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ROLE OF IMPROVISED INSTRUCTIONAL MATERIALS IN TEACHING AND LEARNING

ETHEL-ECHEDO, EBERE M.
FEDERAL COLLEGE OF EDUCATION (TECHNICAL)
UMUNZE, ANAMBRA STATE

Abstract

In the teaching and learning process, instructional materials reconcile the learner with the content. In the absence of instructional materials, the goal of learning may be defeated, as learners struggle laboriously to make meaning out of the content. The prevailing dearth of instructional materials in the school system, however, has continued to be one of the challenges of teaching and learning in the contemporary time, that improvisation of instructional materials has become an inevitable alternative. Skeptics, however, tend to undermine the efficacy of improvised instructional materials in teaching and learning. Based on this, the paper explored the roles of improvised instructional materials in teaching and learning. Using documentary sources, the paper reviewed the concepts of instructional materials and improvisation. Instructional materials are conceived as all things that are used to support, facilitate, influence, or encourage acquisition of knowledge, competency and skills. They are the devices which the teacher employs to reconcile the learner with the content which he should learn. Improvisation is an alternative to the readymade instructional materials where the latter is not available. Both theoretical and empirical studies support the efficacy of improvised instructional materials, and in some comparative studies, improvised instructional materials were found more effective than the standard instructional materials. The utilization of improvised instructional materials, however, is faced with some challenges, such as the teacher's competence to develop the same, financial constraints, lack of skills and strategies on improvisation, large class size, time constraint, unavailability of tools and lack of exposure to improvisation. Despite these challenges however, there is the need for improvisation as an alternative in the face of resource acquisition problems bedeviling the education sector in Nigeria. In view of this, the study suggested, among other things, that there should be in-service training for teachers on improvisation; and the Teachers' registration Council should liaise with other relevant bodies to organize training workshops for serving teachers. Also, teacher associations should organize conferences and workshops with improvisation as a theme to assist teachers acquire skills on improvisation of instructional materials; and schools should partner with industries to assist in improvising materials for teaching and learning.

Key Words: Instructional Materials, Improvisation, Teaching and Learning

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Introduction

One of the main tasks of the teacher is to mediate between the learner and the content. A learner is a person making deliberate effort to acquire the content. Curriculum contents are facts, concepts, values, skills, attitude, knowledge, theories, principles and subject matter to be acquired (Kanno, 2017). In this onerous mediation task, the teacher displays some obvious behavior in order to achieve the desired results. The use of instructional materials is one of such behaviors. Instructional material simply means the teaching device that helps the teacher to clarify, establish, correlate and coordinate various concepts, interpretations and applications (Balogun, 1982 in Ahmed, 2016). As a proverb says "A picture is worth a thousand words". Instructional materials are learning resources that help in teaching and learning processes, which help the teacher to deliver the lesson in the course of teaching.

Instructional materials play the role of a stimulant in the teaching and learning process. They introduce a learner to first hand materials and convey a precious quality of intimacy (Amadi, 2012). In furtherance, they help the mind of the learner on what is taught apart from being aids to memory. Furthermore, they make learning and teaching more understandable and real. Instructional materials boost teaching and learning as they stimulate thinking and concretize learning (Ige, 2010). Successful implementation of any curriculum is almost fully dependent on the quality and quantity of instructional materials available to teachers and students for use in schools (Usman & Adewunmi, 2016). Instructional Materials give teachers the air of guidance, co-ordination, supervision and more time for correction in the class lesson.

While instructional materials aid teaching and learning, they are not always readily available for use. Thus, in the alternative, teachers are usually encouraged to improvise these materials to serve the same purpose. Researchers like Eshiet (2011), Bassey (2012) and Nwosu (2012), have observed that there are inadequate instructional materials for the teaching and learning in public schools in Nigeria. Teachers have to source for them. This act of sourcing for instructional materials when the standard ones are not available is improvisation (Eshiet, 2011). He explained improvisation to mean the sourcing, selection and deployment of relevant instructional element of the teaching and learning processes in the absence or shortage of standard or accredited teaching and learning elements for a meaningful realization of specified educational goals and objectives.

This paper attempts to project the role of improvised instructional materials in teaching and learning. It explores the concepts of instructional materials and improvisation, highlights the role

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of improvisation in teaching and learning, determines the challenges of improvisation, and suggests strategies for improvisation of instructional materials in teaching and learning.

Concept of instructional materials

Instructional materials have been defined and explained in several ways. Eniayeju (2015) viewed instructional materials as materials which provide concrete experiences which a learner needs in order to develop intellectually. It is also described as materials capable of achieving the objectives of the concept to be taught (Adebimpe, 2015).The two descriptions, however fail to provide a pragmatic meaning of the concept of instructional materials, rather they provide what they assumed can be achieved with them. For Isola (2010), instructional materials are objects or devices that assist teachers to present their lessons logically and sequentially to the learners. Abiodun-Oyebanji and Adu (2007) add that instructional materials are all things that are used to support, facilitate, influence or encourage acquisition of knowledge, competency and skills. According to Abdu-Raheem (2016) instructional materials are essential and significant tools needed for teaching and learning of school subjects to promote teachers' efficiency and improve students' performance. It may be deduced from these definitions that instructional materials are those things that a teacher uses in the course of teaching/learning to make learning simple, easy to understand, aid retention and recall whenever it is necessary. Ahmed (2016), asserts that instructional resources ensure that the learners see, hear, feel, recognize and appreciate as they learn, utilizing almost all the five senses at the same time.

Instructional materials can be categorized into three, based on sensory appeal, namely: audio, visual, and audio-visual instructional materials (Akpan, Okoli &Akpan, 2018). Audio instructional materials are those that appeal to the auditory senses such as radio, audio tapes, VCDs, DVDs and other high definition electronic devices. Visual instructional materials appeal to the sense of sight and they come in the form of pictures, prints, real objects (models), to mention but a few. Audio-visuals appeal to both the auditory and visual senses of the learner and stimulate interest to learn. Such materials take the form of films, television, audio-visual tapes and CDs. ICT has delivered several packages that can aid teaching and learning to achieve desirable learning objectives. These packages are found in mobile devices like smart phones, personal computers, internet facilities and the likes. ICTs provide a lot of learning experiences to learners with varied interest and capabilities. Pictorial illustrations are valuable assets. Projected visuals are able to convey information and specific experiences that are needed for the development of workable concepts. Films can modify motivations, interest, attitude and opinions. Realia (real objects) or three-dimensional models can be effective in teaching/learning as the learner learns a great deal by examining and manipulating a model.

Concept of improvisation

Improvised instructional materials are teaching materials designed and produced from the available local materials in order to enhance effective teaching and learning in schools.

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Improvisation is the use of local resources in our environment to assist in the smooth dissemination and transfer of knowledge from teachers to students. Abbot cited in Eze (2012) defines improvisation as making of substances from local material found at home or school premises when the real or original materials are not available. According Eze (2017), improvisation is the act of using alternative materials and resources due to lack or insufficiency of some specific first hand teaching aids to facilitate instruction. To Bromide (2010), improvisation is an act of using materials and equipment obtainable from local environment, or designed by the teacher or with the help of local resource personnel to enhance effective instruction. Improvisation appeals to the three educational domains: the cognitive, affective and psychomotor domains respectively. According to Fajola (2018), improvisation of instructional materials can be defined as a process of using alternative resources for enhancing teaching in the absence or shortage of the real ones.

Improvisation in the view of Aremu (2008), is a technique of originating a totally new tool, instrument, materials, device or modifying existing ones for serving a particular purpose. Ahmed (2010) also sees improvisation as the process of making equipment and materials by the teacher or by engaging the services of others in the absence of the real or manufactured ones. Wasagu (2010), described improvisation as the act of using alternative materials and resources to facilitate instruction whenever there is a lack of or shortage of some specific first hand teaching aid.

Olagunjo (2008), however, asserted that improvisation provides a cognitive 'bridge' between students' abstract and real experience of teaching and learning. According to Olagunjo, when a teacher improvises, it enables him to re-think and research for cheaper, better, and faster methods of making the learning process easy and safe for both the students and the teachers. Generally, improvisation of instructional materials is an attempt to adapt and make use of local resources in the teaching/ learning process when the readymade materials are not available or are in short fall or not within the reach of the users. The improvised instructional materials could be produced by the teacher, a technician or the students. The production of the alternative resources is initiated by the teacher and done either by him, the students or the local craftsmen (e.g. the Carpenter, blacksmiths, wielder, etc). When students are involved in the production of improvised instructional materials through their creative ability and imagination, it gives new concept of things outside the range of ordinary experience to the students and makes learning last longer in their memory. For a teacher or student to be able to improvise, he/she must be innovative, resourceful and creative in both thinking and manipulative skills (Igwe, 2013).

Fajola (2008) looked at improvisation from the level of creativity involved. These levels involve substitution and construction. Substitution in improvisation simply implies the techniques whereby a local material is used in place of a piece of equipment that is not available whereas construction involves making of a new instrument in place of the unavailable original one where substitution is not possible. It is expected that both substitution and construction of improvised instructional

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materials will meet the demand for the real or original material with as high precision as time, money and other facilities and factors will permit.

Role of improvisation of instructional materials in teaching and learning

According to Ehikioya (2010), the major reason for improvisation stems from the fact that educational funding is insufficient and in the recent years seriously dwindling. Educational authorities find it increasingly difficult to provide the schools with all they need for teaching and learning. Zarewa (1991) as sited by Johnson (2010), noted that no matter how rich and generous educational authorities might be they are not always in position to provide their schools with all the materials they may need. Therefore, the schools, students and teachers might be obliged to make the most of what they can get or construct from locally available raw materials. Since standard instructional materials may not be available or adequate, and meaningful learning may not take place outside the instructional materials, improvisation becomes imperative.

Improvised instructional materials make teaching concepts more interesting to both students and teachers in the classroom. In the teaching and learning of science, improvised instructional materials help students to realize that science has to do with ordinary things and will possibly motivate them to carry out experiments and learning activities themselves using such improvised materials (Johnson, 2010).

Improvised instructional Materials allow students to have relatively uniform attention and opportunities to practice and acquire skills. They make teaching experiences flexible and rich enough to meet individual students' learning styles. Olumiran, Ajidagba and Jakeyinfa (2010) noted that improvised instructional materials, like standard ones have direct contact with the sense organs. Students are able to use a combination of senses (smell, hearing, touch, taste and sight) for easier and better acquisition of concepts and facts they are being taught. Instructional materials enable students to see as a whole certain relationship that are difficult to conceptualize in parts. For instance, students learn to identify and differentiate the shapes more accurately when they see the real objects. It allows them to compare and contrast the shapes and make a mental note of their similarities and differences. Omojuwa, (2010) noted that by the means of improvised instructional resources, students could learn about things too dangerous, too small or not just expedient to bring to the classroom e.g. a lion or a waterfall or a mountain. Any of these can be effectively taught to the pupils in the classroom by the use of appropriate improvised instructional materials.

Onuekwusi (2005) accounts for what improvised materials can do as follow: They heighten motivation for learning because of their concreteness, foster continuity of thought when words are coupled with explanations in pictures and sounds, provide freshness and variety, appeal to students of varied interests and abilities. Others include; encouragements of active participation, give need reinforcement, widen the range of students' experience, assure order and continuity of thought and improve the effectiveness of other materials. Improvised instructional materials are vital to

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teaching and learning because they generate interest which in turn triggers learning and promotes technology transfer. Ibe-Bassey (2008) confirms that when in the classroom a teacher presents a stimulus, he consciously intends to evoke a positive behaviour; if he uses a model the students will learn. Ibitoye (2011) believes that the improvisation of instructional materials will certainly lead to the utilization of such materials. This implies that accessibility of instructional materials will lead to its utilization. Utilization of materials aids the achievement of the stated objectives which in turn gives the teacher a sense of satisfaction and fulfilment. It is therefore expected that the teacher does all that is within his reach to enrich the instructional environment as it concerns the utilization of improvised instructional materials. This calls for commitment on the part of teachers. He has to improvise where and when there is none available.

Each category of instructional material serves some definite purposes. Eniayewu (2015) asserts that it is very important to use instructional aids for instructional delivery to make students acquire more knowledge and to promote academic standard. Akinleye (2010) stated that effective teaching and learning requires a teacher to teach the students with instructional materials and use practical activities to make learning more vivid, logical, realistic and pragmatic.

Studies have confirmed that instructional materials are vital for teaching and learning, and when not available, improvisation effectively takes its place. Akpan and Onoh (2018) investigated the effects of the accessibility and utilization of improvised instructional materials by teachers on the academic performance of secondary school students in Ikwuano Local Government Area of Abia State, and found that the disposition of the teachers affected the accessibility and utilization of instructional materials, and that students who were taught with improvised instructional materials performed better than those who were not. Moreover, there was no difference in the performances of students taught using standard instructional materials and improvised instructional materials. The findings suggest that improvised instructional materials are as good as the standard ones, and it is necessary to improvise in the absence of standard instructional materials. Akpan, Okoli and Akpan (2018) made similar discovery in a study of primary school pupils in Ikwuano Local Government Area of Abia State.

The efficacy of instructional materials, also has been supported by some empirical evidence. Iji, Ogbole and Uka (2014) used improvised instructional materials to ascertain students' geometry achievement at the upper basic education one at Makurdi metropolis. The study found that students taught with improvised instructional materials improved on their geometry achievement. In yet another study, Oladejo, Olosunde, Ojebisi and Isola (2011) examined the effect of using standardized and improvised instructional materials on academic achievement of secondary school Physics students in Oyo State, Nigeria. Findings revealed that there is a significant difference in the achievement of students taught using standard instructional materials, those taught with improvised instructional material and those in the conventional instruction. Thus, the students taught with improvised instructional materials obtained the highest achievement score at posttest

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(F=74.94), followed by those with standard instructional materials (F=63.07), while the control group scored the lowest (F=39.89). Thus, Physics teachers were enjoined to be resourceful in instructional materials selection, planning and utilization so as to reduce the cost of production and maintenance of instructional materials. The researchers concluded that the utilization of improvised instructional materials promote and enhance effective teaching-learning process, thus, Physics teachers should be encouraged to use them in secondary education programme.

Evidence from research findings suggest that improvised instructional materials can achieve the same, if not better results, as standard instructional materials. The role of instructional materials in teaching and learning, and ensuring the desirable learning outcome, therefore cannot be overemphasized.

Challenges of improvisation

In schools across Nigeria, dearth of instructional materials has remained a perennial problem of effective teaching and learning. There is the problem of lack of accessibility and utilization of instructional materials across all levels of the educational system. Ahmed (2003) affirms that in most secondary schools in Nigeria, teaching and learning take place under a most non-conducive environment without access to essential materials. This is why teachers are often encouraged to improvise instructional materials to make up for the gap and utilize same for instructional purposes. Ibitoye (2011) expressed that no matter how generous and rich the educational authorities might be they are generally not always in a position to provide their schools with all they need. Therefore, schools and teachers should make instructional materials accessible by improvising them. However, school teachers are faced with some challenges in improvisation of instructional materials.

Utibe-Abasi (2015) investigated the problems faced by Secondary School Physics teachers in improvising instructional materials for effective teaching and learning of Physics in Akwa Ibom State of Nigeria and found that problems faced by Physics teachers during improvisation to include financial constraints, lack of skills and strategies on improvisation, large class size, time constraint, unavailability of tools and lack of exposure on improvisation. The study also showed that these problems faced by teachers were not gender and location sensitive as there was no significant difference in the mean responses of male and female or urban and rural Physics teachers in improvisation of instructional materials. In as much as improvisation is meant to mitigate the cost of standard instructional materials, it does not necessarily mean that this alternative is without some cost. Teachers equally need skills to improvise, a quality which is lacking in some of these teachers.

Balogun (2012) identified two main constraints militating against the successful improvisation which are similar to the above. These are the technical and the human factors respectively. While

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the technical factors relate to the question of degree of accuracy and precision that is possible with the improvised equipment, the human factor relates to the teachers' skill in developing the resources while providing the appropriate learning experience to the learners. Thus, Maduabunm (2013) reported lack of adequate professional training as a major problem militating against the effective use of local resources for teaching.

Olibie, Nwabunwanne and Ezenwanne (2013) found other challenges to improvisation of instructional materials in schools. These include how to: improvise materials to arouse and sustain learners' optimism and enthusiasm; access expert assistance and technical support; stay informed of innovative developments; have confidence to share ideas with other teachers; interpret research and statistical data; diplomatically handle students' resistance; align improvised materials with curriculum guidelines and timelines; and develop materials to cater for individual learner's needs in overcrowded classrooms.

According to Mensah (2015), most improvised materials lack precision and accuracy in measurement which may eventually undermine the exact outcome of the experiment. Sometimes, the cost involved in designing these materials may be more expensive than buying the original ones. Again, the available material may not be suitable or appropriate for the lesson and can subsequently yield unexpected results (Aina 2013). This can make learning more difficult and frustrating.

Furthermore, improvisation demands creativity, adventure, curiosity and perseverance on the part of the teacher, such skill can be realized through training programs with the instructional materials. The perception of some teachers towards improvisation could also affect other teachers positively or negatively in the production of instructional materials.

Strategies for improvisation of instructional materials in teaching and learning

According to Eze (2017), teachers should always learn to improvise when factory-made instructional materials are not available to concretize their lessons that are abstract in nature, and to improve students' achievement in the subject and teachers should be encouraged by school management through reinforcement for improvising to improve students' academic retention, lifelong and meaningful learning.

There are some suggestions put forward for improvisation of instructional materials in schools. For instance, Utibe-Abasi (2015) recommended that seminars and workshop on improvisation should be organized for teachers by the authorities concerned in order to improve their skills on improvisation. Similarly, Olibie *et al* (2013) advocated teachers' self and group professional development, training, and Internet literacy to mitigate the challenges of improvisation. In a similar vein, Akpan and Onoh (2018) recommended that teachers should be made to undergo periodic trainings to update themselves on the modern trends in instructional technology. Isola (2010)

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stressed the need for a definite well planned training programme of improvisation for teachers. He suggested regular meaningful workshop on improvisation technique for Science teachers to improve and up-to-date their competence.

The emphasis on training suggests that the training of teachers on improvisation is a prerequisite if improvisation will serve as effective alternative to standard instructional materials in the school system. Teachers need to be innovative. With greater use of the internet in teaching and learning, teachers have storehouse of opportunities to learn skills as well as broaden their access to available resources to improve learning among their students.

A case also has been made for the local, state or national education resource centres to establish an instructional material bank within the reach of the teachers so that they could easily access one when the need arises (Akpan & Onoh, 2018). This will allow teachers to access the bank when the need arises instead of using the ones that lack precision and accuracy as well as compound the learning problem of students.

Conclusion

Instructional materials reconcile the learner and the content. It is a well-recognized component of teaching and learning process. Yet, the dearth of standard instructional materials occasioned by financial constraints and neglect of the educational sector, has placed on the education authorities and the teacher in particular the onerous task of seeking for an alternative in the absence of these materials. This is where the idea of improvisation comes in. Improvisation is the act of using alternative materials and resources due to lack or insufficiency of some specific first hand teaching aids to facilitate instruction.

Improvisation plays vital role in mitigating the consequences of absence or insufficient standard instructional materials. The challenges however, border on the ability of the teacher to initiate this move as well as the skills to utilize the local resources to provide these alternatives. While improvised instructional materials play vital role in teaching and learning, therefore, the challenges need to be tackled in order to improve improvisation in the school system.

Suggestions

In view of the forgoing, the following are suggested:

1. There should be in-service training for teachers on improvisation. The Teachers' registration Council should liaise with other relevant bodies to organize training workshops for serving teachers.
2. Teacher associations should organize conferences and workshop with improvisation as theme to assist teachers acquire skills on improvisation of instructional materials.
3. Schools should partner with industries to assist in improvising materials for teaching and learning.

4. Students should be encouraged to improvise instructional materials as this will build their interest in learning activities.

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