

*Full Length Research Paper*

# **Analysis of preschool curriculum in East Gojjam Zone: Implication to quality early childhood education**

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**Developmentally appropriate curriculum is a component for quality early childhood care and education. This study was conducted in Debre Markos town, East Gojjam Zone, Ethiopia. The study aimed to evaluate if the textbooks implemented by private preschools are developmentally appropriate or not. Qualitative case study approach was employed and Mathematics and Environmental Science textbooks for upper kindergarten class of one private preschool were purposefully selected. The textbooks were analyzed using a checklist focusing on the extent to which contents in the textbooks are appealing, play-based, employ concrete/realistic contexts; contain activities of counting, simple addition and subtraction; contain activities of seriation and conservation, and concepts about shapes and colors. The study found that the Environmental Science textbook pictorially represents parts of the body along with corresponding names, personal hygiene and children's daily routines, concepts of time, pictures of different sizes of animals and objects and domestic and wild animals and colors. Besides, it introduces children about the sources and uses of water and air. Likewise, the Mathematics textbook comprises pictures of different animals and objects and activities related to ascending and descending orders. Counting from 0 to 10 and counting forwards and backwards, names and pictures of simple geometric figures and basic colors, and lines and shapes are also emphasized. Both textbooks contain contents related to size, color and classification. Despite these qualities, these textbooks are less appealing to children and do not provide concrete examples; they are poor in containing play, songs and rhymes and fail to suggest the use of environmentally available, concrete and realistic teaching materials to enhance understanding of idealistic concepts. The two textbooks lack several developmentally appropriate contents and fail to relate contents with naturalistic and environmentally available materials. This implies that the textbooks need to be revised to fit with preschool children's level of cognitive development. The findings of this study have implication for designing developmentally preschool curriculum.**

**Key words:** Curriculum, developmentally appropriate, preschool, Mathematics, Environmental Science.

## **INTRODUCTION**

Research shows that the earliest years of a child's life is a critical time for the biological, neurological,

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psychological, social and emotional development. There is strong and consistent evidence that high quality Early Childhood Education (ECE) impacts children's academic development and their emotional and social well-being more powerfully than any other phase of education (Whitebread, 2015). Studies indicated that quality Early Childhood Care and Education (ECCE) enables children develop greater confidence and ability to concentrate; better regulation of their emotion and behavior and improved cooperation with peers and adults (Rossiter, 2016).

Quality curriculum is one which is relevant, consistent, effective and sustainable (Stabback, 2016) and shall include topics that have particular importance to the local community and tasks in which children are familiar with (Whitebread, 2015) and developmentally appropriate.

The quality of the curriculum is the key component which contributes to the holistic development of children (Stabback, 2016). Thus, curriculum in ECCE should be designed to nurture the holistic development of the child. In other words, the curriculum should be developmentally appropriate and be designed in line with developmental abilities, needs and interests of preschool children.

One of the characteristics of a good quality ECCE curriculum is to employ play since early childhood stage is a play age. Children at this stage learn through imitation, talking, and experimenting (Samuelson and Carlsson, 2008). Therefore, more focus should be given to play based learning approaches within the school curriculum (Whitebread, 2015).

A developmentally appropriate preschool curriculum is one which is more culturally appropriate that provides children with learning skills and helping children to succeed in secular primary schools and includes a wide range of factors that impact the care and education of young children (Diwunma and Obiagel, 2013) among which teaching method, child teacher interactions and equipment and material. It is also characterized by play based educational practices; learning based on experience of children; emphasis on emotional wellbeing of children; nurturing children's cultures (Walsh et al., 2010) and it is mainly based on the cognitive constructivist perspective of Piaget.

Curriculum for preschool children should be motivating and it has to inculcate the needs as well as developmental stages of children and it should be indigenous since non-indigenous curricula will have a negative impact on social inclusion of children and promote children's negative identity (Rossiter, 2016).

Early childhood education in Ethiopia was given less focus for a long period of time and it was left mainly for private business owners and faith organizations (MoE, 2010, 2015). However, there is rapid expansion in this sector in recent years. The expansion allows preschool children the opportunity to get access of literacy and numeracy. Yet, there is a great disparity on what

preschool children are expected to learn theoretically and what they have been learning practically.

Debre Markos town is the capital of East Gojjam Administrative Zone located in Northwest Ethiopia. There are more than 15 private owned preschools in this town. These preschools do not implement state mandated curricula and the majority of them are established with the primary purpose of generating business than provision of education and care service to children. The textbooks used by these private preschools have never been audited by concerned stakeholders. Besides, no study was conducted to evaluate if the textbooks used by private preschools are developmentally appropriate or not.

The major objective of this study was to evaluate the extent to which Mathematics and Environmental Science textbooks for upper kindergarten classes implemented by privately owned preschools in Debre Markos town are developmentally appropriate. The age of children attending upper Kindergarten class in this particular school ranges from 5-6 years. Viewed from the theory of Piaget's cognitive development. This stage is called preoperational stage and children's thought is based on what they see. Mathematics and Environmental Science textbooks were selected since these two subjects are highly integrated and support language, literacy and vocabulary development. (Brenneman, et al, 2009).

The study has the following environmental specific objectives:

- (1) To investigate the extent to which Mathematics and Environmental Science textbooks contain contents related to Classification, Seriation and Conservation.
- (2) To evaluate the extent to which play and rhymes are included as pedagogy to teach Mathematics and Environmental Science.
- (3) To check if the contents in Mathematics and Environmental Science textbooks contain culturally relevant and contextual contents
- (4) To investigate the degree to which the contents are related to realistic and concrete objects.
- (5) To investigate if contents related to counting and concepts of time are included in the textbooks.
- (6) To examine if basic shapes and colors are included or not in Mathematics and Environmental Science textbooks.

The findings of this study would be useful to policy makers, curriculum designers, parents and teachers. Besides, these findings may serve as a bench mark and preliminary evidence to conduct similar studies in different preschool centers and also to conduct an evaluative study on other textbooks. Overall, the findings of this study could contribute to the designing of developmentally appropriate curricula for preschoolers.

Although there are several dimensions of quality early childhood care and education, this study was delimited to exploring quality of the curricula in one private owned

preschool in Debre Markos town, East Gojjam Zone, Amhara Regional State, Ethiopia. The study was also delimited to evaluating only Mathematics and Environmental Science textbooks for the upper kindergarten classes. Moreover, although curriculum is a broader concept which includes content, teaching learning process and assessment, the focus of this study was only on the contents of two textbooks for upper kindergarten classes in one preschool.

There are several features of quality early childhood care and education. Yet, this study did not include textbooks of all subject matters and those which are implemented by other private preschools in Debre Markos town. Thus, the findings of this study could not be generalized to other private schools found in the study area.

## MATERIALS AND METHODS

This study employed a qualitative case study approach in which data were collected through document analysis. The analysis was done to check if the text books are developmentally appropriate or not.

Since the design of this study is qualitative, purposive sampling was employed to select textbooks for analysis. Hence, among four textbooks (Amharic, Mathematics, English, and Environmental Science), Mathematics and Environmental Science textbooks were purposefully selected. One of the reasons for selecting these textbooks was that the contents in the two disciplines are horizontally integrated and reinforce each other.

In this study, the investigator developed checklists to collect data after thoroughly reviewing literature on areas of developmentally appropriate curriculum, cognitive development of preschool children, contents and methods of teaching preschoolers and on the importance of rhymes and songs to teach Science and Mathematics for preschoolers and similar issues.

The investigator was guided by ethical issues while conducting this study. For example, he obtained consent from the school principal to evaluate the textbooks. Moreover, the investigator guaranteed to the school principal that the name of the school and its specific location would not be disclosed.

Thematic analysis was employed to analyze data collected from textbooks using checklists. To simplify the analysis, the items measuring developmentally appropriate curriculum were first categorized into sub-themes and these sub-themes were later categorized under nine major themes based on their similarity as indicated in the findings section of this manuscript.

## FINDINGS

This section presents major themes emerged from the analyses of the two textbooks. These themes are concreteness and realistic, Play and songs, Classification and sorting, Counting and sense of time, Shapes and Colors, Counting numbers in ascending and descending orders, Spatial Relationships and Positions, Conservation and size, Measures of time and volume. Themes found in each textbook are presented in detail in this section.

## Themes in the Environmental Science textbook

The following themes emerged from the analysis of Environmental Science textbook: concreteness and realistic, play and songs, classification and sorting, counting and sense of time and shapes and colors.

### *Concreteness and realistic*

The Environmental Science textbook begins by presenting contents about parts of the body. It contains pictures of external parts of the body along with their names. It also recommends the teacher to ask children to touch all their body parts and learn their names. The textbook comprises the number of specific parts of the body such as the number of hands, fingers, toes, noses, and asks children about the functions of parts of each part of the body. Moreover, the Environmental Science textbook pictorially displays those parts of the body which are single such as the nose and paired ones like ears, eyes, legs, hands. As part of assessment, the textbook requires children to match the names with pictures of body parts.

In addition to parts of the body, the textbook has contents related to sense organs. Pictures of the five sense organs and their functions are presented side by side. In the consecutive pages, there are exercises in which pictures of the five sense organs are to be matched with their names and functions.

Besides, there are practical and experimental activities relating to different tastes. For example children are requested to mix different substances with water and then they are requested to taste using their tongue and tell whether it is sweet, salty or sour. In addition to this, the textbook recommends the teacher to help children identify different things found around children's environment using different sense organs. The sources and importance of water and air are also included as contents in pictures and mimic actions. Lastly, the textbook contains an activity in which children are made to recall the uses of water. There are also contents related to the characteristics of air (air is all around us; we cannot see air, we can only feel it and so on).

### *Play and songs*

The Environmental Science textbook consists of concepts of hygiene. Moreover, it contains rhymes about washing hands, face, clothes, brushing teeth, combing hair, cutting nails and keeping the environment clean. There is also a song called 'Clean Lines' to help children memorize these activities. Besides this, there is a song about the color of different vegetables especially about green and yellow.

### **Classification and sorting**

The book introduces children with pictures of different groups of food items like dairy, fruits, vegetables, protein and grains. It requests children to identify and match names with pictures of different food categories. Moreover, it demands children to categorize the different food items under the four groups of food: fruit, vegetable, grains and protein. Furthermore, the textbook contains lessons about the characteristics of living and non-living things, edible and non-edible animals, and domestic and wild animals. Besides, the textbook contains pictures of a bird and a flower and presents assessment questions like “which one does grow, reproduce, move, breathe, and need food” and so on. In addition, there are contents about the characteristics of living and non-living things. Furthermore, children are required to write living and non-living things found around them.

Under the concept of living things, the book presents the characteristics and parts of a plant and how and where plants grow and what they need to survive. Besides, different pictures of domestic and wild animals are presented and there are activities that demand children to tell what these animals eat and where they live. Furthermore, the book shows a list of animals and asks children to classify them as domestic and wild.

### **Counting and sense of time**

The Environmental Science textbook comprises topics related to sense of time. It begins by asking how many times children eat food within a day and introduces the names of meals eaten within different intervals of a day (breakfast, lunch and dinner) vis-à-vis intervals within a day (morning, midday, afternoon). There are illustrations of associating concepts of day and night with the Sun and the Moon.

### **Shapes and colors**

In the textbook, an attempt is made to teach about different shapes and colors by associating with traffic rules (Green, yellow and red colors symbolizing traffic rules). Under this broad area, the textbook presents safety rules at home as well as on the road. There are DOs and DONTs written in simple language (for example: do not play near fire, do not play with sharp things, and many more rules). Besides, as an assessment, the textbook requests children to think about additional safety rules in class and in the school. Furthermore, the text presents lessons about traffic lights and the meaning of green, red and yellow colors in the traffic rules and regulations. Traffic symbols representing ‘Stop’, ‘One way’ and ‘Bend to the right’ are also included in the

textbook.

### **Themes in the Mathematics textbook**

The following major themes emerged from the analysis of Mathematics textbook: counting numbers in ascending and descending orders, spatial relationship and positions, conservation and size, shapes and colors, and measurement of time and volume. Some of the themes found in the Mathematics textbook are somewhat similar with the themes in the Environmental Science textbook. For instance, contents about shapes and colors are found in both textbooks.

### **Counting numbers in ascending and descending orders**

The textbook for Mathematics requires children to match different figures and pictures (boxes, tables, flowers, animals) with equal numbers. Besides, it contains numbers to be matched with words. Furthermore, it contains exercises related to *addition* in which children are requested to count the dots put in different boxes and adding them together. There are also activities about counting forward and backward of numbers from 0 to 9 written in a number line and arranging these numbers from big to small and small to big. The textbook comprises activities of missing numbers on a number line. Assessment activities on writing numbers from 1 to 10 in ascending and descending orders are also shown in the textbook.

To teach the concept of order, the textbook asks children to write the name of cloth they wear first, second and at last among shoes, pair of trousers, T-shirt, pant, socks, shirt and coat.

Furthermore, the textbook introduces two digit numbers and place values of tens and ones and it tries children’s understanding of place values by presenting *single and two-digit* numbers.

### **Spatial relationships and positions**

Concepts of spatial relationships and positions are also given focus in the textbook. For example, there are contents about directions like right, left, middle, bottom right, right center and top right. To assess children’s understanding of these concepts, the Mathematics textbook asks children to circle the picture found in the middle, right or left of other pictures.

### **Conservation and size**

The textbook introduces children to concepts of

conservation, amount and size. For instance, mathematical symbols of addition, subtraction, is equal to, greater than and less than are presented contextually in the textbook. There are also simple addition activities illustrating the numeric symbols and orders children to match equations with their correct answers on the other column. Furthermore, pictures of different sizes are presented to teach the concepts of “bigger” and “smaller” and “shorter” and “taller”.

### **Shapes and colors**

The textbook defines basic shapes and provides activities for children to color these shapes. There are also exercises demanding children to match objects of different shapes with the names (circle, square, triangle, oval and rectangle). Furthermore, features of major geometric figures are presented in the textbook. For example, the number of sides that each geometric figure has, the number of lines it is made of and the number of corners are indicated.

### **Measures of time and volume**

Besides shapes and colors, the concept of time and volume is given due focus in this textbook. For example, there are lessons about measures of months of the year, days of the week, hours of a day and activities that children do in each time of a day, measurement of time, liquids, and space.

## **DISCUSSION**

The two textbooks have both strengths and limitations when viewed from the perspective of developmentally appropriate practice. For example, there is an attempt made to make the contents in the Environmental Science textbook to be somewhat realistic and contextual though not sufficient. This textbook provides opportunity for children to learn concepts of number by enquiring them with questions like “how many hands, legs... do you have”. Teaching about the number of sense organs in the Environmental Science textbook demonstrates the attempt made by the writers to integrate it with Mathematics.

The Environmental Science textbook occasionally suggests the teacher to use concrete and realistic materials to help children understand the given concepts easily. For instance, it reminds the teacher to order children to bring different vegetables to the classroom and learn their smells, colors and tastes. In line with this finding of Bose et al. (2013) recommend that children should learn through exploration, inquiry and discovery

than memorizing isolated scientific and mathematical concepts.

Both textbooks have limitations since play, songs and outdoor activities have been overlooked. In contrast to this, Bose et al. (2013) remind that outdoor activities are essential components for teaching Mathematics and Science to preschool children. Likewise Lee, (2011) argues that young children develop many concepts of Mathematics while they are playing in their daily life experiences and hence they need to be given opportunities for indoor and outdoor plays which are particularly initiated by children themselves. Similarly, Wood and Hedges (2016) indicate that play and freely chosen activities enable them to develop independence, control, and autonomy. Empirical literature (Morrison and McLoyd, 2000; Bose et al., 2013) indicate that teachers should understand that children learn all the time through play and interaction with their surrounding environment.

The role of vernacular language in the learning of preschool children has been totally forgotten by the writers of the two textbooks. In other words, both textbooks are written in English and implemented on children whose vernacular language is Amharic. Furthermore, the songs and rhymes used in the Environmental Science textbook are written in English with difficult words. As a result, children are expected to learn both the contents and the language. In contrast to this, the New Education and Training Policy recommends that preschool and primary education in Ethiopia should be given using local vernacular language (UNESCO, 2007).

Environmental Science textbook has deficiencies in helping children understand the concepts fully. For example, in its attempt to teach about *water* and *air*, it lacks to inform children about the sources of water and what kind of water is drunk at home and so on. Moreover, the concept of air is presented in an abstract manner which is difficult to be understood by children. Furthermore, little effort has been done to use make believe activities using concrete materials to demonstrate the characteristics of air (such as air has weight and occupies space). Elaborating this fact, Morrison and McLoyd (2000) indicates that preoperational children base their judgment on concrete objects and hence their learning need to be assisted with concrete teaching materials. Likewise, Bose et al. (2013), recommend that there must be application of hands-on materials for preschoolers to help them believe and see it happen.

To simplify the concept of air, it would have been good to use different balloons and inflate some of them with air and deflate (letting out the air) to make children believe that air occupies space. In line with the current finding, theoretical literature (Rossiter, 2016) states that the challenge for curriculum for younger children is that it is implemented without the necessary adjustments for

children's developmental capacities and ways of learning. Concepts related to classification are presented in both textbooks. For instance, children are required to identify among the four categories of food. In support of this scheme, scholars (Bose et al., 2013; Brenneman et al., 2009), recommend that children need to be exposed to curricula related to identification, sorting and classification of different objects and animals found in children's surrounding environment. However, the Environmental Science textbook analyzed in the current study has shortcomings in that it presents concepts such as protein, healthy food and so on. These are complex and vague concepts to preschool children. Likewise, there is no consecutive content that enables children to learn these concepts. Moreover, some of the names of the food items presented in the textbook are non-indigenous ones which are beyond children's imagination. In relation to this, Shizha (2013), states that school curriculum in Africa is suffering from lack of indigenous contents and socio-cultural worldview of the African child.

The Environmental Science textbook fails to incorporate context related examples in teaching different concepts. For example, in teaching about the classification of animals, it does not assess children's prior knowledge about the type of domestic and wild animals found at their homes, and in their surroundings.

The Mathematics textbook illustrates different pictures of clocks to teach the concept of time. However, some of the concepts are beyond the level of understanding of the children. For instance, it might be difficult to imagine that children can tell time of the day by looking at the arms of clocks and match them with time of the day (morning, midday, night, and afternoon). Besides, the textbook requires children to write the time that each analogue clock reads and this is too abstract for preoperational children. It would have been good if digital clocks (numbers telling time) are used instead of analogue ones.

The names of traffic colors contained in the Environmental Science textbook (green, yellow and red) have not been presented with respective colors. This might create confusion to children when they see such symbols on the road in real context. Moreover, understanding road signs is too complex for preschool children. The textbook fails to teach the meaning of traffic light colors using songs. Thus, association of colors with traffic rules would be tough for children to memorize. Correspondingly, theoretical literature (Bose et al., 2013) suggests that rhymes and songs need to be used as natural ways of learning for children and should not be excluded from the teaching learning process.

It is good that the Mathematics textbook contains basic mathematical operation symbols of addition, subtraction, is equal to, greater than and less than. However, it fails to consider the cognitive developmental stage of preschool children and lacks to recommend the use of concrete materials in teaching these abstract symbols. Preschool

children could learn these concepts best only if there is association of these symbols with concrete and contextual objects such as potatoes, beans, corks and so on. Likewise, the use of parts of the body such as fingers to help children learn addition and subtraction is not indicated at all. But scholars in the field suggest (Sinclair and Pimm, 2015) that fingers are important to teach counting and addition to preschool children.

Realistic, contextual and concrete examples have not been employed in both textbooks. For example, in teaching about geometric figures, the Mathematics textbook presents concepts such as corner and segment which are vague for children. But, there is no any indication about the use of realistic and local objects that could represent major geometric figures. It would have been good if there is a demonstration of realistic and concrete materials having different shapes (example, the classroom, the school compound, television) and other locally available realistic objects as an illustration of different geometric figures. Likewise, Adefunke and Olatunde (2015) indicate that teachers shall use materials that are readily available in the child's environment while teaching preschool children.

## CONCLUSION AND RECOMMENDATION

The findings obtained from the analyses of the two textbooks showed that some of the contents are beyond the level of cognitive development of children. The two text books also lack to incorporate concrete and contextual learning experiences and totally disregard the use of vernacular language. These deficiencies imply that there is a need to audit the relevance and appropriateness of private school curricula by the Zonal and Regional Education Bureau.

## CONFLICT OF INTERESTS

The author has not declared any conflicts of interest.

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