

# IMPROVISATION OF INSTRUCTIONAL MATERIALS IN 21<sup>ST</sup> CENTURY FOR EFFECTIVE TEACHING AND LEARNING IN TERTIARY INSTITUTIONS IN NIGERIA

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## **Abstract**

*To achieve effective teaching and learning process especially in tertiary institutions there is the need for the use of relevant instructional materials. And when the materials are not available and or adequate irrespective of the reasons, there is need for lecturers and or students to improvise in order to reduce abstract learning and enhance students' understanding and retention of what is being taught. This work therefore, focused on improvisation of instructional materials in 21<sup>st</sup> century for effective teaching and learning in tertiary institutions in Nigeria. This paper explored in details the concepts of improvisation and improvised instructional materials. Also discussed were the types of improvisation, the rationale for improvisation of instruction materials, relevance of improvisation to teaching and learning and factors that affect improvisation of instructional materials. Conclusion was also offered.*

**Keywords:** Utilization, Improved Instructional Materials, Teaching, and Learning.

## **Introduction**

Tertiary institution encompasses all the post-secondary education which includes universities, monotechnics, polytechnics and colleges of education. It contributes to personal, social and economic development through the formation of human capital primarily through teaching and the building of knowledge primarily through research. The aims and objectives of tertiary institution are: to educate the youth to become active and productive members of society, to meet and match industries' demand with a competent and globally competitive workforce. According to Wu (2015), the goals of tertiary institution include but not restricted to the development of relevant high level manpower, development of intellectual capability of individuals and acquisition of physical and intellectual skills. Thus, the skills gained and enhanced through tertiary institutions contribute to increased productivity in the workforce.

Therefore, the extent to which the aims and objectives of tertiary institution as highlighted among others can be meaningfully achieved may be dependent on the creative and manipulative skills of lecturers to improvise and use instructional materials on the instance of non-availability or inadequacy of instructional materials.

Tertiary institution students also need to improvise instructional materials for lecturers' usage. The need for both lecturers and students to improvise instructional materials remains very imperative and necessary because no matter how rich and generous educational authorities might be, they are not always in position to provide their schools with all the instructional materials they may need. In the same vein, Adu and Adu (2014) rightly maintained that "it is virtually impossible to purchase or make all the equipment, facilities and supplies required for sound and quality education available, especially in developing and underdeveloped countries".

Ahmad, Abdul, Sani and Sabo (2019) observed that the effective teaching and learning cannot take place without interaction between the teacher, students and the environmental resources. This is corroborated by Bawa and Abdullahi (2019) who maintained that effective teaching of any subject may not be attained without the use of instructional materials/equipment. Thus, the use of instructional materials for teaching and learning by teachers stimulates self-activity on the part of the students. Hence, due to the inadequate instructional facilities in some tertiary institutions in Nigeria, there is a need to bring new innovative ways of providing available materials for effective teaching and learning therein.

Therefore, improvisation of instructional materials for teaching and learning in tertiary institutions is one of the tasks both lecturers and students should consider necessary and important in the 21<sup>st</sup> century. The need for improvisation becomes essential especially in the case of Nigeria where there is inadequate capital to procure all the needed equipment and instructional materials. It is also necessary when population outweighs what is available because of the insufficient funding in education.

### **Conceptualization of Improvisation and Improvised Instructional Materials**

The concept of improvisation is generally a relative one and as such, can be applied in different contexts. Thus, in an educational context, the term improvisation etymologically is derived from the Latin word "improvisus", which means "the unforeseen". According to Holdhus and Dehlin (2012), to improvise is to be open to new perspectives and actions, with an expectation for what is not yet but which can be realized. Berk and Trieber (2009) cited in Kjellfrid and Espeland (2017) see improvisation in education as an applied, specific teaching skill developed in the profession of teaching where it can be learned and rehearsed. Lobman (2011) argues that teaching has been dominated by scripts based on curricula and meta-scripts in society; implying that to become a good teacher is to follow the transmission model of teaching and learning. Eriba (2011) defined improvisation as the act of construction of instructional materials from locally available materials that can adequately replace or function in place of the original material which otherwise may be very expensive or in short supply or unavailable.

According to Nwagbo (2015) cited in Ogbe and Omenka (2017), improvisation is an art of sourcing for and providing substitute materials for the original ones using what is locally available in the absence of standard materials usually aimed at meeting the specific instructional objectives. Ahmad, Abdul, Sani and Sabo (2019) see improvisation as the art of using materials or equipment obtained from the local environment or produced by the teacher and with the assistance. Stressing on the need to improvise and make use of the materials, Shodeinde (2015) admitted that the quality of teaching is a crucial factor in promoting effectiveness in schools. Effective teaching in turn requires teachers who are academically sound and care about the wellbeing of the learners. Thus, in every instructional setting, a

teacher may be confronted by students with varied learning problems and topics that require many hours of preparation but with limited amount of instructional materials to facilitate teaching and learning. Therefore, there is obvious reason for both teachers and students to improvise instructional materials needed for effective teaching and learning to take place.

Umoinyang (2019) conceived improvisation as a technique of originating a very new tool, instrument, materials, device or modifying existing ones for serving a particular purpose. To be able to promote quality instruction in tertiary institutions in Nigeria, there is the need to pay attention to improvisation of instructional materials in the teaching/learning process.

On the other hand, improvised instructional materials are materials, devices and techniques that help the teacher to make realistic approach to his job. Whether real or substitutes, these improvised instructional materials have a common goal; as they help the teacher to convey the intended message effectively and meaningfully to the learners so that the learners receive, understand, retain and apply the experience gained to reach overall educational goals. In a nut shell, improvised instructional materials are teaching materials which are designed and produced from the available local materials in order to enhance effective teaching and learning in schools (Onasanya & Adegbija, 2017).

Due to the poor state of Nigerian nation's economy, Onasanya and Adegbija advised that teachers, students, school authorities and communities should engage in improvising instructional materials in order to: develop in students and teachers adequate skill for improvisation, this will generate interest and motivation for indigenous technology, have practical and physical links between science and theory, eradicate the menace of lack of or inadequate instructional materials for science, sensitize both students and teachers that alternatives for some of the conventional science teaching materials are possible and achieve the set out educational objectives through the use of improvised instructional materials in teaching.

### **Types of Improvisation**

Locally produced instructional materials according to Eminah (2006) cited n Kamoru and Umeono (2016), can be categorized into three types namely: Improvisation by substitution, improvisation by modification and improvisation by construction. Similarly, Adu and Adu (2014) categorized the types of improvisation of instructional materials into three: improvisation by substitution, modification and construction.

**i. Improvisation by Substitution/Miscellaneous Materials:** A resourceful teacher devotes his/her time to produce materials best suited for learning purposes. Miscellaneous are locally available materials that are used just as they were collected without any alteration in shape or size. According to Adu and Adu (2014), improvisation by miscellaneous/substitutes are available local materials that can be used just as they are collected without any modification in size or shape. In the absence of standard materials, available local resources can be modified to serve the same purpose. For instance, empty carton can easily be altered to serve the purpose of first aid box. In the process of adjusting local recourses to serve a particular purpose, some alteration will be made against its normal shape and size.

**ii. Improvisation by Modification/Duplicated Materials:** With the aid of projection equipment, the teacher is able to produce cheaply with limited time, materials that serve

**iii. Improvisation by Construction/Collected Materials:** These are collected and compiled by the teacher to be used in the teaching learning activity, they include; pictures from Newspapers, magazines, and students work of good quality. It also involves the designing and construction of materials using low cost materials.

### **Rationale for Improvisation of Instruction Materials**

There are different reasons for which the improvising instructional materials in the school system are necessary. According to Ahmed (2017), the improvisation of teaching materials is to make teaching and learning more practical and subsequently reduce abstract learning. Another reason is the cost effectiveness; as often times foreign instructional materials may be too expensive to procure and consider the meager financial resources in schools, there is need for improvisation. Beyond cost effectiveness, availability of improvised materials is a factor too. Because they could be obtained from the local environment, the materials are easy to obtain compared to foreign instructional materials. They are generally very safe to use during demonstrations and experiments; as they might not be capable of inflicting injuries, which means it could be hazard free. In addition, they serve as a motivation to learners inasmuch as they participate in the activities during the production of the materials and also arouse learners' interest. Moreover, the use of these materials minimizes concerns about breakage, repair and loss since they are readily available in the environment.

The use of indigenous local materials is definitely safer, cheaper and cultural-sensitive alternative to the use of commercial and factory produced chemicals. When teachers and students use improvised instructional materials, it could lead to the discovery of new knowledge, and students' talents may be discovered. Using improvised instructional materials assist teachers economically and may make students more interactive. Beyond this, it makes students make use of their intellectual ability in the process of teaching and learning. A very important opportunity of using improvised materials for experiments is that, it enables learners to participate fully in the actual construction of the apparatus and gives them more idea09ols about how such materials work. Again, improvised instructional materials bring home to the classroom, and clarify unfamiliar principles and concept of science to learners. More so, when teachers improvise instructional materials for teaching, teachers' develop their potentials (Ramel-Galima, Rivera & Almanza, 2013).

### **Relevance of Improvisation to Teaching and Learning**

The need for improvising instructional in the view of Wilson (2019) is very important to teachers' day to day teaching and learning activities. And in order to make the process of instruction interesting, active and participatory, teachers and students need adequate knowledge of improvisation. The process of improvisation gives both teachers and students the knowledge of creativity, manipulative skills and critical thinking. Improvisation helps in saving cost of looking for ready-made instructional materials which are costlier. It encourages self-reliance and a feeling of confidence during instruction delivery. It provides employment opportunities for youths that are unemployed in the community. It saves time during instruction delivery. It also allows the teachers and learners to display their skills of

The use of improvised instructional materials in the classroom adds element of reality by providing concrete example to learning. Baikie (2015) pointed out that the utilization of instructional materials in teaching and learning process tend to support various activities among students. As such, Baikie added that students learn effectively when such learning experiences and activities are illustrated with improvised instructional materials. In the opinion of Brijesh and Yoghish (2015), the use of improvised instructional materials in teaching helps to increase learners motivation, recall earlier learning, activates learners' response, gives speedy feedback and encourages appropriate practice. Similarly, improvisation of instructional materials according to Tikon (2016) ensures the realization of lesson objectives; gives room for a teacher to demonstrate his/her creative skills; gives room for the use of cheap local materials as alternatives to the ready-made ones; enables teachers to think of better and faster methods of making teaching-learning process easier for learners as well as affords students the opportunity of becoming familiar with available resources in their environment.

Balogun (2012) opined that locally produced instructional materials encourage creative expression and foster experimentation, sensitive to tactile and visual experience improves. Creativity in classroom environment communicates to children and teachers what is expected of them and what is happening in the classroom. Locally produced instructional materials give teacher/students the pride of using their talents, allows a teacher to reproduce his potentials, in concrete form and increase teacher's knowledge of the subject matter. According to Ogbeh (2007) cited in Shodeinde (2015); improvisation of instructional materials for teaching and learning contributes to the achievement of stated education objectives by providing opportunity to develop necessary skills, attitudinal and practical skills needed to function effectively in the society. It also enables a teacher to rethink and research for cheaper, better and foster methods of making the teaching or learning process easier for the students. This implies, it promotes creativity and self-reliance. To some extent, improvisation fills the vacuum created by lack or shortage of equipment by providing a frame of reference on which students can key their attention during classroom activities. It provides a cognitive bridge to lead students from abstraction and its attendant-mental indigestion|| to a nodding acquaintance with reality, scholars refer to this as giving students the bread of living experience rather than the stone of abstract theory.

Improvised instructional materials ensure that the learners see, feel, recognize and appreciate as they learn, utilizing the five sense modalities at the same time. Hence, when the real instructional materials and equipment are not available, improvisation takes their place. This is to enhance the teaching and learning processes as well as make the expensive nature of scientific equipment, the difficulty experienced in procuring them as well as the excruciating and persistent problem of inadequate of funds irrelevant in achieving the instructional objective. It is a fact that non provision of real materials and equipment have all combined to worsen the teaching of science and technology education in schools (Lidia & Sara, 2010). With well packaged and relevant improvisation, the arbitrary and complete abstract of the subject matter in the face of the learner is significantly reduced to lend credence to the importance and essence of improvisation where and when the real instructional media are not on hand.

### **Factors that affect Improvisation of Instructional Materials**

There are several factors that tend to affect the improvisation of instructional materials for teaching and learning. Ogbe and Omenka (2017) identified two major factors that affect the improvisation of instructional materials. This includes: technical and human

IMPROVISATION OF INSTRUCTIONAL MATERIALS IN 21<sup>ST</sup> CENTURY FOR EFFECTIVE TEACHING AND LEARNING IN TERTIARY t  
Paul Agbade Olofu (BSUJEM Vol. 3 No. 1 2021)

**Technical Factor:** This factor has to do the issue of degree of accuracy and precision in which the improvised material or equipment could be. The challenge of accuracy and precision usually arise especially when imitative method of improvisation is to be adopted. In this case, the teacher or student who is to improvise tries to ensure that the material or equipment to be improvised must look exactly like the original one which is not available for use. Technical factor according to Ahmad, Abdul, Sani and Sabo (2019) relates to the challenge of accuracy and precision that can be achieved with the improvised materials and equipment. Ahmad, Abdul, Sani and Sabo added that the problem of technicality is even more pronounced and crucial at both secondary and tertiary levels where experiments that are more sensitive and observations are carried out. Other technical factors relate to the problems of usage of the improvised material or equipment. For instance, is it easier or difficult to use improvised materials? Is it more convenient or inconvenient to use improvised instructional materials?

**Human Factor:** This relates to the teacher or student's skills needed in developing the resources/material while providing the appropriate learning experiences to the learners. Maduabum (2013) cited in Ogbe and Omenka (2017) posited that the lack of adequate professional training is a major problem militating against the effective improvisation of local resources.

Human factor according to Ahmad, Abdul, Sani and Sabo (2019) is associated with the teachers' professional commitments, creative ability, technical skill, ingenuity and competence. The problem of commitment is very serious because improvisation requires creative imagination. If a teacher is not committed to improvising his/her instruction, he/she will not creatively think of substitute for equipment and materials and how to organize them. Another aspect of human factor can precipitate when a teacher becomes sensitive to ambience often displayed by government policies and actions. The attitudes of school heads sometimes are not encouraging; as they expect teachers to improvise out of their hard-earned salary without compensating or reimbursing them in return.

Beyond technical and human factors that affect the improvisation of instructional materials, Balogun (2012) noted that funding and availability of local materials also constitute serious problem. Balogun observed that sometimes teachers and students tend not to improvise because of lack of fund. Most school authority rather than supporting teachers and students to obtain local materials, allow teachers and students to use their personal money to get the materials. And when they (teachers and students) do not have the money or feel unwilling to use their personal money, improvisation cannot be carried out. With respect to availability, Balogun maintained that sometimes local materials may not be easily accessible and as such, it becomes very tasking and difficult to improvise when the needed materials cannot be obtained for usage.

## Conclusion

To be able to enhance quality instruction in tertiary institutions, there is the need for the utilization of instructional materials and when the needed materials or equipment are not available and or adequate, there must be need for both lecturers and students to improvise instructional materials for teaching and learning process. Therefore, every

lecturer should possess the needed skills of creativity in an instructional setting; thereby improvising instructional materials when the need arises. Tertiary institution students also need to possess creative and manipulative skills that would enable them to improvise when the need arises. By so doing, the problem of availability and adequacy of instructional

IMPROVISATION OF INSTRUCTIONAL MATERIALS IN 21<sup>ST</sup> CENTURY FOR EFFECTIVE TEACHING AND LEARNING IN TERTIARY

Paul Agbade Olofu

(BSUJEM Vol. 3 No. 1 2021)

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