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Teachers' Analysis of the Complexity Levels of Key Skills Development in the Preprimary School Curriculum in Botswana

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Abstract

Critical skills of pre-reading, pre-writing, reasoning, creative thinking, and working collaboratively need to be developed at an early age. During the pre-primary years, children should develop key skills that relate and integrate the broader outlooks for learning. If the pre-primary curriculum is not conceptualized developmentally by the teachers, it can de-motivate young children by decreasing their self-esteem. Botswana's pre-primary curriculum has six learning areas meant to develop pre-reading, pre-writing, communication, creativity, mathematical and scientific thinking, and self-help skills. Each learning area has expected outcomes (performance targets) and performance indicators to track children's progress. From the inception of the piloting of the reception programme, there were mixed feelings among reception class teachers on the interpretation of the pre-primary curriculum. A quantitative approach using a questionnaire survey was adopted to explore reception class teachers' analysis of the complexity levels of skills development in the pre-primary curriculum of Botswana. Samples were selected using stratified random sampling. The findings confirmed that the content of the curriculum addresses the development of various skills such as pre-reading, pre-writing, numeracy, problem solving, communication, Self-help, and social skills at different levels of complexity. Interpretations of such levels varied from teacher to teacher might be due to Botswana's vast cultural differences and societal demands. It is recommended that the pre-primary curriculum should be presented in a way that leads to a common understanding of the curriculum by every teacher so that developmentally appropriate planning can be enhanced.

Keywords

Pre-Primary Curriculum, Reception Class, Complexity Level, Skills

Development

1. Introduction

Early childhood is a period of various developmental changes that have lasting consequences on the children's future. The first five years are crucial for brain development because at this stage, the brain has a unique flexibility. External stimuli develop neuronal pathways, which, in turn, have an influence on children's developmental skills and competences (Allen & Kelly, 2015). Learning takes place through a dynamic interaction between nature and nurture at this stage. Children can be guided through quality education to acquire key skills such as Pre-reading, Pre-writing, and Numeracy and Problem solving which will relate them to the 21st century skills of problem solving, critical thinking, and creativity to ensure their long-term academic success. These skills are developed by exposing them to a developmentally appropriate environment.

Pre-reading and pre-writing are abilities that every child needs to become a future reader and writer. Pre-reading are the ability to hear and manipulate sounds within the spoken language. The child uses the pre-reading ability to interact with the text before actual reading by just looking at the pictures in a book. A major component of pre-reading skill is being able to hold a book in the correct position. Similarly, the pre-writing skills are fundamental skills children need to develop before they can write. These skills contribute to the child's ability to hold and use a pencil, and the ability to draw, scribble and colour. A major component of pre-writing skills is the drawing of shapes, lines, and strokes before the actual writing of alphabets.

Other major skills to be developed at pre-primary level are numeracy and problem solving. Numeracy is the understanding of number related concepts, what they represent and their magnitude of representation. This understanding is reflected in a variety of skills such as counting, distinguishing between sets and sub-sets, operations such as addition and subtraction. Problem-solving skills are the ability to identify problems, brainstorm on various solution, analyze various answers, and implement the best solutions. Children broaden their understanding by finding a solution to a problem which builds their confidence, helps in managing their emotions, think creatively and persist until they find a solution.

Communication is another skill that needs to be developed at an early age. It is a two-way channel in which the child receives information from other individuals and delivers accordingly. It is vital to develop and maintain these relationships since they include the understanding of how to interact and engage with others. The learning environment for all these basic skills can be at home or anywhere from PreK to reception or early first grade.

Children should be taught skills through a hierarchy of simple to complex activities that are distinct to their level of development. Level of complexity is a

measure, which describes characteristics of organizational learning. Once the skill is introduced in its simplest form and children learn that skill, they become capable of making more complex connections as they progress. The patterns of activity demonstrate pathways of skills development as children show distinct trajectories that are the outcome of the dynamic interaction between the activities and learning in a particular context (Fischer, 1980; Fischer & Bidell, 1998). This skill development theory affirms that any activity plan should have a process information and the expected outcome which can be used for gauging the learning of children.

Anderson and Reidy (2012) reported that cognition, language, motor, and social skills develop at a rapid rate in early years. Therefore, the early years' curriculum becomes an important part of the process since children can be provided instructions that correspond to their developmental level of various skills development. The developmental approach is to ensure that goals and experiences are suited to children's development and challenging enough to promote their progress and interest to develop skills.

Over the past few years, the requirements for enhancing academic performance in preschools have increased at a very high rate (Bassok et al., 2016). In the Botswana context, a pre-primary curriculum was developed by the Ministry of Basic Education (MOBE) based on the set of developmental needs and was piloted in 2013 in reception classes. It should be noted that in Botswana, Reception Class is part of the Pre-Primary programme that covers children of ages 4.5 to 5.5 years. The curriculum has the following six learning areas: Personal, emotional, and social development, Language development and early literacy, Health, nutrition and safety, Mathematical and scientific thinking, Physical, creative, and aesthetic development and Moral and spiritual guidance. The six learning areas are meant to develop pre-reading, pre-writing, communication, creativity, mathematical and scientific thinking, and self-help skills. Each learning area has expected outcomes (performance targets) and performance indicators to track children's progress.

From the inception of the piloting, there were a mixed feelings among reception class teachers on the interpretation of the pre-primary curriculum. A study by Gaotlhobogwe et al. (2022) on the evaluation of the pre-primary curriculum reported that some teachers focused on the learning outcomes prescribed in the pre-primary curriculum and did not follow the developmentally appropriate approaches to promote children's progress. This implies that curriculum has different levels of skills development and teachers were interpreting them differently. Yet, teachers are the main lead to implement the curriculum. A well-designed developmentally and culturally relevant curriculum avoids cultural or individual bias and fosters learning in an enabling environment that gives children opportunities to develop skills through experiential learning.

Thus, the objective of the study was to discuss the teachers' analysis of the complexity levels of skills development in the preprimary school curriculum with

the aim to provide concrete feedback at the time of curriculum review. Teachers are the stewards of the curriculum, and it is crucial to get their views on the various skills and their level of development in the pre-primary curriculum of Botswana. Since a curriculum provides a definite structure and gives direction to reach a specific goal, it should be strategic in a way that every teacher has a common understanding of objectives and learning outcomes.

Theoretical Framework

The Socio-cultural theory of Vygotsky's informed the study. An important perspective in this theory is that human development and learning originate in social, historical, and cultural interactions thus enhancing the development of cognition in which it is rooted and can be fully comprehended (Vygotsky, 1978). Since teachers are part of the society and their perceptions are influenced by the culture and environment, they lived in. Scott & Palincsar (2013) reiterate that by working with others on various tasks, there is adoption of experiences which are shared that leads to the attainment of useful approaches and information.

The Socio-cultural perspective acknowledges that children's knowledge and their development are shaped by the environment they live in, the people around them, and their interactions. The pre-school curriculum does guides teachers, as its implementers on how they can go about developing children's skills. The views by Vygotsky also imply that implementers of the pre-school curriculum, should be aware of individual differences across cultures and be sensitive to the diverse needs of their learners.

2. Methodology

A quantitative approach was adopted toexplore the teachers' analysis of the complexity levels of skills development in the preprimary school curriculum. Since, this research focused on the complexity levels of skills development, a quantitative approach was most appropriate so that the number of times and level of implementation can be calculated. Stratified convenience sampling was used to select 10% of the 539 primary schools from all ten regions of Botswana that had implemented the Reception Class Programme between 2014 and 2018. It is important to note that there were some differences in the implementation of Reception Class Programme due to variations in number of schools, their location and size. These factors were considered during sampling. In total 62 schools were selectedhe selection by region, and geographical location was to ensure that the sample was highly representative.

All reception class teachers from the selected schools (62) were included in the study. The study focused on the early childhood curriculum thus it was realized that the reception class teachers who hold a qualification in Early childhood were the most appropriate respondents to answer the questions related to the curriculum. A structured questionnaire with all six learning areas (Pre-reading, Pre-writing, Communication, Mathematical and Scientific thinking, Socio-emo-

tional development, Creativity, and Self-help) was used for the analysis of the pre-primary curriculum. Teachers were requested to analyse the learning outcomes of each learning area of the pre-primary curriculum to determine the complexity level of skills development. Results were analyzed using SPSS v 26. The levels were defined as follows:

Introductory level content	(Very low complexity)	level 1
Definitions and descriptions and some details	(Low complexity)	level 2
Understanding of relationships between concepts	(High Complexity)	Level 3
Complex understanding of relationships between concepts	(Very high complexity)	level 4

Table 1 presents the responses indicating the complexity level of skills development in various learning areas at preschool age as analyzed by the reception class teachers.

Findings in Table 1 show that 27% the teachers reported pre-reading skills to be developed at level 1, 34% reported that pre-reading skills to be developed at level 2, 23% reported pre-reading skills to be developed at level 3 and 8% reported them to be developed at level 4.

An equal percentage of 26% teachers noted that the complexity level of development of pre-writing skills are at level 1 and level 3, whereas 24% and 15% of teachers indicated that the levels of development of pre-writings kills are at level 2 and 4 respectively.

Table 1. Teachers' analysis of the complexity level of skills development of pre-primary curriculum.

	LEVEL				
	1 % (n)	2 % (n)	3 % (n)	4 % (n)	No response % (n)
Pre reading skills	27 (17)	34 (21)	23 (14)	8 (5)	8(5)
Pre-Writing skills	26 (16)	24 (15)	26(16)	15 (9)	9 (6)
Communication skills	11 (7)	26(16)	32(20)	20 (12)	11(7)
Socio-Emotional Skills	13 (8)	32 (20)	34 (21)	11 (7)	10 (6)
Creativity Skills	18(11)	18(11)	29 (18)	14 (9)	21(13)
Problem Solving skills	18 (11)	24 (15)	29 (18)	11 (7)	18 (11)
Self-help Skills	16 (10)	31 (19)	29 (18)	5 (3)	19 (12)

Key: Level 1 (Very Low Complexity): Introductory Level Content; Level 2 (Low Complexity): Definitions and Descriptions Plus some detail provided; Level 3 (High Complexity): Requires Understanding of Relationships between concepts; Level 4 (Very high complexity): Requires complex understanding of relationships between concepts.

The complexity level of developing communication skills was reported by 37% of teachers is at level 3, 26%, at level 2, while 20% reported at level 4, whereas 11% said at level 1. The Socio-Emotional skills were reported to beat level 3 by 34% of teachers, at level 2 by 32% of the teachers, at levels 1 and 4 by 13% and 11% of the teachers, respectively. A total of 29% of the teachers reported the complexity level of creativity development at level 3. 18% of the teachers reported creativity development skills to be at level 1 and at level 2, while 14% reported creativity development skills to be at level 4.

29% of the teachers reported the development of Mathematical and Problem-solving skills at level 3; 24% and 18% reported the development of Mathematical and Problem-solving skills to beat level 2 and level 1 respectively. 11% reported the development of Mathematical and Problem-solving skills to be at level 4. Finally, Self-help skills were reported to be developed at level 2 by 31% of the teachers. 29% of the teachers reported Self-help skills to be developed at level 3; 16% of the teachers reported the same skills to be developed at level 1; and only 5% reported Self-help skills to be developed at level 4.

3. Discussion of the Findings

Skills Developmental Levels in the Pre-Primary Curriculum Framework

According to the teachers' analysis as indicated in Table 1, the Pre-primary curriculum develops skills of Emergent literacy, Communication, Socio-Emotional, Creativity, Problem Solving and Self-help Skills at different complexity levels (from level 1 to level 4). However, there was a mixed understanding of the levels of skills development in the curriculum by the preschool teachers, which is suspected to have led to some teachers not responding as shown in Table 1. This mixed understanding of the levels of skills development is a cause for concern.

Table 1 shows that majority of teachers reported all skills to be developed at levels 2 and 3. It is worth noting that if the focus of the Pre-primary curriculum is more on the development of high level of academic skills, it can create more stress in children due to decrease in their self-efficacy and encouraging factors which may affect their approaches towards school (Stipek, 2006). Since a curriculum provides a definite structure and gives direction to reach a specific goal, it should be strategic in a way that every teacher has a common understanding of the objectives and learning outcomes.

The teachers' analysis (Table 1) shows that Pre-primary curriculum caters for pre-reading and pre-writing at various levels. The differences in interpretation might be due to the order of performance indicators as written in the curriculum. For example, one of the competencies under pre-writing skills is *to write simple and short sentences to communicate ideas and concepts*. The performance indicators are mentioned in the following order: make letter like shapes, tell the difference between writing and drawing, write three letter words, have good control of the pencil. Some teachers are reporting it at level 3 and some at

level 4 which is the higher complexity level, others are reporting it at level 1 which is low complexity level. The difference in analysis of the levels of complexity is because a teacher might see that the indicators are started at higher level, *differentiating between writing, and drawing* before the child is able to *hold a pencil correctly*. Although it is clearly written in the curriculum that teachers should take the initiative to plan for children at a level which is developmentally appropriate, some teachers were aiming at achieving learning outcomes and pitching the indicators at higher levels. Gaotlhobogwe et al. (2022) reported that because of pressure from parents and supervisors, teachers were pitching the level of the RCP syllabus coverage higher than the expected level of 4 - 5 year which confirms that the teachers were influenced by the culture and society in their analysis and interpretation of the curriculum. Bassok et al. (2016) reported that the current perception is to prepare children so that they can be easily adjusted in the primary school which is mainly done by giving focus on basic knowledge of letters and numbers. The focus of preschool education to place an early emphasis on academic skills rather than following the developmental approaches brings the risk that hinders the children's progressive learning.

The process of developing the child's reading and writing skills also include the sub-field of verbal language skills besides reading and writing skills and they are inter-related (Morrow, 2005). It means that if a child's reading skills grow stronger it will directly affect the writing skills and which in turn will make reading skills grow stronger (Morrow, 2005). It is important that children understand the form, function, and principles of writing before moving to the primary school (Mcginty & Justice, 2009). In other words, children should know how to hold a pencil while scribbling/colouring etc., directions of writing numbers and alphabets because if the children's writing awareness skills are strong, it will predict children's reading skills (Farver, Nakamato, & Lonigan, 2007). This implies that teachers must acknowledge the developmental learning process of children while delivering the curriculum and not to be influenced by external environment (pressure from parents and supervisors).

In early years when children scribble or draw some signs, they are not making random drawings but rather depicting an important part of literacy development (Lopez, 2011). The purpose of writing is communication. Although communication is very important to understand the world; language development should be gradual. It is important to understand that speech develops on its own with immense input and is possible to teach. The levels of communication used in curriculum are at low complexity level (level 1) for ages 36 - 48 months, but it seems to be pitched a bit higher for ages 49 - 60 months. For example, the preprimary curriculum expects children to *correctly answer comprehension questions*. According to Piaget's (1964) stages of development, the child is still at pre-operational stage where he or she is thinking at a symbolic level and is not yet using cognitive operations (comprehension). Skill theory further explains that cognitive structures in the short term are developed as children confront new tasks

and as the complexity level increases it distinctively differentiate between earlier levels (Fischer, 1980; Fischer & Bidell, 1998). Thus, it is important to note that the expected outcome of every learning area should be developmentally appropriate.

Social and Emotional Learning is the process in which children's ability to integrate thinking, emotion, and behavior is developed so that they can perform important social tasks. Children are socially and emotionally developed when they learn practically how to behave with friends, teachers, and others. Research has established that to develop and foster positive attitudes and academic success in children, it is important to include aspect of Social and Emotional Learning (SEL) in preschool curriculum (Denham, 2016; Ornaghi et al., 2017). If less time is spent to develop socio-emotional competencies, it affects the bond between a child and school, as well as long-term school adjustment might be affected (Ferreira et al., 2021).

Social and cultural factors influence all aspects of user's behavior. From the study, teachers reported that skills development for Socio-emotional learning at low to high complexity level (**Table 1**). Botswana is a culturally rich society, and this might be the reason why Social and Emotional Learning (SEL) was scored above the very low complexity level. Considering the Socio-cultural theory, the design of any curricula is influenced by local factors such as human skills, tradition, and socio-cultural values (Moalosi, Popovic, & Hickling-Hudson, 2007) and teachers are responsible for promoting learning situations which are full of emotions (Denham et al., 2012). Some children show internalizing behavior that includes overcontrolled or introvert behaviors which are associated with several depressive and anxiety disorders (Hansen & Jordan, 2017). Such children need teachers' guidance to prevent long term behavior problems through an early learning experience (Gunter et al., 2012). Children who enter school with feeble social emotional skills often demonstrate difficulties in the initial skills of reading, and writing (McClelland et al., 2006).

Creativity has often been construed to be synonymous with artistic expression (Saracho, 2012). It is included in the preschool stage with the belief that children should be given opportunity to become creative, innovative, and enterprising (QCDA, 2009) and therefore teachers must be able to recognize the difference in ability within each classroom.

According to Vygotsky, every human being is equipped with a potential for creativity (Ormrod, 2009). Children are competent to learn, and by exploring in their environment, they discover and demonstrate creative behavior. Creativity has been correlated with intelligence and can take many forms as explained in the Gardner (1993) Multiple intelligence theory. Multiple intelligence theory suggest that children can creatively learn in multiple ways such as kinesthetically, intra-personally, inter-personally, musically, and Visio-spatially.

Reception class gives children opportunities to be creative by involving them in various activities such as free drawing, use of variety of material for self-ex-

pression, pretend play, music, and other developmental activities for large and fine motor development. In this study, the highest percentage on level of skills development was scored at level 3. This is attributable to the interpretation of the curriculum, such as activities for creative development using collage, making mosaics, music, dance which require a good control of the eye-hand coordination. Yet, the children's fine motor skills are still developing. It is important to note that children are at the developmental stage and creativity at this stage should emphasize promoting the creative process rather than the product (outcome). According to Prentice (2000), creativity must be included in curriculum for children to practice imaginative and inventive ways of thinking and doing, which will assist them in future.

When it comes to the level of mathematical and problem-solving skills as perceived by most teachers, the findings indicate that it is above low complexity level. Children's learning of everyday mathematics is an unavoidable feature which usually develops in an ordinary environment without any formal instructions. Teachers should plan activities that give children intellectual challenges and require physical efforts to build a solid mathematical and scientific thinking (Kirkland, Manning, Osaki, & Hicks, 2015; Whitebread & Coltman, 2015). Teachers must know that historically mathematics is considered not important for young children (Newton & Alexander, 2013) but they learn everyday mathematics in an informal way such as "taking away", "adding up", "more and less" which in fact are broad and complex concepts (Clements & Serama, 2007) and are developed through learning practices carried out by teachers (Brandt, 2013). Mathematics is also learnt through the various games they play at home even-though children might not be aware that they are gaining mathematical skills.

The development of self-help abilities to be able to survive and adapt to every condition throughout their life is needed by children (Akhmetzyanova, 2014). Self-help skills such as feeding and dressing themselves develop children large and small motor skills. Children gain confidence in their ability and keep trying new things which build their self-esteem and develops a sense of independence in them. It is important for to have corner informing the pre-primary curriculum which talks to develop self-help skills that prepares children to be ready to face the future challenges of life (Nurani & Pratiwi, 2020). In this study, teachers reported that the analysis of the pre-primary curriculum was rated at low to high complexity level. Children's abilities become increasingly complex as their motor skills develop (Moser & Reikerås, 2016). The self-help skills assist the children to develop positive and adaptive behavioral abilities to deal effectively in adverse situation such as in the era of COVID-19 pandemic. Life skills can be introduced to children through acclimatization according to their cultural background (Singh, 2016).

4. Ethical Considerations

A research permit was acquired from the Ministry of Basic Education and per-

mission was sorted from all regional education offices and selected School Heads where the research was conducted. All teachers signed a consent form [translated in Setswana (an official local language in Botswana) and English] confirming their willingness to take part in the study. The consent form provided detailed information about the study. All participants in the study were protected by exercising confidentiality and assurance that the information gathered was to be used only for educational purposes and for preparing an evaluation report.

5. Conclusion

Children learn in a developmental sequence; and a curriculum guides teachers to help the child to progress through various levels of understanding of concepts that lead to accuracy of skills. The study revealed that the reception class curriculum is adequate in terms of developing basic skills and competencies required to prepare learners for subsequent schooling. Most skills like Pre-reading, Prewriting, and communication skills are developed at level 1 (Introductory level content) and level 2 (introductory level content with some definitions and descriptions), whereas Self-help, creativity, Numeracy and Problem solving) are developed are at level 2 and 3 (Requires understanding of relationship between concepts). The fact that preschool teachers scored most skills at high to very high complexity levels might be due to the action verbs used to describe the performance indicators (such as demonstrate) which is at the application of the knowledge level as per Bloom's taxonomy, whereas the preschool learners are still at pre-operational stage (Symbolic learning). There is therefore a need to use verbs that refer to the remembering and understanding levels which will also assist teachers to have a common understanding by teachers of the pre-primary curriculum.

Recommendations

- Action verbs used in performance indicators should be at the level of remembering and understanding to guide the teachers so that in the quest of achieving learning outcome, they do not skip the developmental process.
- Continuous development of teachers in the form of workshops and seminars should be promoted to up skill them, and cater for the newly employed.
- Teachers should use their professional judgment in the classroom and not be influenced by the external environment.
- Stakeholders need to be educated on how to interpret the preschool curriculum and the value in following the developmental pathway when developing children's skills.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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