early childhood education.

6. Parents and Caregivers should be sensitized on the advantages embedded in *ayo-olopon* for improved awareness and optimum utilization of the tool for total child.

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