



The Educational Implication on the Role of Improvisation in Teaching and Learning of Mathematics in Nigerian Primary and Secondary Schools

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Abstract

The availability and utilization of instructional materials are problematic to the developing countries like Nigeria unlike the developed ones. However, this is due to lack of technological development and the resources available. What is therefore required to improve the situation in schools an improvisation in teaching and learning of mathematics in order to provide a sense of satisfaction, quickening of interest and thus, the best kind of motivating stimulus to the students. Moreover, against this background, the research work attempts to documents the roles of improvisation in teaching and learning of mathematics in schools, highlight on the importance or uses of the improvisations, the need for improvisation, and the criteria for improvising an improvisation (improvisational materials. Finally, the research work ended by a conclusion and recommendation which outlines the roles of mathematics teachers, students, non-governmental bodies and government in the provision and maintenance of mathematics improvisational materials (improvisation) in schools especially primary and secondary schools.

Key Words: Role, improvisation, teaching, and learning

Introduction

The knowledge of mathematics on the other hand is not enough if we do not know how to pass it unto the pupils and even training is not enough if we do not acquire knowledge and skills on how to teach the subject. To this end, for any society to move forward both technologically and economically, pupils should be intellectually equipped with mathematical knowledge and to aid this, there is need for instructional materials which will assist the teachers in explaining to the pupils or students some aspect of mathematics which might seem abstract, thus making the learning of mathematics especially in our secondary schools, more are meaningful, enjoyable and interesting. (Here, discuss what instructional material is and bring reasons for improvisation which may be as a result of unavailability of the materials).

These materials are known as improvisational materials (local teaching aids). (en.wikipedia.org/wiki/mathematics define mathematics as the study of quantity, structure, space and change. Mathematics seeks out patterns, formulate new conjectures and establish truth by vigorous deduction from appropriately chosen axiom and definition.

Mathematical improvisations play a dominant role in the teaching and learning of mathematics at any level of education. In view of this, Yero (2000), was of the opinion that, appropriate improvisation is what both the teachers and students need for effective learning in the classroom. No matter the knowledge of the subject matter possessed by the teacher, he still need improvisation (local teaching aids) in the absence of modern teaching aids in other to enable him make concrete, some abstract concept of mathematics to the-learners. In addition, Alabi's (2020) was of the opinion that "What I hear, I likely forget, what I see, I remember and what I do, I know": He (Alabi's) also maintained that, mathematical improvisations are useful to both teachers and learners in the teaching and learning of mathematics. the availability and usage of mathematical improvisation depends largely on the teachers creative abilities and However, the availability manipulative skills (Oyeniran & Falayajo 1996).

This research work therefore focuses on ascertaining and documenting the improvisation. How often they are used and how effective are they in the teaching and learning of mathematics in' schools e.g. primary and secondary schools. However, the availability and usage of mathematical improvisation depends largely on the

teachers' creative abilities and manipulative it (Oyeniran & Falayajo 1996). This research work therefore focuses on ascertaining and documenting the improvisation. How often they are used and how effective are they in the teaching and learning of mathematics in schools e.g primary and secondary schools.

Statement of the problem

The aim of the research is to find out the roles of improvisation in the teaching and learning of mathematics in schools e.g primary and secondary schools. The research also tries to find out the types of mathematics improvisation, areas of mathematics where they are used in teaching, how regularly, effectively and adequately. These improvisations are used in teaching mathematics both primary and secondary schools in the region under review. It also tries to find out what problems teachers encounters in producing and using these improvisation in teaching mathematics.

To this end, the effective use of adequate and appropriate improvisation in teaching mathematics will therefore help in encouraging students to study mathematics by making the subject interesting to them as such as reduce their fear for the subject it will also engender their interest for the subject thus enriching. Their knowledge of it and reducing failure rate especially in common entrance, NECO and WAEC Examinations.

Types of Improvisation Materials and Their Areas or Topic Where They can be Used

1. **Concrete Objects:** These are solid materials used for counting leading to place value system. Example are stones square blocks, abacus, bottle tops. They are used majorly in ALGEBRA.
2. **Books:** they as a source of reference to both the mathematics teachers and students. They supply currents information which will help both teacher s and learners to achieve the objectives of the lesson example Textbook, Laboratory Manuals, teachers guide (lesson note) students' notebooks etc. These improvisations are used in all fields or area of mathematics.
3. **Models:** These are concrete device used by teachers and students. to demonstrate mathematical concepts. They are broadly classified into two.

- a. **Opaque Materials:** concrete models for which the external part is to be considered and as such are made from opaque materials. e.g. cone, cylinder etc.
- b. **Transparent Materials:** these are concrete models in which the internal structure are required and are constructed from transparent materials e.g. water proof etc. examples of such models are cuboids, sphere, triangular prism etc. These improvisations are also applicable are also applicable to. All areas of mathematics.
4. **Mathematical Games:** these are game puzzles in mathematics meant to stimulate students interest and encourage reflexive thinking. It is a new development in mathematics known as "joyful learning". They are applied to all areas of mathematics.
5. **Mathematical Laboratory:** These are special room or space reserved in a school for the purpose of conducting practical tasks in mathematics. It supports the concepts of learning by doing and promotes students' perception of theories learnt in the classroom.
6. Construction materials e.g ruler, protractor, Compass: they are used for construction purposes.

Criteria for Improvising Improvisational Materials

The mathematics teacher is expected to put into consideration the following factors in selecting and using improvisation materials to enhance learning.

1. Age and ability of the learners: The teacher must put into or providing improvisational materials. This is because. When an improvisational materials provided are above the learners' cognitive ability, he will not understand the concept. Rather he will be confused.
2. Topics within the syllabus that, the students or pupils are not Conversant with.
3. The learners psychology: participation and attention. Improvisational materials consider the learners characteristics like readiness, interest and ability to stimulate their participation and attention.
4. They should be free from any kind of danger: every resource, materials should be harmless. They should never endanger the health of the learners and teachers.



5. A good improvisation should not be faulty: Improvisational materials to be used in the class must be in good condition and mechanically alright.
6. Relative to lesson objectives: Every teaching improvisation to be used should facilitate the learners learning. It must be centre on achieving a good lesson objective.
7. Currency information: Every teaching improvisation to be used must be current enough to supply information to students accurately.
8. They should be relevant and easy to get: Resource materials to be used in the class must be very cheap and very easy to get. It must equally be very much related to the topic of discussion in class.
9. Consider bringing the known to teach them the unknown, that's, what children see and do stays longer than mere learning.

Conclusion

Mathematics education constitutes the bedrock of scientific and technological development in any country. Therefore, conscious effort aimed at enhancing its teaching and learning should be made.

The use of improvisational materials by mathematics teachers when presenting, their lesson is recommended for effective teaching and learning of mathematics in primary and secondary schools.

However, improvisational materials are readily unavailable by the mathematics teachers for usage. Therefore, an effort should be made to improvise an improvisational materials from available resources within the environment by the mathematics teachers. The study shows that, the use of improvisational materials in teaching and learning of mathematics has a significant effect on improving performance among primary and secondary schools students. This is significant because the improvisational materials enhance the communication process between the mathematics teachers and students. The poor performance of students in mathematics was due to the presence of communication barriers, which had resulted in low comprehension lack of interest and confusion. But using improvisational, materials in teaching and learning of mathematics reduce communication barrier that had been affecting the performance of students. Thus since mathematics is subject that is full of practical activities then the use of improvisation materials is called for, which make both the teachers

and students of mathematics very effective in the teaching and learning process. It is very important mathematics teacher to critically examine the improvisational materials so that they can avoid irrelevance and prejudices, this will bring inculcation of desirable attitudes in learners.

Recommendation

The researchers recommend the involvement of the under listed organizations and bodies for the attainment of success.

- a) Involvement of teachers: The mathematics teachers should be creative enough to improvise an improvisational materials so that, they can attain the basic teaching objectives without stress.
- b) Involvement of student: the researchers also recommend the involvement of by teachers in order to facilitate learning improves the cognition of the learners and also their memory has been equally improved as they listen to their teachers keenly therefore, they, should assist the mathematics teachers in preserving. The improvisational materials for their in preserving the improvisational materials for their own benefit. The students can also help the teacher in improvising an improvisational materials by using available materials like wood, rope, cardboard paper etc.
- c) Involvement of non-governmental bodies: The mathematics teachers should be fully assisted by bodies like Muslim Student Society of Nigeria (MSS.N), Christian Association of Nigeria (CAN), Jama'atul Nasrul Islam(I.N.I) etc. in improvising improvisational.
- d) Involvement of government: most of the task of making materials for attainment of basic teaching objectives in mathematics. Improvisation available to the mathematics teachers lies in the hands of the government. The government information units and various governmental organization and ministries of education should come to the aid of mathematics teachers by providing improvisational materials so that, the mathematics teachers would not teach without improvisation and also to avoid borrowing of improvisational materials from the neighboring schools. The government should set-upon agency or body that will be Supervising the primary and secondary schools in the aspect of the availability and usage of mathematics improvisational materials. In general, teachers should be sponsored to conference and workshops so as to improve on their method of communicating mathematics concept in the classroom.



The government should endeavor to equip the school mathematics laboratory and provide an improvisation materials within the limited resources available as these will enable students to grab basic mathematics concepts.

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