

Assessment of Availability and Utilization of Instructional Materials for Teaching Preschool Children with Hearing Impairment Mathematics in Oyo State, Nigeria

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Abstract

This study examined the assessment of availability and utilization of instructional materials for teaching preschool children with hearing impairment mathematics in Oyo State, Nigeria. The instrument was Instructional Materials for Teaching Preschool Children with Hearing Impairment Mathematics Questionnaire (IMTPCHIPQ). A twenty-eight item/questionnaire divided into two sections was used to elicit information from the teachers on how to provide availability of and utilization of instructional materials in teaching mathematics to preschool children with hearing impairment. The population of the study consisted of all the teachers of hearing-impaired children in preschools in Oyo State, Nigeria. Sample size of 120 teachers was purposively selected special public primary schools. Data were analyzed using frequency counts means and percentages. Results showed that instructional materials for teaching and learning of Mathematics for preschool children with hearing impairment are not available. The results also revealed that mathematics teachers rarely utilize instructional materials in teaching mathematics to preschool children with hearing impairment. The implication is that the use of instructional materials is inevitable if effective teaching and learning must be achieved. Finally, the study revealed that unavailability of instructional materials; poor knowledge of teachers on improvisation of instructional materials and overpopulation of pupils in the classroom are some of the challenges hindering the effective use of instructional materials. Based on the findings, it was recommended that Mathematics teachers must make use of instructional materials frequently during mathematics instruction; teachers should be ready to improvise some of the needed materials for the teaching of Mathematics; the special needs Education officer should do regular supervision concerning education of children with hearing impairment not leaving out the issue of instructional material adaptation and the Head teacher should give priority on issues concerning materials required in the adaptation of instructional materials for learners with hearing impairment.

Keywords: Instructional Materials, Preschool, Children and Mathematics.

Introduction

The Federal Republic of Nigeria (2013) in her National Policy on Education recognizes education as an instrument par excellence for effecting national development. For education to actually serve its real purpose of societal transformation, the indispensable components of such education must include quality infrastructure in the form of conducive

and adequate classrooms, quality instructors (teachers) at all levels who are highly motivated and plus relevant instructional materials, and curriculum (Nnabugwu, Onwuka & Ugwude, 2020). To get the required result in education, there is the need for the society to lay a strong foundation at the early childhood level of education. This foundation should therefore be centered in the early development of the children. Early childhood education (ECE) is the education given in an education institution to children prior to their entering into the primary school. The early years are crucial for the development of an individual. It is the foundation for the success or failure of the whole system of education and any support given at this stage with appropriate practice helps to promote development (FRN 2013).

There was a time in the Nigeria educational system when there was no curriculum for children in early childhood education, children were taught based on the proprietors' initiative. Children were just sent to school to stay and wait for the parents or guardian to come back from their daily activities and pick them up. Recently as a result of modernization and globalization, early childhood curriculum came forth. With recent researches, it was found that 0-6 years is a critical period in the life of any child. The brain at this point develops faster than ever (Nnabugwu, Onwuka & Ugwude, 2020). Anything that the child learns here affects the Childs adulthood. As a result of this, it became important that children need to be provided with stimulating, friendly and safe environment.

Preschool children with hearing impairment are those with a loss in hearing whether permanent or fluctuating. Some children may have a hearing loss which is so severe that it completely precludes perception and interpretation of spoken language. Others may have mild or moderate hearing loss which permits perception and processing of spoken language although with difficulty (Sandbox, 2017). This implies that the existence of hearing loss may hinder children with this condition from participating in learning activities. Children with hearing impairment continue to lag behind their peers in academic achievement especially in the areas of reading and mathematics. Nakayiza (2019) indicates that the gap in achievement between children with normal hearing and those with hearing impairment usually widens as they grow older.

Children with hearing impairment are members of the human race. What is best for others is best for those with hearing impairment too (Nakayiza, 2019). They have, like everyone else, rights and talent which nature has bestowed upon them. These talents need to be nurtured and their rights respected. One of these rights is a right to education (UN, 1948). The Dakar Framework for Action on Education states in its fundamental principle that; "the learning needs of persons with disabilities demand special attention. It adds that steps need to be taken to provide equal access to education to every category of disabled person as an integral part of the education system (UNESCO, 1994). All these International documents submit the right to education for people with disabilities as a fundamental freedom. In many countries, children with hearing impairments face a lot of challenges in accessing education. In South Africa, children between the ages of 8-15 face challenges of inadequate resources and materials to cater for their education. In Mozambique, almost 3/10 children

mostly girls with hearing impairments are out of primary education. This indicates low access to education among these children, a factor which could be associated with lack of adequate instructional materials (Nakayiza, 2019). In Uganda, there is a well-established policy to cater for the education of children with disabilities for example those with hearing impairment. Literacy and numeracy are viewed as fundamental human right and the foundation for lifelong learning. It is fully essential to social and human development in its ability to transform lives (UNESCO, 2017). This study therefore assessed availability and utilization of instructional materials for teaching preschool children with hearing impairment mathematics in Oyo State,

Mathematics is a branch of science that can always be learned by every child and in formal institutions; mathematics lessons are always available at every level of education from kindergarten to university, both in public schools and in special schools or special schools (Rusyani, Ratnengsih, Putra, Maryanti, Al Husaeni & Ragadhita, 2022). Mathematics lessons should be introduced as early as possible because mathematics is one of the subjects that are useful for human life (Rusyani et al, 2022). Studying mathematics requires ability in abstract understanding, because it is related to number symbols and also mathematical symbols and children with hearing impairment have difficulties in learning mathematics which can be said that it is natural because general students in regular schools also have difficulty in learning mathematics (Rusyani et al, 2022). Meanwhile, preschool children with hearing impairment learning mathematics is no less important than studying other subjects, but there are many obstacles faced by children in learning mathematics. The difficulty of preschool children with hearing impairment in learning mathematics is broadly divided into two parts, namely difficulties that come from within the child and difficulties that come from outside the child (Rusyani et al, 2022). In preschool children with hearing impairment, this difficulty is related to the inability of preschool children with hearing impairment to obtain information through the sense of hearing so that they have difficulty using language and speech which has an impact on the difficulty of using language for academic purposes. Functionally, the development of preschool children with hearing impairment is influenced by language skills, so the intelligence development of student with hearing impairment is hampered (Rusyani et al, 2022).

Mathematics is an important element in human life. Human beings use it daily as a tool to facilitate their life. As a result of its significant value, teaching and learning of mathematics should be approached in ways that help learners develop positive attitude towards it (Mueni, 2019). This helps children from an early age to believe that, mathematics is part of life and that it makes life easier. Major problems in development of positive attitude towards mathematics in early years of preschool may come in when learners start dropping out of school and others being forced to repeat classes (Mueni, 2019). The major contributing factor to this crisis is lack of appropriate instructional materials (IM) to help maximize the benefits to learners during mathematics instructions. Such IM are, for example, printed instructional media, non-print instructional media and concrete materials.

Major problems in development of positive attitude towards mathematics in early years of primary school may come in when learners start dropping out of school and others being forced to repeat classes while the major contributing factor to this crisis is lack of appropriate instructional materials (IM) to help maximize the benefits to learners during mathematics instructions. Such IM are, for example, printed instructional media, non-print instructional media and concrete materials (Mueni, 2019). appropriate instructional media are resources that help teachers and learners in making teaching and learning more real. They help in making permanent concepts in learners' minds. He added that use of IM solves teaching and learning problems from pre-primary level to college level and In addition, utilization of appropriate IM helps the teachers in complementing their work and getting feedback from their clients, during and after learning activities. More so, they help teachers achieve the set objectives of their subjects (Mueni, 2019). This then implies that instructional resources make teaching and learning process complete and functional.

Studies conducted in developed countries like United States of America (USA), Europe, Uruguay among others revealed that, use of IM in teaching and learning mathematics is embraced. For instance, a study on strategies for improving mathematical instructions for students in short-term facilities in Washington DC, USA showed that learners' engagement in mathematics activities and learning was influenced by the inclusiveness of the classroom environment. An inclusive classroom environment enabled active participation of the learners. This meant that a variety of instructional materials was an ingredient. Use of instructional materials promoted their willingness to engage in the classroom activities the researchers also noted that use of instructional materials helped learners display positive attitude towards classroom activities, create favorable learning conditions and engage learners in the activities. It also enabled them have interest in this area and develop curiosity in wanting to learn more (Mueni, 2019). In third world countries, especially African countries, studies show that utilization of IM in the teaching and learning process has been embraced and its impact is evident. Studies also revealed that due to utilization of appropriate improvised instructional materials, acquisition of mathematical concepts improved thus improving their mean achievement score (Mueni, 2019). This may be due to the fact that improvised IM brought about competitiveness and enlivened learning for learners which may also implies that inadequacy of teaching resources contributed to low quality of education. Appropriate IM should be used during the teaching and learning process to promote active understanding and not rote learning while Absence of adequate, appropriate IM would encourage passive learning. IM brings joy to teachers and enthusiasm to learners. Teaching and learning resources (TLR) help both teachers and learners in self-discovery. They promote child-centered approaches of teaching and learning through learner participation, (Mueni, 2019).

Use of Instructional resources in teaching science and mathematics is vital in improving the academic achievement of the young children. A study revealed that teaching and learning resources not only enhances a Child's acquisition of science and mathematics skills but also ensures good and smooth transition from preprimary to primary school (Ayiema, 2019). It

has also been observed that the teacher is the major driving source of instructional resources and he/she has to influence children and parents to provide or collect the teaching and learning resources to use during the mathematics and science activities. Ayiema, further adds that teaching and learning resources can be made available by parents and the community as a whole for the ECDE centers within the locality. This can be successfully done by organizing for material development day in school. The community members and parents can collect and others can donate to the school, meet and share thus encouraging early enrolment and learn to provide learning resources. It is important to adapt instructional materials bearing in mind the learners' interests, preference and needs and give appropriate guidance throughout the learning says that a person who has lived with a hearing impairment from birth is often cut off from the usual form of communication. Therefore, Teachers are advised consider the potential variation in the individual's skills, learning styles and preferences. Teachers teaching children with hearing impairment, have a duty to adhere the principals of proper multimedia adaption that best utilizes cognitive processes within the working memory (Nakayiza, 2019).

Theoretical Framework

This study employed Jerome Bruner's learning theory framework which was drawn from Bruner work in 1966. Bruner described his developmental human psychology in early childhood that pre- primary school children think and reason about their environment through learning, Bruner show pre scholars as being active in the process of learning by manipulating their environment. Bruner was very much opposed to the expectations of the passive learner which automatically associating stimulating responses. This theory is called learning theory by Bruner (1966), he developed three modes of learning by young children in order to effectively enjoy learning process: namely enactive representation-where children manipulate objects and iconic - children represents internal objects on visual and image or icons and symbolic representations of external objects into words, formulas or other symbolic means among children.

Bruner's learning theory is related to the current study examined the assessment of availability and utilization of instructional materials for teaching preschool children with hearing impairment mathematics in Oyo State, Nigeria. The theory also explains the basis of discovery learning which was realized during the study. And usually the discovery method is through the use of instructional resources which children enjoy to use. According to Bruner any child can be ready and able to learn anything if he is taught intellectually and in an honest fashion, young children understand complex concepts if they are talked in the mode of representation that corresponds them accordingly this will only be done through the use of instructional resources which matches with Bruner's three major learning process that is enactive, iconic and symbolic representations. This was merely the appropriate use of instructional resources in teaching especially mathematics in young children with hearing impairment.

Empirical Studies

A recent study by Suarsana, Mahayukti, Sudarma & Pujawan (2019) examined whether the Interactive Mathematics Learning Media (IMLM) has a positive effect on hearing-impaired students' mathematical conceptual understanding (MCU) on probability. This research applied an experiment with post-test only control group design in which 36 students got involved. The intervention at the experimental group was learning assisted with IMLM. A descriptive approach of the qualitative phase was done toward some respondents which were selected purposively on the population. The MCU data was collected using an essay test. The MCU data were analyzed using one-tailed of t-test with the significance level of 5%. The result showed that using IMLM has a significant effect on students' MCU. Students in the experimental group were more motivated, more involved in learning because IMLM has accommodated their special needs namely the principle of facial orientation and visual representation compared with those in the conventional learning. The current study examined the assessment of availability and utilization of instructional materials for teaching preschool children with hearing impairment mathematics in Oyo State, Nigeria.

A study was conducted by Yusuf & El-Yakub (2020) investigated the availability, utilization and management of ICT facilities in teaching English language in secondary schools in Kaduna State, Nigeria. The study adopted a descriptive survey research design. A questionnaire titled "Availability, Utilization and Management of Information and Communication Technology in teaching English Language in Secondary Schools" (AUMICTSS) was used for data collection. Twenty randomly selected secondary schools from Kaduna metropolis were used for the study. A total of 100 teachers participated by responding to the items on the questionnaire. The data collected was analysed using frequencies and percentages. The findings of the study revealed that there is a dearth of ICT facilities in secondary schools in Kaduna as there are only very few of such facilities available in most of the schools visited. It also revealed that most teachers were not competent in the use of these facilities as the management of these facilities requires training and re-training. It was recommended as a matter of urgency that government should provide more ICT facilities in schools and ensure the provision of electricity in every secondary school for optimal utilization of these facilities. Teachers should equally be trained and re-trained regularly in the use and management of ICT facilities for effective English Language curriculum delivery. The current study examined the assessment of availability and utilization of instructional materials for teaching preschool children with hearing impairment mathematics in Oyo State, Nigeria.

Another study by Osman, Oracha and Joel (2020) examined the Assessment of availability and Use of Teaching and Learning Resources for Retention of Learners with Special Needs in Regular Primary Schools in Dadaab Sub-County, Kenya. The purpose of the study was to assess the status of implementation of inclusive education practices for the retention of learners with special needs in regular primary schools in Dadaab subcounty. The specific objective of the study was to establish the extent to which the availability and use of teaching and learning resources affect the retention of learners with special needs in regular

primary schools in Dadaab sub-county. The study adopted a descriptive survey research design. The target population comprised 26 head-teachers, 78 teachers, 300 learners with special needs, and 4 education officers. Saturated sampling technique was used to select 23 head-teachers, 70 teachers, 100 learners with special needs, and 4 education officers. Instruments for data collection were questionnaires, interview schedules and observation schedules. Quantitative data were analyzed using frequency counts, percentages, and mean. The findings of the study indicated that the availability and use of teaching and learning materials were inadequate (mean= 2.18). The study concluded that the low retention of learners with special needs as a result of the availability and use of teaching and learning materials to a small extent. The study recommended that the country and national government should ensure that there is adequate provision of teaching and learning resources to enhance learning for learners with special needs. The budget for materials should be enhanced. The study also recommends to non-governmental organizations to assist regular primary schools to access teaching and learning materials that can be used by learners with special needs. The current study examined the assessment of availability and utilization of instructional materials for teaching preschool children with hearing impairment mathematics in Oyo State, Nigeria.

Nnabugwu, Onwuka & Ugwu (2020) investigated the availability and utilization of instructional material in the implementation of early childhood literacy curriculum in public schools in Orumba South L.G.A, of Anambra State. Two research questions guided the study. The design was a descriptive survey. The population comprised of 110 pre-school teachers. A sample of 50 pre-school teachers were drawn using simple random sampling techniques. Instrument for data collection was a questionnaire which was developed by the researchers. The instrument was validated by three experts. The reliability of the instrument was determined using Cronbach Alpha Reliability Coefficient which yielded a value of 0.60 and 0.70 with an overall reliability of 0.65. Data collected were analyzed using percentage, mean and standard deviation. The major findings were: that some of the instructional materials were not available for in the implementation of early childhood literacy curriculum and that teachers do not use some of the instructional materials. In conclusion, the teacher does not use instructional materials which would have helped them for gain information's, think, recall and also assimilate what they have been taught. These hinder the implementation of early childhood literacy curriculum. Based on these findings, recommendation was made: The State Government and Parents Teacher Association (P.T.A) should join hands in providing instructional materials in early childhood education. Workshops and seminars should be organized at times to re-train teachers on how to use instructional materials. The current study examined the assessment of availability and utilization of instructional materials for teaching preschool children with hearing impairment mathematics in Oyo State, Nigeria.

Statement of the Problem

The contributions that mathematical knowledge and skills have made to economic, industr-

rial and technological growth of modern world are quite obvious to almost everyone. It enters into all areas of human activities. Nigeria has made mathematics a requirement for both primary and secondary school pupils to provide a solid foundation for critical and scientific thinking and prepare students for higher education. Nevertheless, some pupils lack appropriate mathematical knowledge, abilities, and concepts. Among other degree programs, any main course, such as medicine, architecture, and engineering, uses mathematics as a fundamental entry prerequisite. Despite the significance of mathematics in society, students have performed poorly on national exams in this subject. Several factors have been attributed to poor performance in mathematics, including poor teaching methods, poor interest in mathematics, and the absence of appropriate teaching resources across all educational. Hearing impairment may hinder a child from learning and participating in curricular activities in schools. In light of this, there is increased advocacy for adaptation of instructional materials for learners with hearing impairment nationally and internationally. This development is based on the perception that instructional materials for learners with hearing impairment enhance the learning of this category of learners. However, the use of instructional materials in teaching and learning mathematics to children with hearing impairment has not received the necessary attention desired in early childhood education. Where there were instructional materials, pupils learn a lot because they see, touch and feel. These concerns motivated the researchers to carry out this study on the assessment of availability and utilization of instructional materials for teaching preschool children with hearing impairment mathematics in Oyo State, Nigeria.

Objectives of the Study

The following were the objectives that guided this study:

1. To identify the available instructional materials for the teaching and learning of Mathematics preschool children with hearing impairment in Oyo State.
2. To ascertain how often do mathematics teachers use instructional materials to teach mathematics in preschool children with hearing impairment in Oyo State?
3. To examine the challenges hindering effective use of instructional materials for the teaching of mathematics in preschool children with hearing impairment in Oyo State?

Research Questions

The following research questions were posed to guide this study:

1. What are the available instructional materials for the teaching and learning of Mathematics preschool children with hearing impairment in Oyo State?
2. How often do mathematics teachers use instructional materials to teach mathematics in preschool children with hearing impairment in Oyo State?
3. What are the challenges hindering effective use of instructional materials for the teaching of mathematics in preschool children with hearing impairment in Oyo State?

Research Design

The study adopted a survey type of descriptive research design. The design is found suitable for the study since it involves the gathering of data about the sample of population which was organized, tabulated, depicted and described and described the variables of study.

Sample and Sampling Technique

The study population comprised all the public preschools teachers teaching hearing impairment children in Oyo State. One hundred and twenty (120) preschools teachers purposively selected as respondents for the study from the three senatorial districts of Oyo State.

Research Instrument

The instrument for this study was adopted from Oni (2019). The instrument was Instructional Materials for Teaching Preschool Children with Hearing Impairment Mathematics Questionnaire (IMTPCHIPQ). A twenty-eight item/questionnaire divided into two sections was used to elicit information from the teachers on how to provide availability of and utilization of instructional materials in teaching mathematics to preschool children with hearing impairment. Section A elicits information in the area of classroom environment and provision and teaching and learning. Section B elicits information in the area concerning availability of and utilization of instructional materials in teaching mathematics to preschool children with hearing impairment. Research question one was instrument was constructed on a 2-point rating scale of Available (A) and Not Available (AV). Research question two was instrument was constructed on a 4-point rating scale of Always (A), Sometimes (S), Rarely ® and Never (N). Research question three was instrument was constructed on a 2-point rating scale of Agree (A), Disagree (D). The research was carried out with some research assistants in administering the instruments.

Validity and Reliability of the Instrument

The instrument after constructions was given to experts in the field of early childhood education and educational evaluation to critique. Their various suggestions were thus incorporated into the final draft of the questionnaire. This is to ensure the face validity of the instrument. The questionnaire was validated using the K-R 21 Formula; a reliability of 0.86 was gotten. The research instrument was therefore valid and highly reliable.

Procedure of Data Collection

The researchers administered the instrument with the help of fifteen research assistants. The researchers and the research assistants ensured proper completion of the instrument after which they were collected immediately to avoid loss or interference.

Method of Data Analysis

Data were analyzed using means and percentages

Data Analysis

Research Question 1: What are the available instructional materials for the teaching and learning of Mathematics of preschool children with hearing impairment in Oyo State?

Table 1: Availability of Instructional Materials for the Teaching Mathematics in Preschools

S/NO	Items	N	Available	%	Not Available	%	Remark
1	Construction/ Drawing Instrument	120	40	33	80	67	Not Available
2	Measuring Tape /Ruler	120	43	46	77	64	Not Available
3	Charts/ Diagram	120	31	26	89	74	Not Available
4	Cardboard	120	27	22	93	78	Not Available
5	Mathematics Aquarium	120	14	10	103	86	Not Available
6	Mathematical Sets	120	52	43	68	57	Not Available
7	Shapes	120	46	38	74	62	Not Available
8	Concrete Object	120	43	36	77	64	Not Available
9	Projector	120	26	22	94	78	Not Available
10	Chalkboard	120	71	59	49	41	Available

Source: Field survey (2023)

Results

Results in table 1 revealed that 67% of the respondents agreed that the construction/ drawing instrument are not available. 64% of the respondents agreed that the charts/ diagrams are not available. 64% of the respondents agreed that the mathematical sets are not available.

Research Question 2: How often do mathematics teachers utilize instructional materials to teach mathematics to preschool children with hearing impairment in Oyo State?

Table 2: Utilization of Instructional Materials for the Teaching Mathematics in Preschools

S/N	Items	N	Always	%	Sometimes	%	Rarely	%	Never	%	Remark
1	Construction/ Drawing Instrument	120	17	14	24	20	45	38	34	28	Rarely
2	Measuring Tape /Ruler	120	23	19	11	9	49	41	37	31	Rarely
3	Charts/ Diagram	120	17	14	24	20	51	43	28	23	Rarely
4	Cardboard	120	21	18	35	29	46	38	18	15	Rarely
5	Mathematics Aquarium	120	26	22	31	26	47	39	16	13	Rarely
6	Mathematical Sets	120	28	23	31	26	43	36	18	15	Rarely
7	Shapes	120	12	10	28	23	53	44	27	23	Rarely
8	Concrete Object	120	24	20	29	24	57	48	10	08	Rarely
9	Projector	120	16	13	23	19	61	51	20	17	Rarely
10	Chalkboard	120	51	43	35	29	23	19	11	09	Always

Source: Field survey (2023)

Results in table revealed that 38% of the respondents agreed that the construction/ drawing instrument are not been utilized available. 43% of the respondents agreed that the charts/ diagrams are not been utilized available. 36% of the respondents agreed that the mathematical sets are not been utilized available.

Research Question 3: What are the challenges hindering effective use of instructional materials for the teaching and learning of mathematics for preschool children with hearing impairment in Oyo State?

Table 3 Challenges of Instructional Materials for the Teaching Mathematics in Preschools

S/NO	Items	N	Agree	%	Disagree	%	Remark
1	Unavailability of Instructional Materials	120	85	71	35	29	Agree
2	Inadequate knowledge of teachers on how to use instructional Materials	120	104	87	16	13	Agree
3	Poor knowledge of teachers on improvisation of Instructional Materials	120	114	95	6	5	Agree
4	Lack of Funds	120	91	76	29	24	Agree
5	Time Factor	120	82	68	38	32	Agree

6	Overpopulation of pupils	120	110	92	10	08	Agree
7	Lack of incentive and encouragement to the teachers	120	74	62	46	38	Agree
8	Laziness on part of the teacher	120	86	72	34	28	Agree

Source: Field survey (2023)

Results in table 3 revealed that 71% of the respondents agreed that unavailability of instructional materials are among some challenges hindering effective use of instructional materials. 95% of the respondents agreed that the poor knowledge of teachers on improvisation of instructional materials is one of the challenges hindering the effective uses of instructional materials. 92% of the respondents also agreed that the overpopulation of pupils in the classroom affect the effective of use of instructional materials.

Discussion of Findings

The findings of **research question one** revealed that majority of the respondents agreed that instructional materials for teaching and learning of Mathematics to preschool children with hearing impairment are not available. The finding of this study is contrary to the findings of Cetin & Neslihan (2015) in USA who also noted that different types of instructional materials were available in mathematics classrooms. According to their findings, availability of different types of instructional materials promoted development of different mathematics skills. Njenga's (2014) findings and Bunyi's (2012) findings agree with the findings of this study, that in some schools, instructional materials like mathematics textbooks were inadequate and learners were forced to share the resource when required to refer to them for some activities. The findings of this study also disagree with the findings of Wambua and Murungi (2018) in Kibwezi Makueni County which revealed that different teaching and learning materials were available for teaching and learning social studies.

The findings of research question two revealed that mathematics teachers rarely utilize instructional materials to teach mathematics in preschool children with hearing impairment. The implication is that the use of instructional materials is inevitable if effective teaching and learning must be achieved. The findings are in line with that of Ikegulu (2014), who posits that instructional materials are used by teachers to enhance the quality of instructions and they help children to understand what has been taught. This is in line with Hazel (2014) who also made it clear to show the value of visual materials (charts, chalkboard, textbook, models, pictures and flashcard among others). The author also said this "that what I hear I forget, what I see, I remember and what I do, I know". It is essentially important to teach pre-school children with materials (toys) which can be seen and handled by them.

The findings of research question three revealed that unavailability of instructional materials; poor knowledge of teachers on improvisation of instructional materials and overpopulation of pupils in the classroom are some of the challenges hindering the effective of use of instructional materials. This finding is in line with the findings of Afolabi and

Adeleke (2010) also identified non-availability, inadequacy and non-utilization of learning materials as a result of teacher's poor knowledge as factors responsible for the use of lecture method. Ogbondah (2008), therefore, advocated for teachers' resourcefulness and also encouraged them to search for necessary instructional materials through local means to supplement or replace the standard ones. This will in no small measure help to improve learning experience of the students in Mathematics.

Conclusion

Based on the findings of this study, it is concluded that in instructional materials for teaching and learning of Mathematics to preschool children with hearing impairment are not available. The study also revealed that mathematics teachers rarely utilize instructional materials in teaching mathematics to preschool children with hearing impairment. The implication is that the use of instructional materials is inevitable if effective teaching and learning must be achieved. Finally, the study revealed that unavailability of instructional materials; poor knowledge of teachers on improvisation of instructional materials and overpopulation of pupils in the classroom are some of the challenges hindering the effective use of instructional materials.

Recommendations

Based on the findings, the following recommendations are made:

1. Only qualified Mathematics teachers should be employed to teach preschool children with hearing impairment.
2. Seminars and workshops should be organized for Teachers in the use and improvisation of instructional materials in learning and teaching of mathematics for preschool children with hearing impairment.
3. There should be adequate provision of instructional materials for preschool children with hearing impairment.
4. School heads should give priority on issues concerning materials required in the adaptation of instructional materials for learners with hearing impairment.

References

- Afolabi, L. A. & Adeleke, K. E. (2010). Instructional material based lectures in investigation of student-perceived novelty and effectiveness. *Communication Quarterly*, 71.
- Ayiema, J. O. (2019). Determinants of teachers' use of instructional resource in teaching pre-primary school science and mathematics activities in Machakos County, Kenya. A Research Thesis Submitted in Fulfillment of the requirements of the Degree of Doctor of Philosophy (Early Childhood Studies) in the School of Education, Kenyatta University
- Bruner, J. S. (1966). *Toward a Theory of Instruction*, Vol. 59, Harvard University Press,
- Bunyi, G., Cherotich & Piper. B. (2012). *Primary Math and Reading (PRIMR) Program*: Kenya Education Policy Study Report United States Agency for International Development: USAID/Kenya. RTI International: Research Triangle Park, NC 27709-2194.
- Cetin, S. O. & Neslihan, B. (2015). Enhancing the early skill: Examining the print features of preschool children's book. *International Education Studies*, 8(1)113.

- Hazel, M.N. (2014). Teaching aids and resources for effective teaching and learning Jos.
- Ikegulu, B.O. (2014). Instructional materials development in implication of the comprehensive.
- Mueni, N. P. (2019). Influence of use of instructional materials on acquisition of mathematical competencies among grade one learners in Nakuru County. *A Research Project Submitted in Partial Fulfillment for the Award of the Degree of Master of Education (Early Childhood and Special Needs Education), School of Education, Kenyatta University.* x, 72.
- Mueni, N. P. (2019). Influence of use of instructional materials on acquisition of mathematical competencies among grade one learners in Nakuru County. *A Research Project Submitted in Partial Fulfillment for the Award of the Degree of Master of Education (Early Childhood and Special Needs Education), School of Education, Kenyatta University.* x, 72.
- Nakayiza, F. (2019). *Adaptation of instructional materials for children with hearing impairment in primary schools in Goma division, Mukono municipality* (Doctoral dissertation, Kyambogo University (un published work)).
- Njenga, J. W. (2014). *Factors Influencing Pupils' Performance in KCPE National Examination in Public and Private Primary Schools.* (M.Ed, University of Nairobi).
- Nnabugwu, J. O., Onwuka, L. N., & Ugwu, D. I. (2020). Availability and utilization of instructional material in the implementation of early childhood literacy curriculum in public schools in Orumba South. *Journal of Early Childhood and Primary Education*, 2(1), 38-48.
- Nnabugwu, J. O., Onwuka, L. N., & Ugwu, D. I. (2020). Availability and utilization of instructional material in the implementation of early childhood literacy curriculum in public schools in Orumba South. *Journal of Early Childhood and Primary Education*, 2(1), 38-48.
- Nnabugwu, J. O., Onwuka, L. N., & Ugwu, D. I. (2020). Availability and utilization of instructional material in the implementation of early childhood literacy curriculum in public schools in Orumba South, *Journal of Early Childhood and Primary Education*, 2(1), 38-48.
- Ogbondah, M. A. (2008). The real benefits of educational resources in the teaching and learning process in secondary schools. *Journal of Educational Research and Review*, 8(21).
- Okoji, O. O., & Olubayo, M. A. (2021). Assessment of Availability and Utilization of Instructional Resources for Teaching Primary School Pupils' Mathematics in Ilorin Metropolis, Nigeria. *African Journal of Educational Studies in Mathematics and Sciences*, 17(2), 1-12.
- Oni, L. O. (2019). Use of instructional materials for teaching mathematics in Junior Secondary Schools, *AJB-SDR*, 1(1), 85-90.
- Osman, D.M., Oracha, P.A. & Joel, O. (2020). Assessment of availability and Use of Teaching and Learning Resources for Retention of Learners with Special Needs in Regular Primary Schools in Dadaab Sub-County, Kenya. *IRA International Journal of Education and Multidisciplinary Studies*, 16(2), 112-122.
- Osman, D.M., Oracha, P.A., Joel, O. (2020). Assessment of availability and Use of Teaching and Learning Resources for Retention of Learners with Special Needs in Regular Primary Schools in Dadaab Sub-County, Kenya. *IRA International Journal of Education and Multidisciplinary Studies* (ISSN 2455-2526), 16(2), 112-122. DOI: <http://dx.doi.org/10.21013/jems.v16.n2.p4>.
- Rusyani, E., Ratnengsih, E., Putra, A. S., Maryanti, R., Al Huseani, D. F., & Ragadhita, R. (2022). The drilling method application using abacus to arithmetic operations skills in student with hearing impairment at special school. *Indonesian Journal of Community and Special Needs Education*, 2(1), 1-10.
- Sandbox, A. J. (2017). "A Framework for Mathematics Teachers' Evaluation of Digital Instructional Materials: Integrating Mathematics Teaching Practices with Technology Use in K-8 Classrooms", In Society for Information Technology and Teacher Education International Conference. *Association for the Advancement of Computing in Education (AACE)*.
- study of Geography in secondary schools in Lagos. Nigeria.
- Suarsana, I. M., Mahayukti, G. A., Sudarma, I. K., & Pujawan, A. A. G. S. (2019, February). The effect of interactive mathematics learning media toward mathematical conceptual understanding on

- probability of hearing-impaired students. In *Journal of Physics: Conference Series* (Vol. 1165, No. 1, p. 012021). IOP Publishing.
- UN (1948). *The Preparation and Evaluation of Instructional Materials on Community Agencies*, 21, 2, University of Kentucky.
- UNESCO (1994). *The Salamanca Statement and Framework for Action on Special Needs Education*, Paris: UNESCO.
- UNESCO (2017). *Inclusive and Adaptive Teaching: Meeting the Challenge of Diversity in the Classroom*. London: Routledge. University. *Journal of Education* 413.
- Wambua, M. M. & Murungi, C. G., (2018), Teaching and Learning Materials, Teacher Pupil's Ratio and its Influence on Pupils' Performance.
- Yusuf, H. O., & El-Yakub, S. U. (2020). Impact of using ICT in teaching reading comprehension in secondary schools in Kaduna, Nigeria. *European Journal of Education Studies*.