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SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION**

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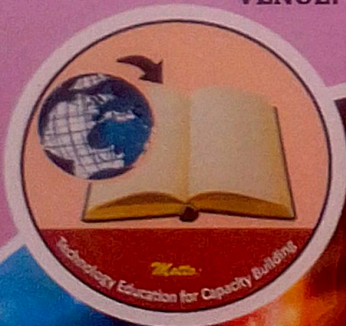
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## IMPROVISATION OF INSTRUCTIONAL FACILITIES AS A TOOL FOR COUNTERACTING THE EFFECTS OF SHORT FUNDING ON TEACHING AND LEARNING SCIENCE AND TECHNOLOGY IN NIGERIA

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### Abstract

*Economic recession in Nigeria has affected several sectors in Nigeria, let alone education. Short falls in funding has become the order of the day in various institutions of learning there by crippling teaching and learning activities. This paper reiterates the significance of improvisation in safe guarding smooth running of teaching and learning in schools, most especially science and technology which are the bedrocks of national development. We enlightened more on the position of improvisation in providing substitutes to original materials in the event of inadequacy. The paper proved that with improvisation, locally made materials can be used as alternatives to achieve the desired teaching and learning objectives. It also proved that improvisation is a source of income to schools provided the produced materials are marketed. The paper also highlighted some challenges of improvisation and gave some recommendations to salvage the financial situation in institutions of learning in Nigeria.*

**Keywords:** Improvisation, economic crisis, science and technology

### Introduction

Teaching and learning of science and technology to achieve national development demands great financial commitment. This is because education is among the most expensive enterprises in the world that has to be adequately funded in order to ensure quality and sustainability. It is unfortunate that the current tornado of global economic crisis experienced by several countries including Nigeria has already engulfed the sector. Even though before this crisis, Nigeria was unable to meet the UNESCO minimum budget allocation recommendation of 25% annual budget to education, which over the years has been causing several damages to the quality of education in the country. In addition to such problem, there came about the current economic recession that worsened the situation in the state. Educational activities at primary, secondary and tertiary levels have been experiencing retardation and set back due to shortfall in funding.

The destructive power of economic crises in any given society can never be over estimated. For example, Ochu (2010) highlighted the challenges faced by the developing countries including Nigeria to be rooted to political, social and economic factors. To further buttress on this, administration and leadership is affected, provision of social services is slowed down which include education, and general funding is also grossly affected which is the first and the most affected area. Bamigboye and Adeyemi (2016) explained economic crisis in Nigeria to have led to depletion of stocks, loss of investment and jobs due to constant shutdown of companies, devaluation of naira and poor funding of education among others.

### How Does Economic Crisis Affects Education

Economic crises is a phenomenon that affects all aspects of development in a country, developed or underdeveloped. Many countries of the world have experienced this phenomenon and many more are still experiencing, example is Nigeria (Bamigboye & Adeyemi, 2016). Places like Brazil, Costa Rica, Senegal, Tanzania and Zimbabwe to mention but a few have also experienced the epidemic recently that caused them several setback but after some time were able to overcome it (Tichauna & Thembinkosi, 2013). In this regard, Nigeria can be optimistic in recovering from the economic meltdown particularly through adapting some measures taken by such previously affected countries.

However, it is worthy to note that any country that fell in to economic recession is bound to face the

following challenges as outlined by Samoff, (1999) in Tichauna and Thembinkosi (2013) :-

1. Reduction in spending across all expenditures
2. Reduced access to quality of education
3. Reduction in on supplies of instructional materials and stationeries in offices , schools and shortage of staff
4. Delayed salaries and in worst cases freezing of salaries
5. Lower paid teachers get employed and hired due to shortage of funds to cater for qualified teachers
6. Reduced expenditure on construction, maintenance and students' support services which vehemently affect teaching and learning environment

According to a study by Tichauona and Thenbinkosi (2013) on impacts of economic crises on education in Zimbabwe, lack of resources due to the collapse of economy was the most outstanding effect discovered. Also from their findings, there were infrastructural decay in the institutions, mismanaged public examinations which eroded quality of certification and drop-out of teachers from teaching as a result of problem of payment of salary.

In Nigerian situation, however, studies revealed several drawbacks as relates to the effects of economic crises. For example, Leghara and Mbah (2010) disclosed that as a result of economic crisis in Nigeria, high prices of teaching equipments and materials make them inaccessible to many schools due to high rate of foreign exchange. Furthermore, another consequences of economic meltdown on education identified in Nigeria include reduced government allocation affecting the release of grants , payment of teachers salary, provision of educational resources, staff training services and rehabilitations of structures (Bamigboye & Adeyemi, 2016).

If we continue to buttress much on the impact of economic crises particularly as it relates to teaching of science and technology, space may not be enough. Another obvious effect can be seen in the current consistent increase in school and tuition fees in various institutions of learning. as a result of the current short fall in grants, several institutions decided to divert the effect to the public by creating and increasing fees in order to augment the shortage in grants.(Odufowokan, 2007)

#### **Improvisation as the Solution to Inadequacy of Instructional Facilities**

For effective teaching and learning of science and technology disciplines, there is every need adequate instructional materials and equipments. In the event of shortfall of funds, alternatives must be explored in order to safe guard the learning and teaching activities. Several studies have confirmed that the use of instructional materials in teaching enhances teaching and learning processes (Nzewi & Nwosu,2009). Thus if instructional materials and equipments are lacking or inadequate, consequently unproductivity among teachers and students may set in. This underscores the need for putting all hands on desk to provide alternatives to smoothen educational activities in schools.

Improvisation is all about adapting to the use of local resources in to teaching and learning processes most especially in the event of unavailability or lacking of the standard facilities. Fajola (2008) defined improvisation as the process of using alternative resources for enhancing science teaching in the absence or shortage of the real ones. Improvisation enables provision of alternative learning materials for students and helps in supplementing verbal information with observable and concrete objects to facilitate learning.(Folorunso, 2004). The use of improvised instructional materials for science and technology teaching has long been advocated for even by the National Policy on Education. According to the FRN(2004) policy, teaching should be practical, exploratory and experimental to enable learners acquire creative and scientific skills. These skills will make learners capable of creating and producing materials, equipments and other learning resources particular when they are inadequate or even lacking. Chukwunke (2005) maintained that if science is to be taught well, then it has to be practical in order to enable learners use certain tools, produce equipments, make and record accurate observation as the case may be. Acquisition of scientific skills will therefore, boost learners ability to, create improvise so that above all become self reliant. Therefore the situation in Nigerian institutions of learning is seriously in need of improvisation as to avert the effects of the unstable and inadequate grants posed by the economic recession.

### What to be Considered During Improvisation

In an attempt to improvise any material or equipment for teaching and learning, certain factors need to be considered, which include:-

1. Who will be making the needed material, is it teachers or students or both?
2. The time frame, effort and skills needed
3. The basic knowledge of the improvisation
4. The steps involved in the improvisation
5. teacher-student's interaction is very necessary
6. Teacher's innovativeness, resourcefulness, curiosity, creativeness are all paramount to improvisation
7. Availability, accessibility and collection of materials necessary for improvisation are vital
8. Safety and durability of the needed materials also necessary
9. Working and storage spaces must be considered
10. Active participation and involvement of learners and their motivation are paramount

### Major Challenges In Improvisation

As every aspect of life, improvisation is not without challenges that is capable of affecting its success. Basically, there are two categories of problems associated with improvisation, which are technical and human problems. Technical problems encompass all techniques, procedures in the process of improvisation. Some technical problems pose challenges to the degree of accuracy that can be achieved with the improvised materials and equipments which is more evident at secondary and tertiary levels where experiments and observations are carried out. Another technical problem is based on the usability of the improvised materials. For example, how simple or difficult, clean or dirty, comfortable or uncomfortable, longer or shorter, appropriate or inappropriate ... are the improvised materials compared to the standard ones? The major target is to provide materials and equipments that will function as the standard ones in order to achieve the set goals of teaching and learning.

On the other hand, the human challenges are associated with individual 's traits as regards to improvisation, which include teacher's professional commitments, creativity, technical skills and competence. Ivowi (2006) raised some questions on this aspect, and the questions are whether the teacher is willing to abandon all practical works in the absence of original materials and equipments? The second question was that can the teacher think of adequate substitutes for at least some of the pieces of apparatus? Also is the teacher willing to weigh the instructional materials 'values of pieces of apparatus both in terms of instructional outcomes and especially range of possible alternatives and costs?

Another challenge that is human is the attitude of teachers, students and administrators towards improvisation. Some individuals have the habit of disliking anything local, but preferring anything imported from overseas. This makes some teachers and students become reluctant to any process of improvisation and school administrators adamant to financing improvisation activities in schools. By so doing, the burden of spending on the improvisation is left in the hands of teachers and students which makes things difficult and unsuccessful.

### Conclusion

The significance of improvisation as regards to the period of economic recession can never be over emphasized. Improvisation will help provide the substitute materials and equipments for teaching and learning science and technology to be consistent and stable regardless of the condition of funding. With improvisation, teachers and students will become more creative and productive in extension, be able to generate more income to schools to augment shortfalls in funds.

### Recommendations

The following are the recommendations based on this discourse:-

- i. More emphasis should be laid on improvisation of materials in schools
- ii. Managements and authorities in the institutions of learning should be organizing workshops on improvisation to acquaint their staff with the current trends of improvisation
- iii. Substantial reward should be awarded to staff and students who improvise materials and equipments for teaching and learning in schools
- iv. School administrator should link with local manufactures and companies to add values to the improvised materials and equipments in order to generate income

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