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# PROBLEMS OF IMPROVISING INSTRUCTIONAL MATERIALS FOR THE TEACHING AND LEARNING OF PHYSICS IN AKWA IBOM STATE SECONDARY SCHOOLS, NIGERIA

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**ABSTRACT:** *This study 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. All Physics teachers currently teaching Physics in the state formed the population for the study. This gave the population size of three hundred and ten Physics teachers. Random method of selection was used in selecting 150 (80 male and 70 female) Physics teachers to form the sample for the study. A structured questionnaire called Improvised Physics Instructional Materials Questionnaire (IPIMQ) was used in generating the data for the Study. The instrument had two sections, A and B. Section A sought information on personal data (sex and educational qualifications) of the respondents while Section B sought information on problems faced by Secondary School Physics Teachers in the course of improvising instructional materials. The reliability coefficient of the instrument determined using Crombach Alpha was 0.78. One research question and two research hypotheses were formulated to guide the investigation. Mean and t-test statistics were used in analyzing the data. The findings of the Study revealed the 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. Recommendations were made, among others, that Seminars and workshop on improvisation be organized for Physics teachers in Secondary Schools in Akwa Ibom State by the authorities concerned.*

**KEYWORDS: Instructional Materials, Teaching and Learning Physics, Akwa Ibom State, Nigeria**

## INTRODUCTION

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, 2002). 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, 2000). Successful implementation of any curriculum is almost fully dependent on the quality and quantity of instructional materials available to teachers and students for use



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in schools (Usman and Adewunmi, 2006). Instructional Materials is used as checks to the teachers' knowledge and means of transmission. They give teachers the air of guidance, co-ordination, supervision and more time for correction in the class lesson.

Physics as a field of study has a controlling influence over people's lives. The study of Physics also enables man to understand the physical and natural process. Physics as a subject is taught in Secondary Schools in Akwa Ibom State where Government runs free education from Primary School to Secondary School and indeed in Nigeria in general, according to the National Policy on education (FRN:2000). The teaching of this subject in Akwa Ibom State Secondary Schools is always faced with many challenges. Some of these challenges include lack of qualified teachers, lack of standard equipment, lack of appropriate instructional materials and lack of incentives from School Administrators. The situation is pathetic in the last three years since Secondary education in the State was declared free and compulsory. What this free and compulsory education means is that the class size at every level of Secondary School education is not less than 80 students as against the normal or standard size of 40 students.

Instructional materials have been defined and explained in several ways. Eniayeju (2005) explained instructional materials as materials which provide concrete experiences which a learner needs in order to develop intellectually. They are also defined as materials capable of achieving the objectives of the concept to be taught (Adebimpe, 2005). Researchers like Eshiet (2001), Bassey (2002) and Nwosu (2002), have observed that there are inadequate instructional materials for the teaching and learning of Physics in Public Secondary Schools in Akwa Ibom State in particular and Nigeria in general. Teachers have to source for them. This act of sourcing for instructional materials when the standard ones are not available is improvisation (Eshiet, 2001). He explained improvisation with respect to Science teaching 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.

**Statement of Research Problem**

In spite of the emphasis on the use of instructional materials in the teaching and learning processes, it has been observed that Secondary School Physics teachers in Akwa Ibom state teach the subject without instructional materials for the simple fact that they are not available in schools. This observation has posed a serious constraint in the teaching and learning of Physics in Secondary Schools in the State. This observed problem can be attributed to a number of factors such as lack of financial support from the School Principals, lack of skills and strategies for improvisation and large class size arising from free and compulsory Secondary education in the State. Other factors include time constraint, school location where most Secondary Schools are located in rural areas of the State, unavailability of producer goods or tools, inability to identify local materials and lack of exposure on improvisation on the part of Physics teachers. It is therefore the problem for this study to provide empirical data to these perceived problems.

**Purpose of the Study**

The purpose of this study was to identify the constraint of Physics teachers on improvisation of instructional materials for the teaching and learning of Physics in Secondary Schools in



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Akwa Ibom State. Secondly, the Study aimed at determining whether these constraints or problems are location and gender based.

**Research Question:**

1. What problems do Secondary School Physics teachers encounter in the process of improvising instructional materials?

**Research Hypotheses:**

1. There is no significant difference between rural and urban Secondary School Physics teachers in their mean responses on perceived problems of improvisation of instructional materials.
2. There is no significant difference between male and female Secondary Physics teachers in their mean responses on perceived problems of improvisation of instructional materials.

## METHODOLOGY

The design of the study was survey design. One hundred out of two hundred and twenty five secondary schools in the State were randomly selected for the study. All the University trained Physics Education teachers in the schools selected formed the sample for the study. This gave a sample size of one hundred and fifty (80 male and 70 female) Physics teachers. The instrument, Improvised Physics Instructional Materials Questionnaire (IPIMQ) was used for data collection. The Questionnaire was made up of two sections, A and B. Section A sought information on personal data (sex and educational qualification) while Section B sought information on problems encountered by teachers in improvising instructional materials for the teaching and learning of Physics. The instrument was an 8-item Questionnaire based on a 4-point rating scale thus: Strongly agree was scored 4 point, Agree was scored 3 points, Disagree was scored 2 points and strongly disagree was scored 1 point. This 4-point rating score gave a based-mean of 2.5. An item in the questionnaire was therefore considered a constraint to improvisation if the mean of the respondents on it was 2.5 and above, but if the mean of the respondents on it was below 2.5, it was not considered as a constraint to improvisation by Physics teachers. The instrument was face validated by experts in Test and Measurement in University of Uyo, Uyo and was trial tested on twenty Physics teachers who were not part of the sample for the study but within the population for the study. The reliability coefficient of the instrument determined using Crombach Alpha was 0.78. This coefficient reliability of 0.78 shows that the instrument was reliable and could therefore be used for the study.

## RESULTS

**Table 1: Mean and Standard Deviation Results on the Problems faced by Physics teachers in improvisation of instructional materials**

| No | ITEM | $\bar{X}$ | SD | Decision |
|---|---|---|---|---|
| 1 | Financial constraints | 3.75 | 0.37 | Accepted |
| 2 | Lack of Skills and strategies on improvisation | 2.84 | 0.53 | Accepted |
| 3 | Large class size | 3.04 | 0.46 | Accepted |
| 4 | Time Constraint | 3.10 | 0.44 | Accepted |



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| | | | | |
|---|---|---|---|---|
| 5 | School location | 3.02 | 0.46 | Accepted |
| 6 | Unavailability of tools | 2.82 | 0.53 | Accepted |
| 7 | Inability to identify local materials | 1.82 | 0.65 | Not Accepted |
| 8 | Lack of exposure on improvisation | 2.62 | 0.51 | Accepted |

Table 1 provides the answer to research question 1. It was found that Physics teachers have problems in improvising instructional materials in Secondary Schools in Akwa Ibom State, Nigeria. The problems encountered were identified as financial constraints lack of skills and strategies on improvisation, large class size, time constraint, school location, unavailability of tools and lack of exposure on improvisation.

**Testing Of Hypotheses**

**Hypothesis 1:** There is no significant difference between rural and urban Secondary School Physics teachers in their mean responses on perceived problems of improvisation of instructional materials.

**Table 2: t-test Analysis of the mean responses on problems faced by Physics teachers during improvisation based on location**

| No | SOURCE OF VARIATION | N | $\bar{X}$ | SD | df | t-cal | t-crit | Decision at P < 0.05 |
|---|---|---|---|---|---|---|---|---|
| 1 | Financial Constraints: Urban Vs Rural | 85 | 3.67 | 0.31 | 148 | 1.02 | 2.05 | Retain $H_0^1$ |
| | | 65 | 3.83 | 0.39 | | | | |
| 2 | Lack of Skills & Strategies on Improvisation: Urban Vs Rural | 85 | 3.64 | 0.30 | 148 | 1.18 | 2.05 | Retain $H_0^1$ |
| | | 65 | 2.04 | 0.42 | | | | |
| 3 | Large class size: Urban Vs Rural | 85 | 2.54 | 0.29 | 148 | 1.62 | 2.05 | Retain $H_0^1$ |
| | | 65 | 3.54 | 0.34 | | | | |
| 4 | Time constraint: Urban Vs Rural | 85 | 2.60 | 0.38 | 148 | 2.01 | 2.05 | Retain $H_0^1$ |
| | | 65 | 3.60 | 0.42 | | | | |
| 5 | School Location: Urban Vs Rural | 85 | 2.52 | 0.32 | 148 | 1.82 | 2.05 | Retain $H_0^1$ |
| | | 65 | 3.52 | 0.41 | | | | |
| 6 | Unavailability of tools: Urban Vs Rural | 85 | 2.22 | 0.42 | 148 | 0.82 | 2.05 | Retain $H_0^1$ |
| | | 65 | 3.42 | 0.52 | | | | |
| 7 | Inability to Urban | 85 | 2.64 | 0.62 | 148 | 2.14 | 2.05 | Reject $H_0^1$ |



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|---|---|---|---|---|---|---|---|---|---|
| | Identify Local Materials: | Vs | 65 | 1.60 | 0.48 | | | | |
| 8 | Lack of Exposure on Improvisation: | Urban Vs Rural | 85 | 2.90 | 0.57 | 148 | 1.82 | 2.05 | Retain $H_0^1$ |
| | | | 65 | 2.34 | 0.63 | | | | |

Table 2 showed the analysis of the mean responses of both urban and rural Physics teachers on the problems encountered in the process of improvisation of instructional materials for Physics classroom teaching. The results revealed t-calculated values in all the perceived problems to be less than the t-critical values except in inability to identify local materials. This implies that hypothesis one is retained in all the perceived problems faced by Physics teachers in both urban and rural schools except in the problem of inability to identify local materials. This means that Physics teachers in Akwa Ibom State faced the same problems in sourcing for local instructional materials irrespective of their location except in the problem of inability to identify local materials.

**HYPOTHESIS 2:**
This hypothesis states that there is no significant difference between male and female Secondary School Physics teachers in the mean responses on perceived problems of improvisation of instructional materials

**Table 3: t-test Analysis of the mean responses on problems faced by Physics teachers on improvisation of Instructional Materials based on gender**

| No | SOURCE OF VARIATION | | N | $\bar{X}$ | SD | df | t-cal | t-crit | Decision at P < 0.05 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Financial Constraints: | Male Vs Female | 80 | 3.67 | 0.31 | 148 | 1.11 | 2.05 | Retain $H_0^2$ |
| | | | 70 | 3.28 | 0.32 | | | | |
| 2 | Lack of Skills and Strategies on Improvisation: | Male Vs Female | 80 | 2.84 | 0.32 | 148 | 1.12 | 2.05 | Retain $H_0^2$ |
| | | | 70 | 2.80 | 0.44 | | | | |
| 3 | Large class size: | Male Vs Female | 80 | 3.34 | 0.30 | 148 | 1.17 | 2.05 | Retain $H_0^2$ |
| | | | 70 | 2.74 | 0.31 | | | | |
| 4 | Time constraint: | Male Vs Female | 80 | 3.28 | 0.35 | 148 | 1.28 | 2.05 | Retain $H_0^2$ |
| | | | 70 | 2.92 | 0.45 | | | | |
| 5 | School Location: | Male Vs Female | 80 | 3.32 | 0.31 | 148 | 1.62 | 2.05 | Retain $H_0^2$ |
| | | | 70 | 2.72 | 0.42 | | | | |
| 6 | Unavailability of tools: | Male Vs Female | 80 | 3.22 | 0.46 | 148 | 1.72 | 2.05 | Retain $H_0^2$ |
| | | | 70 | 2.42 | 0.48 | | | | |
| 7 | Inability to Identify Local | Male Vs | 80 | 1.80 | 0.64 | 148 | 2.20 | 2.05 | Reject $H_0^2$ |


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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Materials: | Female | 70 | 2.70 | 0.44 | | | | |
| 8 | Lack of Exposure on Improvisation: | Male Vs Female | 80 | 2.70 | 0.62 | 148 | | 2.05 | Retain $H_0^2$ |
| | | | 70 | 2.54 | 0.57 | | | | |

Table 3 showed the results of the t-test analysis of the mean responses on perceived problems faced by both male and female Physics teachers during improvisation of instructional materials at 0.05 level of significance. The results showed the null hypothesis two being retained in all the perceived problems faced by both male and female teachers during improvisation of instructional materials except on item 7 problem where t-cal (2.20) was greater than t-crit (2.05). What this results means is that there is no significant difference in the mean responses of male and female Physics teachers on items 1, 2, 3, 4, 5, 6 and 8 (Problems faced during improvisation of instructional materials). The result further showed a significant difference in the responses of male and female teachers on problem number 7 (inability to identify local materials).

## DISCUSSION

The study has indicated same problems faced by secondary school Physics teachers in Akwa Ibom State during improvisation of instructional materials. The problems identified are financial constraints, lack of skills and strategies on improvisation, large class size, time constraint, school location, unavailability of tools and lack of exposure on improvisation. The findings of this study also showed that Secondary School Physics teachers, irrespective of gender or location in Akwa Ibom State do not have problems of identifying local materials for improvisation of instruction materials. That is, gender and location of teachers do not constitute any constraint during improvisation of instructional materials. The study further showed that Physics teachers in Akwa Ibom State, whether male or female, from urban or rural face the same challenges during improvisation of instructional materials. The reason for the observed challenges faced by Physics teachers during improvisation of instruction materials is caused by nonchalant attitude to work by Public Servants including teachers in the State Public Service. This stems from irregular payment of salaries and poor financial support to Secondary Schools by the State Government. The results of the study on problems of improvisation of instructional materials agreed with the findings by Eshiet (2001); Igwe, Arop and Ibe (2013) which revealed that the problems teachers have in improvisation of instructional materials relate mostly to their failure to give thought on what to construct, functionality and precision of the instructional materials, motivational and financial problems.

## CONCLUSION AND RECOMMENDATION

The findings of this study showed that Secondary School Physic teachers in Akwa Ibom State face difficulties during improvisaton of instructional materials. These problems are not gender or school location sensitive. Based on the findings of this study, it is recommended as followed:



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1. The State Government should sponsor all Physics teachers to attend seminars and workshop on the improvisation of instructional materials.
2. Attendance at such seminars and workshop should be made compulsory for all Physics teachers as this will expose them to available local materials, skills and strategies needed for improvisation. This attendance should be used as one of the criteria for promotion and appointment as Secondary School Principals.
3. The Government in the State should make financial provision for improvisation of instructional materials since it is very clear that she is unable to provide enough standard instructional materials for the increased student in-take.

## CONCLUSION

The short supply or absence of standard instructional materials in schools has been the bane to fulfilling Physics teaching-learning process. Furthermore, some of the few standard instructional materials available do not reflect the local background of students for easy comprehension. This therefore calls for improvisation process as part of the role of Physics teachers. In view of the findings of this study it is hope that the implementation of the recommendation would restore the dignity of Physics teaching and learning in Secondary Schools in Akwa Ibom State in particular and Nigeria at large.

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