

Rethinking the Role of Shona Cultural Games and Activities in the Teaching and Learning of Mathematics at ECD Level in a Selected District in Manicaland Province, Zimbabwe

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ABSTRACT

The qualitative study explored the role of Shona cultural games and activities in the teaching and learning of mathematics at ECD level in a selected district in Manicaland Province, Zimbabwe. An Interpretative Phenomenological Analysis was done to ten purposively sampled research participants. The questionnaire with qualitative questions and semi-structured in-depth interviews were used for data collection. The cultural games that participants used included arauru or pada, the play button game, Playing house (mamhuza) Tsoro or draft zairakaora, Nhodo /inota, sarurawako help learners to learn the concepts of balancing, mass and weight; observation, concentration, adding and subtraction in mathematics. Cultural activities which the respondents included making brushes/brooms using grass or reed (tsanga) pot making using clay, making fire places using mud or stones, Winnowing, to teach sets, shapes, area and direction. The study recommends that ECD caregivers should continue engaging pupils to participate in cultural games such as 'nhodo', 'pada', 'mahumbwe' and many other cultural activities that are found within their cultural context, with the norms and values of their society, which develop the holistic child. There is also need for teachers to make mathematics more relevant by linking it with activities familiar to the students so that they become motivated to do the subject. Teachers need to move away from the chalk and talk way of teaching mathematics and try to involve the learners as much as possible, informed about the research results, which show the existence of mathematical ideas in different cultures.

Keywords: Shona cultural games, tsoro, zairakaora, nhodo

INTRODUCTION

Cultural influences on childhood development can be amplified through the elementary and high mental notations of Vygotsky (Bruce, 2018). Cognitivists such as Vygotsky, Rogoff and Piaget have stated that children learn best through play and fun in the context where they have concrete objects (Biehler & Snowman, 2017). In early childhood development (ECD) settings, children are believed to have a short concentration span hence they need interesting activities to keep their concentration high and remain motivated. Motivation is important in getting children to learn once their attention has been captured (Vanugopalan, 2007). Caregivers should therefore, enhance motivation through the use of cultural games. Traditional cultural games are activities that have rules and regulations to be followed according to the socially accepted behaviour, attitudes and beliefs of that particular study.

Games are major components of childhood play. Thus, games are the most suitable activity for the purpose of stimulus variation in the classroom. Froebel in Barker (1992, 56) supports the idea when he says "it is through play that the child first represents the world to himself." The games give children a sense of involvement and fulfilment. This is because children would be striving to have their 'turn' wanting to stay in

the game, to be the first or winner, and to gain points. According to Barker (1992), the pre-exercise theory states that children play in order to practice and perfect their instincts for survival. Therefore, play is a means of teaching children the skills of adult work and their teacher should endeavor to direct the children's inclinations and pleasures by the help of entertainment, to achieve their final aim in life.

Bruce (2018) says that since the 1920's Vygotsky's theory has not been explained as much as his view that children participate more in their culture and learn what is important for them to know through social relationships with others, especially adults. Vygotsky (1978; 101) cited in Bruce (2018) sees play as creating a zone of proximal development in which children operate at their highest level pre-school development. The children move forward essentially through play activities (Vygotsky, 1978:102-3).

Froebel in Jaini and Kapoor (1990:109) says "The child expresses himself best in play and at the same time learns more." It is through cultural games that the child discloses his real life and clearly initiates his future life and interests. Hence the research wants to find out the role of Shona cultural games that children express themselves. This research also wants to establish the role of Shona games identified in the learning and teaching of mathematics in ECD B classes in Kariba District.

Traditional Shona cultural games are methodologies that can be used in the teaching and learning of ECD B classes to develop the physical, intellectual, emotion and social aspects of the child. There are different teaching methodologies employed to develop the holistic child. In other words, the caregiver of ECD today is confronted with an immense variety of possible methods and techniques which he or she might employ in his or her work. Sutton and Hayson (1994) say that these methodologies are demonstrations, projects, case study, drama, resource methods, problem solving, games, field trips and experimentation. ECD syllabus (2015-2022) supports the methodologies in addition to other methodologies such as role-play, computers, video games and televisions. Therefore, the research wants to find out if these traditional methods, particularly cultural games, are still being used in the teaching and learning situations.

Traditional cultural games in ECD B classes' settings promote physical development, moral, and intellectual values as well as team work. This is found when children work in groups. Children tend to share ideas freely and have the aim of being the winner in group activities. In support, Montessori cited in Morrison (2014) says that many classroom games provide physical activities which are essential to desire growth and development. Others, though having little exercise value, help to achieve strain and tension. This means play offers relaxation from work. Team spirit is really promoted when games are implemented at ECD settings. Hence, the researcher wants to find out if Shona traditional cultural games are played in ECD B class settings in Kariba District and are the keys for promoting team spirit and relaxation from work.

According to Linghard and Dhlamini (1999) ECD Class B requires much more student participation and less authoritarian management by the caregiver, whom is now a facilitator. To put it in other words, caregivers should encourage children to interact both with the materials with each other as much as possible. In game situations whereby children are divided in to smaller groups, the caregiver finds it easy to identify those individual problems through observing children playing the games. Therefore, the caregiver would help them so that they would not have difficulties in solving problems. Through this, the caregiver gets an opportunity to establish a good rapport with pupils as barriers tend to disappear easier. Bruner (1990) cited in Morrison (2014) argues that culture shapes cognitive development of children in the teaching and learning of ECD B classes in Kariba District.

William and Somerwill (2013) say that games help to create a confident and secure atmosphere in the classroom. Thus, traditional cultural games bring isolated children into social interaction with others. Cultural games also encourage children to work together and to participate with others as they are. This research wants to find out which cultural games help to create a confident and secure atmosphere in the teaching and learning of ECD B classes in Kariba District.

Traditional cultural games can be indoor or outdoor games such as 'tsoro', 'nhodo', and 'pada'. These games develop skills in children such as fine motor skills which are important when writing, in shaping numbers and drawing. Cultural games can be effectively used for play and can be used to teach reading. The use of play in education has its origin in the belief that all children want to play and that meaningful learning will occur at the same time. Gordon and Brown (2014:369) assert that, "play is the cornerstone of learning." Hence, the research wants to find out whether traditional games are the cornerstone of learning in the development of the holistic child in the teaching and learning of ECD B classes in Kariba District.

The researcher has realized that children learn differently if a variety of teaching methods such as the use of cultural games were employed. Games could stimulate children's desire to learn and the children might benefit and learn better through games representing the names and values of the society. The research there wants to find out the nature and role of traditional cultural games in the teaching and learning of ECD B classes in Kariba District.

Experience and observation as a classroom practitioner has shown that there was little knowledge among the caregivers of the importance of use of cultural games, especially for the untrained caregivers and inexperienced caregivers recently from the college. Traditional cultural games appear not to be used effectively in the learning and teaching of ECD B classes for them to develop the holistic child. It would look like traditional cultural games are being eroded, especially now that the new games have emerged from Western culture and those on toy cellular phones, computers, and video and television games.

Aim

To rethink the role of cultural games and activities in teaching mathematics in ECD B learners in a selected district in Zimbabwe.

Research questions:

1. What specific cultural games and activities can be effectively utilised by ECD B teachers in teaching mathematics?
2. What are the views of teachers on the use of games and cultural activities in the teaching of mathematics at ECD B level?

METHODS

The study is located in the qualitative research paradigm. In order to gather data from this phenomenological study, the use of IPA (Smith & Osborn, 2015) was done by means of a questionnaire with qualitative questions, with the aim of producing rich and meaningful data about a small number of people. IPA focuses on exploring how participants make sense of their personal and social world. Interpretative phenomenological analysis (IPA) is a qualitative approach which aims to provide detailed examinations of personal lived experience (Smith & Osborn, 2015). This phenomenological study explored personal experiences of Zimbabwean school teachers with regard to the teaching and learning of mathematics using games and cultural activities by getting close to the participants' personal world through a process of interpretative activity. This allows the researchers to examine how participants perceive the effectiveness of games and cultural activities.

Sample and sampling strategy

In an Interpretative Phenomenological Analysis approach, in which the study is predicated, there is use of small samples and the researchers purposively sampled 4 male and 6 female participants as research subjects. However, the researchers were sacrificing breadth for depth (Smith & Osborne, 2008) as espoused

by IPA.

Data collection

The researchers made use of a questionnaire with qualitative questions and semi-structured in-depth interviews with the participants. The form of interviewing used allowed the researchers and participants to engage in a dialogue whereby initial questions are modified in light of the participants' responses and the investigator is able to probe interesting and important areas which arose during data collection.

Procedure

The researchers made use of the social media platform to solicit for interested participants. This special group of participants were then contacted and the questionnaire and the interview schedule was given to them 2 weeks in advance. The interviews were done after the workshop in a quiet room and lasted between 20 and 40 minutes for each participant.

Data analysis

The standard procedures for analysing data as outlined in the IPA approach were followed. The researchers read repeatedly the contents of each transcript after data collection. The re-reading was done as to note emerging themes from the initial notes as captured from the questionnaire and the interview schedule. Clustering of themes into a smaller number was also done and so was naming each cluster. This process directed the subsequent analysis of the transcripts for the whole sample which was studied.

Ethical considerations

The purpose of the study was disclosed to the participants four weeks before interviewing and administering the questionnaire. The investigators availed to the participants the aim of the study (Chetty, 2016); other sufficient and accessible information about the research so that they could make an informed decision as to whether to become involved, or not (Singh, 2019; Gray, 2014). The investigators observed some ethical considerations like confidentiality, informed consent, privacy, respect and anonymity of the subjects (Makore-Rukuni, 2004) and confidentiality (Creswell, 2012).

RESULTS

Cultural games and activities utilised in teaching mathematics at ECD level

The researchers asked some teachers in to identify cultural games and activities that they utilize in their lessons and the teachers reported that the practice increased participation by the learners during mathematics lessons. Here are some examples of games and cultural activities one such respondent highlighted:

“There is a game called arauruor pada, where a child balances on one foot and uses it to push a stone from one drawn rectangular box to the other can be used in the teaching of the concepts of balancing and counting. When playing the game, the player scores more by balancing on one foot without resorting to using the other foot and pushing the stone across squares drawn on the ground. In order to balance on one foot one has to strategically position oneself on that foot. The learners can then be asked to transfer that skill and use it when they learn the concepts of balancing, mass and weight in mathematics. They also learn to count in the process because one has to remember whether she/he will start from which box. A see-saw using a plank can also be used to teach balance, mass and weight. As the learners play the see saw game on planks, they can see that children of the same weight will balance the planks while those of different weights will enable the planks to move up and down. The skipping game may be used to teach concepts of counting and balancing. As they skip the rope they would be counting.”

[Respondent, female ECD B teacher]

Another respondent indicated use of role plays with a cultural flavor as reported below:

“With young learners, we also utilize mud play/Playing house (mamhuza) where children use clay/mud to bake cakes using different shapes of containers help in the teaching of shapes. Problem solving can be learnt when they do role plays as family members such as fathers mothers, children and the extended family members. Problems of money, food, buying and selling can be role played and the skills can be transferred into solving mathematical problems in class.” [Respondent, male ECD B teacher]

Results show that mathematical skills are developed when they count, measure lengths, capacity and volume during their role play. During hide and seek and scavenger hunt games, learners count and memorise as one such respondent explained:

“They are made to remember what they have been instructed to look for. As they play hide and seek, some children hide in different places and those who remain must count to (10) before they run around looking for those in hiding. Those in hiding have to memories what they are looking for. The same applies to those playing the scavenger game. Both the skills of counting and memorizing are crucial in mathematics.” [Respondent, ECD B teacher, male]

Through games and cultural activities, learners can also practice mathematical concepts such as sharing and division as this respondent emphasized:

“Tsoroor draft encourages pupils to divide and share when they give each other the playing stones, seeds or bottle tops and allocate each other into groups. Sets and addition is also learnt during the game. The game involves putting the stones or seeds into holes.

There is a choice of the number of holes and the number of stones in each hole.” [Respondent, ECD B teacher, female]

There are other games, like *zairakaora*, which teach learners observation and concentration skills as this other respondent indicated below:

“Zairakaorais a game where one people form a circle while sitting facing inside. One person holding a stone or stick moves round the circle singing “zairakaora” and then unnoticed drops the stone behind somebody’s back. That individual should notice and run after the person who dropped the stone. This game teaches children to be observant and to concentrate.” [Respondent, ECD B teacher, female]

Addition, subtraction and behavioural skills like turn taking were effectively taught through games like *nhodo* as explaine below:

“Nhodo /inotahelps children to add and subtract. During the game, stones are placed in a hole. The first player throws a stone in the air and quickly tries to scoop all stones out of the hole before catching the stone again. The player then scoops one stone at a time back in to the hole. During the second round, two stones are scooped back at a time and so forth until the player comes to a point where she scoops all the stones in the hole.” [Respondent, ECD B teacher, female]

Being observant and accommodative was also engendered through games like *sarurawako* as indicated by this respondent:

“Sarurawakokadeyadeyais a game where one sings and describes the person he/she wants to pick. This game teaches the children to be observant and learn to accommodate others during group activities. The teaching of sets can also be facilitated because the children would form groups.”

[Respondent, ECD B teacher]

Besides games, there are other items that are made or practiced by rural folk that can also help in the teaching of mathematics. One of them is the preparation of dressing up accessories for cultural dances using scarves, sisal or leaf streams and bamboo hoops. They are worn around ankles and wrists and can help in the teaching of quantities, numbers and volume. They have to know the quantity that makes good sound and the number of seeds to put in a 'hoshho' if they are going to tie these around their legs.

The effect of cultural games and activities utilized in teaching mathematics at ECD B level

The respondents in the study were asked to give their views on cultural activities which could be employed in the teaching of mathematics at ECD B level in the primary school. The following excerpts include some prominent activities which the respondents utilized:

“Making brushes/brooms using grass or reed (tsanga) helps children learn sets. They have to group certain type of grass or size of reeds to produce certain types of brooms. Pot making using clay helps children practice concepts such as shapes, size and numbers. There are different sizes and shapes of pots. The building of round huts can be used during the teaching of drawing circles which lead to the use of compass. The teaching of circumference and area of a circle is also made easier. Fire places are made using mud or stones, ‘mapfiya’. This teaches preservation of heat and balance.” [Respondent, ECD B teacher, male]

Specific activities for teaching prediction especially of time was covered as one respondent explained:

“Predicting can be taught using examples that the Shona people believe in. An example is when the rainbow appears when it is raining and is taken to mean that the rain is going to stop. A chicken coming out during drizzle means there would be rain preparing to fall (guti). The Shona find shades from trees when they are eating. This concept can also explain the time of day. They know when shade is at its fullest. The length of shadows versus that of trees can be used to teach measurement and angles as well.” [Respondent, ECD B teacher, female]

There were other activities involving measurement of heat and temperature. The respondents used rutsvairo as this respondent explained:

“Veldt fires rutsva (in Shona) during summer are done during particular periods. This is usually early in the morning or after the sun has set. These can be used to explain heat and measurement of temperature. Fish nets can be used to explain mass, weight, balances and probability. Fishing teaches sets when they sort fish according to size, colour, shape and type. The casting of a fish line into the water helps in the teaching of length and speed. It also teaches weight. The feel of the fish line indicate to the fisherman that there is a fish caught. Winnowing, (kurudza) which is done after harvesting grains like sorghum, rice and wheat can be used to teach force and wind direction.” [Respondent, ECD B female]

There was a variety other activities which were geared towards problem solving. This respondent described preventing water from splashing out of buckets and making babies quiet:

“Problem solving is learnt by performing certain non-taught activities. One such example is when women go to fetch water using open buckets, and they put leaves on top of the water to avoid the splashing of water. Other examples include that of quieting a crying baby by shaking one’s back while carrying the baby at the back, making house cool on hot days, lighting fire without matches by making use of borrowed burning firewood or charcoal and making a box with wood and nails but no hammer. A stone can be used as a hammer. Children in rural areas swim in rivers. They teach themselves and from this they learn to float and at what speed to travel depending on length, width and depth of the dam or river and the strength of the current. When children share fruits like oranges, mazhanje, matohweetc, they break them into pieces

(zvidimbu) using their hands. This is a way of teaching fractions. Matohwehave shapes that show demarcations and hence the idea of fraction can easily be explained.”

[Respondent, ECD B female]

Respondents reiterated the importance of counting especially in mathematics. Many Shona poems were used and this went beyond number 10 as indicated below:

“The Shona way of counting after 10 (gumi) is very clear that its $10+1$ or $10+2$ i.e gumiNeimwe(ten and one), guminembiri(ten and two) etc. This way of counting can help in the teaching of addition, multiplication and counting.” [Respondent, ECD B male]

In some cases, the teachers indicated that they used routine programmes like herding cattle as this respondent said:

“Herding cattle can also be used to teach sets where children look for those that belong to their families and sometimes know them because of their colour. There is also time factor when they decide on time to take the cattle and goats out of and back to the kraals. Whistling (muridzo) is used when calling each other and this teaches them sound, distance and speed.” [Respondent, ECD B teacher]

DISCUSSION

The quality of learning in the teaching and learning of mathematics depends on the on approach or methods used by the caregiver. Games, activities and ECD methodologies in this case are in sharp contrast to authoritative methods. This is so because they are child-centred. Children are exposed to various games and activities to discover concepts on their own. Caregivers perceive the role of cultural games and activities in the teaching and learning of mathematics in ECD B class in unique and different ways. In this vein, Peacock (2013) also argues that critically, the take-up of the new teaching and learning methods poses a difficult task for the caregivers since human nature tends to be conservative whenever there is ‘change’ only a few join the bandwagon.

Results in the present study show that methods that employ cultural games are child-centered and different from traditional methods of teaching. The shift from traditional methods of teaching made ECD caregivers feel that their authority in the classroom had been eroded as Peacock (2013) also emphasises. This is because the activities of finding knowledge ,interpreting results and testing hypothesis against reality as a route to understanding and the secure retention of factual knowledge .This is done in methodologies and as they use Shona traditional cultural games in socio-dramatic play and co-operative play. These methods are in keeping with Biehler and Snowman (2017) who indicate that teachers feel that they ought to be doing something all the time if they are to justify their positions. The pupils will not be learning. Thus too much teacher talk makes pupils have too little opportunity to play games to express their ideas, or to engage in the tentative exploration talk which is of great importance in learning.

Among all ECD methodologies in mathematic such as Shona cultural games, drama problem-solving, experimentation, field trips, projects requires pupils to work in groups as they play different cultural games(Pretty, 1999).Those methods develop pupils mathematics and language acquisition as they play in different types of cultural games. Pupils also learn mathematic concept and language from the adults and knowledgeable peers. Caregivers should engage pupils in Shona cultural games that are found within their immediate environment (Vygotsky, 1978 cited in Biehler & Snowman,2017). In response to the above statement Peacock (2013) argues that teachers feel that the neat rooms in the classroom were being disrupted to give room to group work. Peacock goes to say the previously tidy classroom corners had now become a junkyard full of material collected for use by pupils in their play. Peacock (2013) says teachers perceive using games in teaching and learning of mathematics as playing and merely wasting of time.

However, games encourage pupils to talk and socialize with other peers and with adults.

Children strengthen their understanding through playing traditional cultural games. Pretty (1993) posits that many games are simultaneous. For example; they attempt to model some real life problems situations. He goes on to say the chief advantages of Shona cultural games in mathematics are that children are active participants rather than passive observers. Pupils make decisions and solve problems and react to the result of their decisions. Cultural games involve getting, recalling and information in order to solve problems.

CONCLUSION

The research explored the mathematical ideas that are found in the indigenous game of pada, tsoro, nhodo, and zairakaora. It was revealed that a lot of mathematical ideas are found in those traditional cultural. From the research results it was discovered that the concept of counting was embedded in the game of 'pada', 'tsoro', 'nhodo'. Teachers can make use of these results in the teaching and learning of mathematics during the early years of primary school mathematics. These games can enable children make connections between the formalized ways of counting and their everyday life. Children generally enjoy playing so in the process of playing they can also learn how to count. This also teaches learners to pay attention since in playing the game they need to be very alert and also need to concentrate on what they are doing so that no cheating occurs. The idea of properties of rectangles is also found in the game. Children learn about shapes from what they already know and this would help them to understand the concept better.

Children must learn school mathematics in a way that will make them want to think mathematically rather than in a way that will make them want to avoid mathematics at all costs. Thus the use of games such as pada in the teaching and learning of school mathematics is one way of motivating the learners. These ideas from the game of 'tsoro' can be used in introducing the concepts so that learners can understand them better before moving to abstract problems. Games can also be used to reinforce ideas. Mathematics is not a solitary activity. It should be done and learned with others. Games and other activities provide an opportunity for learners to work together. Teachers need to move away from the chalk and talk way of teaching mathematics and try to involve the learners as much as possible, informed about the research results, which show the existence of mathematical ideas in different cultures.

RECOMMENDATIONS

The study makes the following recommendations:

1. ECD caregivers should continue engaging pupils to participate in cultural games such as 'nhodo', 'pada', 'mahumbwe' and many other cultural games that are found within their cultural context, with the norms and values of their society, which develop the holistic child.
2. There is need for training of young ECD caregivers on how to handle cultural games pupils may engage in during teaching and learning of ECD B class. Young ECD caregivers should exhibit positive attitude while cultural games are being played during teaching and learning of ECD Class B situation as those games have an impact on how pupils interact with the environment.
3. There is need for teachers to make mathematics more relevant by linking it with activities familiar to the students so that they become motivated to do the subject. Teachers need to move away from the chalk and talk way of teaching mathematics and try to involve the learners as much as possible, informed about the research results, which show the existence of mathematical ideas in different cultures.

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