Impact of Quality Control on Teaching and Learning of Mathematics in Early Childhood Education

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Abstract
This study examined the impact of quality control on teaching and learning of mathematics in Early Childhood Education. The study adopted the descriptive survey research design. One hundred (100) nursery and primary school teachers were randomly selected from all the primary school teachers in Akinyele Local Government Area of Oyo state. An instrument titled "Impact of Teacher Supervision and Efficiency on Teaching and Learning of Mathematics Questionnaire" (ITSETLM) with reliability coefficient of 0.70 was used for data collection. Two hypotheses were tested and data were analysed using Pearson Product Moment Correlation Coefficient at 0.05 level of significance. The findings revealed that there is a significant relationship between teachers' supervision and teaching and learning of Mathematics in Early Childhood Education, it also revealed that there is significant relationship between teachers' efficiency and teaching and learning of Mathematics in Early Childhood Education. Based on the findings, it is recommended that: Professional teachers with sound qualitative basic pedagogical teaching methodologies and skill should be recruited in the Nigerian pre-school teaching; adequate and functional supervisory unit should be provided to monitor teaching and learning of mathematics in pre-school.

Keywords: Quality control, teacher supervision, teacher efficiency, Early Childhood Education

Introduction

Education is a lifelong process that exempts only the non-living. No country can develop adequately without proper education for its citizens. The development of a country is measured in line with quality of education of its citizens. Education is the only solution to societal problem (Ilufoye, 2018). Amosun (2014) describes education as a means by which we acquire relevant knowledge, skills and increase capacity for work which is required for development. Obanya (2016) also opines that education is an instrument for preparing the young generation for self-actualization through the acquisition of requisite employability skills. According to Oduolowu (2011), early childhood education is an essential component of family and programme arrangements for young children from birth to the statutory school age of six. According to National policy on education (2013), early childhood education includes the crèche, the nursery and kindergarten. It is fundamental to a child's overall development and the child's later educational achievements and future success. Early childhood education and primary education in Nigeria serves as the foundation of further education and has the following goals: development of the individual into a morally sound, patriotic and effective citizen;
total integration of the individual into immediate commonly, the Nigerian society and the world; provision of equal access to qualitative educational opportunities for all citizens at all levels of education, within and outside the formal school system; inculcation of national

consciousness, values and national unity and development of appropriate skills, mental, physical and social abilities and competencies to empower the individual to live in and contribute positively to the society (NPE, 2013).

Mathematics is generally accepted as an important subject and a pillar upon which science and technology stand. This implies that if there is no mathematics there would be no science and technology. Today science and technology has become a yardstick through which the economic power and development of any country in the world can be measured. In view of this, a country with advance science and technology is considered a developed country. However, these cannot be achieved without mathematics (Muhammed & Bashar, 2017). Throughout the early years of life, children notice and explore the mathematical dimensions of their world; they compared quantities, find patterns, navigate in space and grapple with real problems such as balancing building blocks or sharing a bowl of crackers fairly among playmates. Mathematics helps children to make sense of their world outside of school to construct a solid foundation for success in school (National Association for the Education of Young children, 2010). Excellence in mathematics education requires equally high expectations and strong support for all pupils. A curriculum is more than a collection of activities; it must be coherent, focused on important mathematics, and well-articulated across grades. Effective mathematics teaching, therefore, requires understanding what pupils know and need to learn while also challenging and supporting them to learn it well. Pupils must learn mathematics with understanding and actively build new knowledge from experience and prior knowledge. According to National Association for the Education of Young Children "NAEYC" (2010), assessment should support the learning of important mathematics and furnish useful information to both teachers and pupils. Teachers are vital to helping pupils attain mathematics excellence.

The Federal Government of Nigeria in the National Policy on Education (2013), "specifically stated that teaching shall be practical activity-base, experimental and child-centre". To this end, mathematics teachers should make teaching and learning of mathematics engaging by using concrete materials, picture and diagrams among others. More so for pupils to become proficient in mathematics for scientific and technological development, they require a level of numeracy literacy that involves understanding of elementary mathematics and capacity to apply it to solving problems (Muhammed & Bashar, 2017).

Nigerian Educational Research and Development council indicated five strands at which proficiency can be attained. They are: Conceptual understanding i.e. comprehension of mathematical concept, operation and relations; procedural fluency which involves skills in carrying out procedures flexibly, accurately, efficiently and appropriately, strategic competence that is, the ability to formulate, represent and solve mathematical problems, adaptive reasoning- the capacity for logical taught, reflection and justification, productive disposition-habitual inclination to see mathematics as sensible, useful and worldwide, coupled with a belief in diligence and one's own efficacy.

Quality control is the collection of policies, systems, procedure, and practices internal and external that the organisation intends to achieve and maintain in order to enhance process and output fulfil expectations. It is the engineering activities implemented in a quality system so that requirements for a product of service will be fulfilled (Ilufoye, 2018). In Nigeria, the Federal government sets the minimum standard to follow and achieve in terms of policies, guidelines and aims. To achieve this, agencies are put in place across the federation and saddled with the set standards in order to bring about improvement in teaching and learning in the foundational levels. The following eight components constitute

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the quality standards set by the Nigeria Government which both levels of education must strive to provide, maintain and achieve. They are:

1. learner's achievement and standards,
2. learners' welfare and participation relationship,
3. care, guidance and support,
4. leadership and management,
5. school community relationship,
6. learning environment,
7. teaching and learning and curriculum and other activities (FGN,2013).

According to Amosun (2014), the Nigerian quality standards are similar to those in the developed countries of the world like Australia where seven national quality standards are set; they are: education programme and practice, children's health and safety, the physical environment, staffing arrangement, relationship with children, collaborative partnerships with families and communities, and leadership and service management. The implication of the above mentioned standards is that for quality control to be attained in education to be given to Nigerian children, all the policies, procedures, practices should be imbibed, utilised, achieved and maintained (Ilufoye, 2018).

Supervision connotes the processes adopted for the purpose of improving achievement in mathematics through teachers continuous development and curricula and instructional innovation. Supervision whether democratic, authoritative, idiographic, homothetic or clinical should be viewed as a means of improving or raising the standards in mathematics teaching and learning (Olubusuyi, 2014). Similarly, Olubusuyi (2014) asserted that a mathematics supervisor is an excellent resource person with a wealth of experience, knowledge and ability in the professional development of mathematics teachers. The mathematics supervisor is a help giver, a tolerant individual and has a potential for creativity in mathematics teaching and learning. The mathematics supervisor is not a boss but a 'learner' in the development of mathematics learning materials, curricula and instructional processes which ultimately enhance effective teaching and better achievement in mathematics. The supervisor is familiar with the school situation, aware of many problems that teachers face and willing to help. The mathematics supervisor has a definite obligation to visit mathematics classrooms in order to help mathematics teachers develop professionally.

The following are considered the major focus of the mathematics supervisors: conducting of an orientation session for newly recruited mathematics teachers; provision of curricula guides provision of instructional guides in form of materials needed for effective teaching and learning; provision of information on the selection of mathematics textbooks and where to get them; evaluation of mathematics teachers' teaching and the provision of feedback via conferences for the teachers; assistance to teachers in the teaching of topics perceived as difficult; organisation of in-service education for teachers; encouraging teachers to join professional association for their professional growth (e.g. The Mathematical Association of Nigeria) and suggestion of welfare package to government for mathematics teachers. By and large, there is no doubt the quality control is a vital tool to achieving qualitative and quantitative education on the teaching and learning of mathematics in early childhood education.

Statement of the Problem

Evidence through literature search have shown that there is dare need of quality control in the teaching and learning of mathematics in pre-school because it is basis upon

which all other levels of education is built. Several variables have been suggested to be responsible for this trend. Inadequacy in teacher supervision and teaching, inadequacy in teacher efficiency and teaching, problem in the learning of mathematics and problem of teaching early childhood education. Therefore, this call for the use of instructional strategy, quality materials and teacher that are both sound academically and morally that will enhance pupils' performance in the subject matter. It is against this backdrop that this study strongly sought to investigate the impact of quality control on the teaching and learning of mathematics in early childhood education.

Research Hypotheses

The following null hypotheses were tested in the study:

Ho$_1$: There is no significant relationship between teacher supervision and teaching/learning of Mathematics in early childhood education.

Ho$_2$: There is no significant relationship between teacher efficiency and teaching/learning of Mathematics in early childhood education.

Methodology

The research design adopted for this study is descriptive survey method. The descriptive survey method was employed because it will describe systematically the facts and the opinion of a given sample in the area of interest, conclusion and generalisation can be made on contemporary issue. The population comprised all the primary school teachers from Akinyele Local Government Area of Oyo State. Simple random sampling technique was used to select one hundred (100) pre-primary school teachers from Akinyele Local Government Area of Oyo State. The instrument used was researchers' constructed questionnaire on Impact of Teacher Supervision and Efficiency on Teaching and Learning of Mathematics in Early Childhood Education. It was divided into two sections. Section A elicited information on the personal data of the respondents i.e. demographic data such as sex, age, qualification and years of teaching experience while Section B has two parts comprising twenty (20) items graduated on a four-point rating scale. Each part has ten (10) items. The instrument was validated by specialist in the field of Measurement and Evaluation. After vetting, some items were added while some were restructured. The reliability was established through test re-test method, which result to a reliability coefficient 0.70. The statistical procedure employed for analysing the data collected in the study was Pearson product moment correlation coefficient.

Results

Ho$_1$: There is no significant relationship between teacher supervision and teaching/ learning of mathematics in Early Childhood Education

Table 1: Correlation of Teacher Supervision and teaching/learning of mathematics in Early Childhood Education

Variables	Number	Mean	S.D	r-cal	r-crit	Remark
Supervision	100	62.05	10.32			
Teaching and learning of mathematics	100	41.72	11.41	1.24	0.185	**

From the analysis in Table 1, the correlation analysis revealed that, r-cal value 1.241 is greater than r-tab value of 0.185 at 0.05 level of significance, since the calculated value 1.24 is greater than the table value of 0.185, the null hypothesis which stated that "there is no significant relationship between teacher supervision and teaching/learning of mathematics in Early Childhood Education" is hereby rejected. Therefore, an alternative

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hypothesis that states that "there is a significant relationship between teacher supervision and teaching/learning of mathematics in early childhood education is hereby adopted. This implies that teachers' supervision has implication on the teaching/learning of mathematics in early childhood education.

Ho2: There is no significant relationship between teacher efficiency and teaching/ learning of mathematics in Early Childhood Education.

Table 2: Correlation of Teacher Efficiency and teaching/learning of mathematics in Early Childhood Education

Variables	Number	Mean	SD	r-cal	r-crit	Remark
Teachers efficiency	100	54.07	12.41			
Teaching and learning of mathematics	100	48.24	10.25	1.352	0.185	**

From the analysis in Table 2, the correlation analysis revealed that, r-cal value 1.352 is greater than r-tab value of 0.185 at 0.05 level of significance, since the calculated value 1.352 is greater than the table value of 0.185, the null hypothesis which stated that "there is no significant relationship between teacher efficiency and teaching and learning of mathematics in early childhood education" is hereby rejected. Therefore, an alternative hypothesis which states that "there is a significant relationship between teacher efficiency and teaching and learning of mathematics in early childhood education is hereby adopted. This implies that teacher efficiency has influence in the teaching and learning of mathematics in early childhood education.

Discussion of Findings
Teacher Supervision, Teaching and Learning of Mathematics in Early Childhood Education
The findings of this study revealed that there is significant relationship between teacher supervision, teaching and learning of mathematics in early childhood education. This finding is in consistent with that of Olubusuyi, (2014) which emphasised that supervision is a means of improving and rising of standards in mathematics teaching and learning. In view of this, mathematics supervisor should visit mathematics classrooms in order to help mathematics teachers develop professionally, have the knowledge and ability in the professional development of mathematics teachers and organise in-service training for teachers to equip them with instructional processes which enhance effective teaching and better achievement of pupils in mathematics.

Teacher Efficiency and Teaching and Learning of Mathematics in Early Childhood Education
The study also showed a significant relationship between teacher efficiency and teaching and learning of mathematics in early childhood education. This result is in line with the findings of Ilufoye, (2018) who asserted that for quality control to be attained in education to be given to Nigeria children, all the policies, procedures and practices should be imbibed, utilised, achieved and maintained. Also, mathematics teachers should make teaching and learning of mathematics interesting and engaging by using concrete materials, picture and diagrams to teach mathematics in early childhood for pupils to become proficient in mathematics for scientific and technological development.

Conclusion

This study established that there was correlation between teacher supervision and teaching and learning of mathematics in early childhood education. It also established that there is relationship between teacher efficiency and teaching of mathematics in early childhood education.

Recommendations

Based on the findings of this study, the following recommendations were offered:

1. The stakeholders of education need to provide enabling environment for children to exhibit their latent abilities.
2. Modern methods and approaches should be adopted in the supervision of instruction in mathematics classrooms.
3. Professional teachers with sound qualitative basic pedagogical teaching methodologies and skill should be recruited in the Nigerian pre-school teaching.
4. There is high need for training and re-training of pre-school teachers through seminars, workshops and in-service training in conformity with best world standard.
5. Adequate and functional supervisory unit should be provided to monitor teaching and learning of mathematics in pre-school.
6. Government should make sure that better attractive working conditions are provided for teaching and learning of mathematics to effectively take place in classroom.

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