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TEACHERS' AWARENESS OF CONSTRUCTIVIST APPROACH FOR TEACHING NUMERACY IN EARLY CHILDHOOD EDUCATION IN AGUATA LOCAL GOVERNMENT EDUCATION AUTHORITY

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ABSTRACT

This study was conducted to determine teachers' awareness of constructivist approach for teaching numeracy in early childhood education in Aguata Local Government Education Authority. One research question and one hypothesis guided the study. Descriptive survey design was used for the study. The population of the study was 210 teachers in 70 Early Childhood Education (ECE) schools in Aguata LGEA. Simple random sampling techniques was used to sample 10 schools and from the sampled schools 100 teachers (comprising of 20 in rural and 80 in urban areas) were sampled. A 10-item structured questionnaire titled "Awareness of Constructivist Approach Survey" (ACAS) was constructed by researcher to generate data from respondents. ACAS is a 4-point rating scale that allows respondents to choose among four options namely, Very High Extent (VHE, 3.50-4.00), High Extent (HE, 2.50-3.49), Low Extent (LE,1.50-2.49) and Very Low Extent (VLE, 1.00-49). The ACAS was validated by three experts two from the Department of Early Childhood and Primary Education and one from Educational Foundations (Measurement and Evaluation Unit), all from the faculty of education Nnamdi Azikiwe University, Awka. Cronbach Alpha Reliability Coefficient was used. The reliability test yielded coefficient index of 0.88. Descriptive statistics (mean and standard deviation) were employed in analyzing the research questions while the t-test was used in testing the hypothesis at 0.05 level of significance. The finding showed that both rural and urban teachers are to a low extent aware of constructivist approach in teaching numeracy in early childhood education in Aguata LGEA. There is no significant difference in the mean ratings of rural and urban teachers' awareness of

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constructivist approach in teaching numeracy in early childhood education in Aguata LGEA. Based on the findings, it was recommended among others, that teachers should be provided with in-service training, seminars, conferences and workshop on the constructive approach to teaching numeracy in early childhood education by Anambra State Universal Basic Education Board (ASUBEB).

Keywords: Constructivism, numeracy, constructivist approach, constructive classroom, early childhood education

Introduction

The foundation of education of the child is the preschool education which forms an integral part of their early education usually given in an educational institution to children aged 1 to 5+ prior to their entering the primary school. Early childhood education sets the stage for future academic success, social-emotional well-being, and lifelong learning. Early childhood education ECE refers to the educational experiences of children from birth to age 8, typically spanning from preschool. This critical period of development lays the foundation for future learning, socialization and emotional growth. Early childhood education as defined by the National Policy on Education (Federal Republic of Nigeria, 2013) as the education given in an educational setting for children aged 3 through 5 years in preparing their entry into primary school. Maduewesi (2015) views Early Childhood Care and Education as a semi-formal education arrangement, usually outside the home whereby young children from the age of three are exposed through play-like activities in a group setting, where mental, social and physical learning are suited to their development stage until mandatory age of formal schooling that is primary education. In this study early childhood education is defined as an education given to young pupils which enables them to construct their own knowledge by interacting with the environments, and thus preparing them for more formal education.

Early childhood education promotes cognitive development, socio-emotional development, physical development, creativity and curiosity, self-confidence and self-esteem, building foundational skills for future academic performance and fostering of love for learning and exploration. The National Policy on Education (Federal Republic of Nigeria, 2013), stipulated the objectives of early childhood education to include: effect a smooth transition from the home to the school; prepare the child for the primary level of education; and teach the rudiments of numbers; letters, colours, shapes, forms etc, through play among others. This shows that numeracy is important at this level of education.

Numeracy is a holistic term that encompasses the ability to understand, interpret, apply, and communicate mathematical concepts in various contexts. It goes beyond basic arithmetic skills and

includes a broader set of mathematical competencies that individuals need for effective functioning in everyday life, work, and society (National Council of Teachers of Mathematics, 2018). Numeracy involves not only quantitative skills such as counting, calculating, and problem-solving but also the ability to apply mathematical reasoning to practical situations. It is paramount that early childhood education provides good environment that will involve the children in active participation such as classification, seriation, numbers, time and spaces and which contribute to the acquisition of Mathematics concepts. Numeracy in ECE goes beyond basic counting and number recognition; it encompasses a broad range of mathematical abilities that form the basis for later mathematical understanding. This includes skills related to counting, sorting, comparing, and understanding numerical relationships, laying the groundwork for more advanced mathematical thinking National Association for the Education of Young Children (NAEYC) and National Council of Teachers of Mathematics (NCTM), 2020). In ECE, numeracy is integrated into play-based learning experiences, hands-on activities, and interactive strategies that cater for the developmental needs of young children. It aims to build a solid mathematical foundation by fostering a positive and engaging learning environment that sets the stage for a lifelong appreciation of mathematics.

Many early childhood teachers however, exhibit relative unconcerned or ignorant attitude towards children's pre-existing knowledge and constructivist perspective of learning, which are very vital in learning and helps to improve cognitive abilities. Maduewesi (2015) notes that teachers often introduce numeracy to the children through demonstration rather than involving them in the real activities. Children ought to be exposed early enough to hands-on approach to the learning of numeracy. The knowledge acquired using this approach during the early childhood education will help children construct knowledge out of their experiences and promote learning by doing which is the constructivist approach.

Constructivism is an approach to learning that enables people construct their own knowledge and understanding of the world, which is achieved through experiences and reflecting on those experiences. Constructivism is a learning theory based on observation and how people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences (Ekpenyong and Edokpolor, 2016). Constructivism is an approach to learning that puts emphasis on learner's activeness in establishing knowledge and comprehension. In this study, constructivist approach refers to the approach that enables pupils gain knowledge through the interaction of the environment. In upholding a constructivist numeracy classroom, the learners play active roles, this is to say that learning activities require the pupils' full participation (like hands-on experiments).

Constructivist classroom enables pupils to construct their own knowledge

through play, inquiry-based learning, cooperative learning, problem-based learning, demonstration method and so on. The teacher coaches, encourages, moderates, suggests, provides the pupils with real and meaningful problems but allows them the room to experiment, ask questions, try things that do not work and source out solutions. In a constructivist classroom, teachers are facilitators, assistant and guides rather than knowledge transmitters. This approach helps with the development of learners as individuals with ability to increase rational thinking and behaviour and create social skills and commitments. Constructivism approach gives room for varieties of instructional materials that enhances mathematics skills such as classification, seriation, numbers, time and spaces and which contribute to the acquisition of Mathematics concepts. The question now is how aware are teachers in the use of constructivist approach to teaching?

Early childhood teachers need to be aware of constructivist approach to employ same in teaching numeracy. Awareness is the state or ability to perceive, to feel, or to be conscious of events, object or sensory pattern (Gafoor, 2012). In other words, awareness refers to the public or common knowledge or understanding about social, scientific, educational, or political issues. Awareness is the state of consciousness where sense data can be confirmed by an observer. The constructivist approach to teaching emphasizes learner-centered learning, active engagement, and the co-construction of knowledge through hands-on experiences and social interaction. However, many teachers may not be aware of this approach, which can pose significant challenges to effective pedagogy in education. Teachers who are not aware of the constructivist approach may rely on traditional teaching methods, such as lectures and rote memorization, which prioritize passive learning and may not adequately engage learners in the learning process (Sunal, Hodges, Sunal and Whitakeral, 2021). Moreover, constructivist teaching strategies, such as inquiry-based learning, problem-solving activities, and cooperative learning, (Brooks and Brooks, 2023). may be underutilized or absent from classrooms where teachers lack awareness of their effectiveness (Brooks and Brooks, 2023). Without an understanding of constructivist principles, teachers may miss opportunities to actively engage pupils in meaningful learning experiences that promote critical thinking, creativity, and problem-solving skills (Jonassen, 2021). The constructivist approach emphasizes differentiation and scaffolding to meet the diverse needs of learners. However, teachers who are unaware of these principles may struggle to effectively support pupils with varying abilities, backgrounds, and learning styles (Tomlinson, 2019).

Teachers' awareness may be moderated by their location which can be rural or urban. Rural areas are known to be "usually" traditional in character and smaller than urban areas in size. It is usually referred to as villages and usually do not have much development in terms of infrastructure

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(Iwena, 2020). In this study, rural area refers to a less developed environment with limited opportunities for survival. Understanding the peculiar nature of rural areas in terms of educational provision is essential for developing effective strategies to address the unique challenges and opportunities facing rural communities. The peculiarity of the rural areas may make teachers susceptible to lack of awareness of constructivist approach to teaching.

On the other hand, urban areas are bigger in size and usually have more social amenities. Urban school is a school located within a settlement that transforms from a rural to urban character. It is characterized by increase in population and physical size, as well as increased economic activities (Iwena, 2020). In this study, urban area refers to area that is well developed with lots of infrastructural facilities and opportunities for better survival. Aguata, as a geographical entity is broadly grouped into rural and urban areas which also highlight inequality in infrastructural development between the two areas. It is the contention of the researcher that the root of all other inequalities lies in the discrimination between urban and rural areas in terms of provision of infrastructural facilities. In other words, there is imbalance in the distribution of necessary facilities between the rural and urban areas. As a result of this imbalance, more competent teachers drift from rural to urban areas in search for better opportunities (Okonkwo and Agwu, 2014). This may manifest in disparity in awareness of constructivist approach between teachers separated by rural and urban divide.

It has been observed however, that irrespective of location, many teachers at the early childhood education level employ approaches other than constructivist which suggests lack of awareness of constructivist approach. Lemma (2021) investigated teachers' awareness, attitude and practice of teaching primary school science curriculum towards constructivist approach, the findings revealed that teachers did not have the understanding of constructivist approach in-depth. Laska and Bhattacharjee (2022) studied teachers' awareness of constructivist approach and revealed that teachers were not aware of constructivist approach. In another study, Samba, Achor and Ogbeba (2020) found that the extent of awareness of constructivist approach among teachers was low. Though the studies have different focus from that of the present study, it indicates disparities that might exist across rural-urban divide. The study therefore is poised to determine teacher awareness of constructivist approach in teaching numeracy in early childhood education in Aguata L.G.E.A.

Statement of the Problem

The constructivist approach, rooted in the belief that children actively construct their understanding through hands-on experiences and social interactions, holds significant promise for fostering a deep and meaningful comprehension of numeracy among young learners. However, the effectiveness of this approach hinges on teachers' awareness, understanding, and

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incorporation of constructivist principles into their instructional practices.

It is observed however, that despite the recognized importance of a strong foundation in numeracy during the early years, there is limited empirical evidence regarding the extent to which teachers in Aguata Local Government Education Authority are aware of the constructivist approach. Teachers have continued to employ the traditional teaching method which involves the passive transmission of abstract, symbolic and existing mathematical structures to pupils, thus forcing them to adopt thinking structures developed by others which do not motivate pupils to get better results. These challenges may be connected to lack of the awareness of constructivist approach that will arouse the interest and curiosity of pupils.

It is uncertain if the teachers in early childhood education are aware of constructivist approach in teaching numeracy. There is therefore, the need to critically investigate teachers' awareness of the constructivist approach in teaching numeracy. It is on this premise that the study seeks to determine teachers' awareness of constructivist approach in teaching numeracy in early childhood education in Aguata Local Government Education Authority.

Purpose of the Study

The main purpose of this study was to determine teachers' awareness of constructivist approach in teaching numeracy in early childhood education in Aguata Local Government Education Authority. Specifically, the study sought to determine:

1. Rural and urban teachers' awareness of constructivist approach in teaching numeracy in early childhood education in Aguata Local Government Education Authority.

Research Question

This research question guided the study:

1. To what extent are rural and urban teachers aware of constructivist approach in teaching numeracy in early childhood education in Aguata LGEA?

Hypothesis

The hypothesis was formulated and tested at 0.05 level of significance:

Ho_1: There is no significance difference in the mean ratings of rural and urban teachers on the awareness of constructivist approach in teaching numeracy in early childhood education in Aguata LGEA.

Methods

This study was conducted to determine teachers' awareness of constructivist approach for teaching numeracy in early childhood education in Aguata Local Government Education Authority. One research question guided the study and one hypothesis was tested at 0.05 level of significance. Descriptive survey design was used for the study. The population of the study was 210 teachers in 70 ECEs schools in Aguata LGEA. Simple random

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sampling techniques was used to sample 10 schools and from the sampled schools, 100 teachers (comprising of 20 in rural and 80 in urban areas) were sampled. A 10-item structured questionnaire titled "Awareness of Constructivist Approach Survey" (ACAS) was constructed by researcher to generate data from respondents. ACAS is a 4-point rating scale that allows respondents to choose among four options namely, Very High Extent (VHE, 3.50-4.00), High Extent (HE, 2.50-3.49), Low Extent (LE,1.50-2.49) and Very Low Extent (VLE, 1.00-49). The ACAS was validated by three experts two from the Department of Early Childhood and Primary Education and one from Educational Foundations (Measurement and Evaluation Unit) all from Nnamdi Azikiwe University, Awka. Cronbach Alpha Reliability Coefficient was used. The reliability test yielded coefficient index of 0.88. Descriptive statistics (mean and standard deviation) were employed in analyzing the research questions while the t-test was used in testing the hypothesis at 0.05 level of significance.

Result

Research Question One: To what extent are rural and urban teachers aware of constructivist approach in teaching numeracy in early childhood education in Aguata LGEA?

Table 1: Rural and Urban Teachers' Awareness of Constructivist Approach in Teaching Numeracy in Early Childhood Education in Aguata LGEA.

		Rural Teachers			Urban Teachers		
S/N	**Awareness of constructive approach**	**X**	**SD**	**Decision**	**X**	**SD**	**Decision**
1.	I am familiar with the key principles of constructivism in education.	1.63	1.00	Low Extent	1.87	1.00	Low Extent
2.	I understand the role of prior knowledge in shaping pupils' learning experiences.	1.62	0.95	Low Extent	1.91	1.23	Low Extent
3.	I recognize the importance of social interaction in the learning process.	2.85	1.19	High Extent	3.14	0.91	High Extent
4.	I am aware of the Zone of Proximal Development (ZPD) and its relevance in teaching and learning.	1.36	0.71	Low Extent	1.79	1.03	Low Extent
5.	I understand the significance of active engagement in pupils' learning.	2.26	1.00	Low Extent	2.41	1.10	Low Extent
6.	I make use of hands-on-activities to teach numeracy	2.50	0.51	High Extent	3.12	0.63	High Extent
7.	I make use of inquiry-based learning in teaching numeracy	1.41	0.70	Low Extent	1.67	0.93	Low Extent
8.	I encourage peer tutoring where children take turns explaining numeracy concepts to each other	1.10	1.04	Very Low Extent	1.46	1.27	Very Low Extent
9.	I make use of manipulatives like counting blocks, stones among others to solve real-world problems	3.74	0.70	Very High Extent	3.96	0.88	Very High Extent
10.	Introducing numeracy concepts in contexts familiar to children	2.51	0.97	High Extent	2.98	0.81	High Extent
	Grand Mean	**2.09**	**0.87**	**Low Extent**	**2.43**	**0.97**	**Low Extent**

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Result in Table 1 above shows the mean and standard deviation scores of rural and urban teachers' awareness of constructivist approach in teaching numeracy among early childhood educators in Aguata LGEA. The analysis revealed that the respondents rated Items 1, 2, 4, 5, and 7 as Low Extent. Items 3, 6 and 10 as High Extent, Item 9 as Very High Extent and Item 8 as Very Low Extent. The grand mean for rural teachers shows 2.09 which indicates Low Extent. The grand mean for urban teachers shows 2.43 which also indicates Low Extent. This then means that early childhood teachers are to a Low Extent aware of the constructivist approaches to teaching numeracy in early childhood education. The standard deviation which ranged from 0.51 to 1.27 which is high indicates that the educators' responses are relatively heterogeneous.

Ho_1: There is no significance difference in the mean ratings of rural and urban teachers' awareness of constructivist approach in teaching numeracy in early childhood education in Aguata LGEA.

Table 2: t-test of Significant Difference in Rural and Urban Teachers' Awareness of Constructivist Approach in Teaching Numeracy in Early Childhood Education

Group	N	Df	X	SD	t-cal.	t-crit	Decision
Rural	20	98	2.09	0.87	1.552	1.96	Accept
Urban	80		2.43	0.97			

Table 3 shows the t-test of significance between rural and urban teachers' awareness of constructivist approach in teaching numeracy in early childhood education in Aguata LGEA. The calculated t-test value of 1.552 is less than the t-critical value of 1.96 at 0.05 level of significance and 98 degrees of freedom. The hypothesis therefore is accepted. Therefore, there is no significant difference in the mean ratings of rural and urban teachers' awareness of constructivist approach in teaching numeracy in early childhood education in Aguata LGEA.

Discussion of Findings

The findings of the study have shown that there is lack of awareness of constructivist approach to teaching numeracy among teachers in early childhood education in Aguata L.G.A. Teachers are not familiar with the key principles of constructivism in education, the role of prior knowledge in shaping pupils' learning experiences and the Zone of Proximal Development (ZPD) among others and its relevance in teaching and learning numeracy in early childhood education. The lack of awareness exhibited by teachers is consistent with earlier findings on teacher awareness. Findings are in agreed

with that of Laska and Bhattacharjee (2022) who posits that teachers are not aware of constructivist approach. The findings are also in consonance with that of Samba, Achor and Ogbeba (2020) who posits that the extent of awareness of constructivist approach among teachers was low. The consistency of findings on poor awareness of constructivist approach to teaching numeracy among early childhood teachers has serious implications for teaching at that level. A strategy to address this gap therefore, is important for effective teaching and learning of numeracy.

The finding also shows that there is no significant difference in the mean ratings of rural and urban teachers' awareness of constructivist approach in teaching numeracy in early childhood education in Aguata LGEA. There is indication that although both teachers in the rural and urban areas have low awareness of constructivist approach, teachers in urban areas show better awareness of the approach than their counterparts in the rural areas. The findings of the study agreed with earlier findings of Ali, Iqbal, Hassan, Ahmad, Masaud, Akram, (2015) who posits that urban primary school teachers have more awareness than the rural primary school teachers. In another study, Afolabi (2019) established that Mathematics teachers in urban areas are moderately aware of research findings on Mathematics education than their rural counterparts. Though the studies have different focus from that of the present study, it indicates disparities that exist between the rural-urban divide.

Conclusion

Early childhood education (ECE) plays a pivotal role in shaping the foundation of a child's cognitive, social, emotional, and physical development. Adoption of constructivist approach is vital in providing children at this level the necessary learning experience. Constructivist approach is importantly particularly in teaching numeracy. The findings of this study however, have shown that teachers have low awareness of this approach in teaching numeracy in ECE. There is the need therefore for all concern to assist teachers in acquiring the necessary knowledge and skill for proper utilization of constructive approach in teaching numeracy in ECE.

Recommendations

In view of the finding, the following recommendations were made:

1. Teachers should be provided with in-service training, seminars, conferences and workshop on the constructive approach to teaching numeracy in early childhood education by Anambra State Universal Basic Education Board (ASUBEB).
2. Anambra State government should provide adequate resources for early childhood education teachers in urban and rural areas to practice constructive approach in teaching numeracy.

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