

Unpacking Teacher's Practices in Early Childhood Mathematics Classroom

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Abstract

The purpose of this study was to bring to light the various practices of teachers in the early childhood Mathematics classroom. For the study, two early childhood educators in the Effutu Municipality of the central region of Ghana were randomly selected. Thematic analysis was used to analyse the data. Findings from the study identified that teachers are in the known of the various strategies and assessment procedures but have been doing what they called conveniently and there is inadequate support from parents of early grade learners. This study recommends that constant professional development training and workshops should be organized by District Education Directorate for early childhood educators to help them do what is best for student and not convenient for teachers and also through Parent Teachers Association (P.T.A) meetings, teachers should be made aware of the challenges teachers are facing and what is expected of parents to help teachers educate their children well.

Keywords: Anecdotal records, kindergarten, Antecedents

1.0 Introduction

Today, all basic schools in Ghana follow a prescribed mathematics teaching programme contained in the school commonly known as the Mathematics curriculum (Nabie, 2011). The 2008 educational reform also saw the inclusion of KG in mainstream education. This drew the attention of educators and policymakers to designing a structured curriculum to help these learners acquire the best of instruction. Teachers are to provide the opportunity for these young learners to explore the various mathematical situation in their environment to enable them to make their observation and discovery, with the use of real-life experiences to help the child apply lessons learned to their daily lives (MOE, 2019). The curriculum contains the topics to be treated at each level in each term of the academic year. The curriculum also helps early childhood educators to identify the activities to be used, the instructional material to select for various topics as well as the assessment procedure to employ to assess the learning progress of the young learners. These early childhood educators are expected to take into account the needs of individual children when planning kindergarten instruction (Thomson, 2017). For example, children cannot separate their everyday experiences in their immediate environments from what they learn in their kindergarten classrooms. Thus, it appears that for instructional strategies to have the desired impact on children's development, the experiences of children should be the driving force (Thomson, 2017). Teachers' practices in the early childhood classroom are very crucial because they contribute to effective teaching and learning in early childhood classrooms, which in turn, impacts children's development in diverse ways. That is the interaction patterns, instructional strategies, instructional materials and the assessment procedure all determine how best the child learn in the early childhood mathematics classroom.

1.1 Instructional Strategies used in Early Childhood Education

Instructional strategies are techniques teachers use to help students become independent, strategic learners (Sakellariou & Rentzou 2011). These strategies become learning strategies when students independently select the appropriate ones and use them effectively to accomplish tasks or meet the goal. Instructional strategies help motivate students and organize information for understanding and remembering as well as monitor and assess learning. The classroom is a dynamic environment, bringing together students from different backgrounds with various abilities and personalities. Being

an effective teacher, therefore, requires the implementation of creative and innovative teaching strategies to meet students' individual needs. Early grade instructional strategies have become the interest of many researchers. Studies conducted in recent years show that there is a similarity between children of 0-8 years of age in physical, cognitive, language, social and emotional development. For this reason, Ilgar and Coşgun, (2013) agree that early childhood education should include 0-8 years of age rather than 0-6 years of age. With this assertion, it is necessary to use developmentally appropriate practices to help learners in the early stages of their academic journey (Essuman, Korda, & Essigyan, 2021). It is also important for early childhood educators to adopt strategies that are very effective and appropriate for learners of that age, Lesh and Lamon (1992) listed theories like behaviourism, constructivism, social constructivism as well as lists of learning theories: multiple intelligences, right- and left-brain learning, activity theory, learning styles, Piaget, and communities of learners as the theories that support the appropriate strategies for teaching in the early childhood education.

Essuman et al (2021) opine that active participation by learners in the early childhood education programmes has a positive impact on their academic success throughout the educational period, they are of the view that the early grade forms the foundation on which learners stand on to propel themselves to the next stages of their academic journey. Marshall & Rossmna (2016) listed some of the methods that apply to pre-primary school level of education include play method, supervised activity method and activity method. Demonstration, games, field trip, storytelling picture method and assignment. Other methods that can be used include modelling, play, debate, project work, snowballing, mind mapping and group work.

1.2 Assessment Practices in Early Childhood Classroom

Assessment is a process of collecting and evaluating information about learners and using the information to make decisions to improve their learning. Authentic assessment refers to the procedures emphasized by Piaget's cognitive constructivist theory of learning. Authentic assessment, also known as play-based, naturalistic, or performance-based assessment, is a method of collecting information by kindergarten teachers who are well-informed about the behaviour of young children as they unfold in kindergarten classroom environments, according to Dennis, Reuter, and Simpson (2013). Authentic assessment evidence helps to highlight the strengths and weaknesses that each child brings to every learning situation. These are not surprising because it gives teachers insights into how young children put into practice their knowledge and skills in a real-life classroom context. Some of the examples of authentic assessment instruments are as follows;

1.2.1 Interview

One of the most important authentic assessment instruments is the interview. This assessment tool is particularly useful because it helps to illustrate young children's abilities across a wide range of learning contexts. Observational testing is a joint effort between the teacher and individual children's parents, as well as others who are knowledgeable about how young children learn. This is important because the kindergarten teacher requires input from a variety of sources, including teaching assistants, other teachers, and parents, to determine each child's developmental stage (Mwong & Wanyama, 2012)

1.2.2 Observation

Another assessment tool for gathering knowledge about individual children's growth and development in kindergarten classroom settings is observation (Dennis, Reuter, & Simpson, 2013). The

kindergarten teacher's main concern during the assessment is to search for specific abilities that a child exhibits when participating in learning activities (Bredekamp, 2014). Observational data is a critical component of authentic evaluation procedures for collecting knowledge about individual children's developmental levels. Running and anecdotal data, Antecedent, Behaviour, and Consequence (ABC), study, and permanent goods or portfolios are examples of assessment instruments that come under observation (Dennis, Reuter, & Simpson, 2013). However, the importance of each of these observation evaluation techniques in assessing children's development is a concern that arises. Each one is important in different ways, as shown below:

1.2.3 Running Records

Running records is an assessment tool that can be used to determine the sequence of events that occur in a classroom over some time. This is understandable given that it offers information on the behaviour of young children over time. Nonetheless, to realize its full potential, the teacher must be as impartial as possible, so that the true behaviours of the children observed during the observation can be captured rather than the teacher's interpretation of what occurred. Kindergarten teachers are expected to include the following information; date and time of the information, names of children involved, location of the episode and what individual said (Dennis, 2002).

1.2.4 Anecdotal Records

Anecdotal records enable the kindergarten teacher to concentrate on the specific behaviour of individual children over time to create an appropriate mechanism for evaluating the level of development of children in a group setting as well as on an individual basis (Dennis, Reiter, & Simpson, 2013).

1.2.5 ABC Analysis

The ABC analysis is an evaluation technique that attempts to record a child's behaviour by first determining what caused the behaviour and then determining what occurred after the behaviour was triggered. These factors aid kindergarten teachers in determining why certain children behave in certain ways (Clay, 2000).

1.2.6 Permanent Products or Portfolios

Portfolio assessment may include examples of a child's work, photographs, graphics, or audiotapes. These items are inserted into a file to collect information about specific works that the child has completed over time. Portfolio evaluation aims to keep track of a child's progress over time (Gullo, 2007). In short, a combination of these data collection methods is likely to provide kindergarten teachers with insight into the individuality that each child brings to the kindergarten classroom. This information would then serve as a compass to enable the teacher to effectively plan the curriculum which in turn, help young children harnesses their potentials.

2.0 Methods

The study sought to Unpack early childhood educators' practices in the Mathematics classroom. A case study design of the qualitative research method was adopted for the study because the research problem of the study sought to bring out the various practices done by the early childhood teacher during the teaching and learning process. By using this type of research design, the researcher was

able to understand the phenomenon, learn the variables as well as learn from the participants through exploration (Creswell, 2013). The study employed observation and interview as the main instrument to answer the research question.

2.1 Study Participant

A school was conveniently selected for the study of which two teachers who are in K-G 1 and KG 2 were involved in the study. KG 1 had a class size of 46 pupils with 21 females and 25 males while that of KG 2 also has a class size of 43 pupils 23 female and 20 males from A.M.E Zion Primary school in the Effutu Municipality with an average age of 4 and 5 respectively. K-G1 teacher holds a diploma in early childhood education from Ola College of Education while K-G 2 teacher holds Bachelor of Education in early childhood education from the University of Education Winneba.

3.0 RESULT AND DISCUSSIONS

The curriculum is a statutory document that defines the breadth and depth of the mathematical education programme (Nabie, 2011). So, analysis of the data was guided by the curriculum provision for teaching early childhood mathematics (NaCCA, 2019). Thematic analysis was applied to the interview data. Interview data were transcribed into text. The text data was read through several times to make general sense of participants' descriptions. Coding units were identified in the interviews data which captured participants' expressions of teacher's practices in the early childhood mathematics classroom

During observation sessions, field notes were taken. Fieldnotes are the writings or text accounts reported by the researcher during an observation, according to Creswell (2013). The descriptive field notes of the events, actions, and behaviours of the teachers (i.e., what happened, how it happened) were collected in this report, as well as reflective field notes, my narrative and personal opinions, ideas, and themes that emerged during the observations. In effect, four themes that reflect the research questions constitute the analytical frame for analysing the data namely: teaching strategies and assessment procedure used in the early childhood mathematics classroom.

Instructional strategies/methods teachers often use in the early childhood mathematics classroom.

Interviews were conducted for an in-depth understanding of instructional strategies/methods teachers often use in the early childhood mathematics classroom. When teacher1 (K.G.1) was asked what instructional strategies do you know of that is used in the early childhood mathematics classroom to learn mathematics? Teacher 1 maintained that:

“Yeah! I know of, games methods, field trip, modelling, play, debate, project work, snowballing mind mapping group work and others through series of workshop and my self intuition”

In describing some of the instructional strategies, the researchers asked her what mathematics practices she engages in that might help the student learn mathematically.

She said: *“I usually use games ... this is because games help me to involve every student in the teaching and learning activity. This activity helps me to guide every student in building up a lot of situations in learning mathematics”*.

In response to the same question, what instructional strategies do you know of that is used in the early childhood mathematics classroom to learn mathematics?

Teacher 2 said: *“Hmmm... ok I know of play, modelling, mind mapping and games”*

In response to the above question, the researchers continued to ask what strategy do you usually employ in the mathematics classroom to help students learn mathematics?

Teacher 2 said: *“I usually use play, games and trip but due to my large class size monitoring become difficult for me”*

In sum, evidence from the data appears to suggest that teachers are aware of the right strategies to employ in the early childhood mathematics classroom to make teaching and learning fun and help students in learning mathematics. A connection between social interaction and learning was mentioned by all participants in their interviews. However, according to the data, monitoring of individual students was seen as a challenge due to the large class size. The observations made showed a learner-centred classroom for mathematics learning. In addition, it was found out that both teachers use demonstration, assignment method, storytelling and play greatly in their lesson

Assessment Practices in Early Childhood Settings

During the interviews, the participants recalled their own experiences in the assessment of their students in the mathematics classroom. When the teacher1 (K.G.1) was asked what assessment, the procedure is you aware of. Teacher 1 maintained that:

“Ok... I am aware some of the forms of assessment and used it with the KG assessment tool which involved interview, observation, portfolios and running records which deals with keeping records of pupils’ behaviour which they use at the end of the term”

In response to the above question the researcher quickly asked which one do you employ and why? Teacher 2 said:

“Well... I usually use observation, class exercise and assignment which is less stressful due to my number on a roll”.

Similarly, Teacher 2 had this to say in response to the same questions. What assessment procedure are you aware of? Teacher 2 said:

“Hmmm... for that I know of an individual class exercise, oral questioning, observation, assignment, portfolios and parent ratings”

Researcher: What assessment practice do you usually employ and why?

Teacher 2: *“I normally use oral questioning, observation and class exercise because these are the ones, I am conversant with”*

Researcher: what difficulties do you encounter during the assessment of your student?

Teacher 2: *“hmmm... is about the assignment. Whenever I give an assignment most of the students fail to bring back their assignment book to school so I don’t usually give assignment”*

Researcher: Is there anything you want to add?

Teacher 2: *“yes I think parent also have a part to play in making sure that their wards do their assignment whiles at home and make sure that they return their books to the school”*

Even though participants mentioned a wide variety of assessment procedure showing their rich knowledge of assessment it was clear that they used limited procedure in assessing the students due to class size and lack of parents’ support. During my observation, it was noticed that the assessments

used by the teachers were in line with the instructional objectives of the lesson. Both teachers used individual class exercise and oral questioning as an assessment tool for assessing the lesson thought. It was also seen that teachers give quick feedback to students and corrections were done by the whole class which served as a remedial for the week ones.

Conclusions

The following conclusions were drawn from the study:

1. The study shows that teachers are in the known of the various strategies and assessment procedures but have been doing what they called conveniently.
2. Class size and lack of parental support are posing a challenge for good work done in our early childhood mathematics classroom.
3. Class monitoring and individual teaching is less practice by teachers.

Recommendations

Early childhood educators are doing incredible jobs. Their job is very demanding. From the study, the respondents (teachers) did their best with the limited resources. But the following recommendations were made:

1. Constant professional development training and workshops should be organized by District Education Directorate for early childhood educators to help them do what is best for student and not convenient for teachers.
2. Large class size makes it difficult for teachers to use some recommended teaching strategies and assessment procedures such as small group instruction and interviews in the early childhood mathematics classroom. It is therefore recommended that conscious effort should be made through the Municipal/District Assembly to reduce the class size by providing additional classrooms.
3. Through the Parent and Teachers Association meeting, parents should be made know of the challenges teachers are facing and the support they need from them in other to help educate their ward well.

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