



## **Material Resources Management for Effective Teaching and Learning in Nigerian Tertiary Education: Implications for Quality Tertiary Education Delivery**

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### **ABSTRACT**

The poor management of material resources is manifested in the large number of obsolete and unserviceable equipment prevalent in school stores. The outcome of inappropriate management of material resources is dearth of functional tools and equipment and this cripples effective teaching/learning and students' acquisition of deserved skills. This study was carried out to determine material resource management for effective teaching/learning in tertiary education in South-South States of Nigeria. Three research questions were developed and answered. Three null hypotheses were formulated and were tested at 0.05 level of significance. The population of the study is 42 persons. The sample size of the study is still 42 persons. This is because of the manageability of the population size. The data collected were analyzed using mean to answer the research questions and t- test statistics to test the null hypotheses. The findings of the study showed that all the 50 items of the questionnaire on planning, organizing, controlling and coordinating were agree by respondents as needed in management of material resources for effective teaching/learning in tertiary education. The results of the null hypotheses tested revealed that there was no significant difference in mean responses of the respondents on the planning, organizing, controlling and coordinating strategies for proper management of material resources for effective teaching/learning in tertiary education. The study recommended that government through the ministry of education should organize workshop on the findings of this study for lecturers and instructors to enhance their knowledge and skills on management of material resources. Also, in the educational administrators in the state should ensure that lecturers are skilled in planning, organizing, controlling and coordinating of the use of material resources tertiary education in the state. School administrators should be encouraged to develop methods of prudent material resource management to increase their efficiency in tertiary education.

**Key words:** Material Resource, Management, Effective Teaching, Tertiary Education, Quality Education

### **INTRODUCTION**

Education is unarguably a useful instrument in the hands of the society to help meet her need and aspiration, and also an indisputable positive bearing her economic growth and poverty alleviation. Tertiary education contributes to social and economic development through four major missions:-The formation of human capital (primarily through teaching);-The building of knowledge bases (primarily through research and knowledge development);-The dissemination and use of knowledge (primarily through interactions with knowledge users); and-The maintenance of knowledge (inter-generational

storage and transmission of knowledge).The tertiary education or institution is commonly referred as higher education.

Higher Education covers all organized learning activities at the tertiary level. The Nigerian National Policy on Education (2004) defined tertiary education to include, universities, colleges of education, polytechnics and monotechnics. According to the Nigerian National Policy on Education, the major objectives of tertiary education were: a) To contribute to national development through high-level relevant manpower training. b) To develop and inculcate proper values for the survival of the individual and society. c) To develop the intellectual capability of individual to understand and appreciate their local and external environment. d) To acquire both physical and intellectual skills which will enable individuals to be self-reliant and become useful members of the society. e) To promote and encourage scholarship and community services. f) To forge and cement national unity; and g) To promote national and international understanding and interaction. Basically, in Nigeria, higher education is synonymous with the universities, the colleges of education and the polytechnics. Higher education in the country is currently provided by both private individuals and agencies such as religious organizations and the states and the federal governments.

These resources are of great important to teaching and learning. This involves facilities that are used to develop and add value to people. It includes physical assets like laboratories, libraries, instructional tools, writing materials, classrooms, etc used to develop student academic performance. Material resources are also seen as physical resources utilized by educational institutions in the process of implementing educational programmes. They act as ancillaries for the achievement of educational goals and objectives. Educational material resources are the integral part of a well-organized school system. It could be understood to be any material which is used to facilitate the overall teaching and learning process in schools. They include textbooks, visual aids, charts, maps, laboratories equipment, chalkboard/whiteboard, playground and other materials applicable in education system.

Usman (2016) sees material resources as the tangible resources that can easily be seen and observed in any educational institution, such as classroom, staff office, vehicles, health centres, library, laboratories, instructional facilities and so on which directly or indirectly contributes to the achievement of educational goals and objectives. The school system may not attain its set out goals without proper management of materials resources No school can operate in a vacuum, the buildings, furniture, teaching aids, and several other materials are needed before a school can be said to be operational. However, the term school plant management is often adopted by most school administrators without adequate knowledge of the complexities involved Knezevich (2006) explained that school plant does not necessarily mean the school buildings alone, it is the provision of safe structure, adequate sanitary facilities, adequate shelter, balanced visual environment, appropriate thermal environment, room for work and play, the various types of equipment and materials on hand in school, the size of the learning classroom within the school building, as well as the nature of the classroom environment. All of these constitute the focus the material resource management in a school. Material resource management is therefore the process of ensuring that building and other technical systems support the operations of the organization. In most Nigeria public schools especially the primary and secondary, it is a common sight to see chairs and tables littered everywhere in the school premises, broken windows and doors, dilapidated buildings with cracked walls and leaking roofs, exposed electrical fittings, unkept bushes and lawn as well as a picture of total neglect of the school facilities.

### **Statement of Problem**

Despite the efforts of government and non-governmental organisation in provision of school materials or resources, there is still problems in the management of the resource or materials. Some of the tertiary education management lack the managerial strategies in managing the materials resources in teaching and learning. Lack of control, proper planning, lack of organisational skills and coordinating skills have hindered effective management of material resources for teaching and learning in tertiary education delivery.

### **Purpose of the Study**

The main purpose of the study is to examine material resources management for effective teaching and learning in Nigeria tertiary education: implications for quality tertiary education delivery. The specific objectives are to:

1. Identify the planning strategies needed for proper management of material resources in teaching and learning in tertiary education.
2. Examine the organisational strategies that will help in the management of material resources for effective teaching and learning in tertiary education
3. Determine the controlling strategies needed for proper management of material resources for effective teaching and learning in tertiary education.

### **Research Questions**

The study answered to the following research questions.

1. What are the planning strategies needed for proper management of material resources in teaching and learning in tertiary education?
2. What are the organizational strategies that will help in the management of material resources for effective teaching and learning education?
3. What are the controlling strategies needed for proper management of material resources for effective teaching and learning tertiary institution?

### **Hypotheses**

The following null hypotheses were formulated to guide the study and was tested at 0.05 level of significance.

- Ho<sub>1</sub>:** There is no significant difference in the mean responses of lecturers and instructors of higher education, on the planning skills needed for proper management of material resources.
- Ho<sub>2</sub>:** There is no significant difference between the means responses of lecturers and instructors of higher education, on the organization skills that will help in management of material resources for effective teaching/learning in tertiary in education.
- Ho<sub>3</sub>:** There is no significant difference between the mean responses of lecturers and instructors on the controlling skills needed for management of material resources for effective teaching and learning in higher education.

### **Conceptual Framework**

#### ***Tertiary Education in Nigeria***

In the current National Policy on Education according to Federal Government of Nigeria (2004), defined tertiary education to include, universities, colleges of education, polytechnics and monotechnics. According to the Nigerian National Policy on Education, the major objectives of tertiary education were: a)To contribute to national development through high-level relevant manpower training. b)To develop and inculcate proper values for the survival of the individual and society. c)To develop the intellectual capability of individual to understand and appreciate their local and external environment. d)To acquire both physical and intellectual skills which will enable individuals to be self-reliant and become useful members of the society. e)To promote and encourage scholarship and community services. f)To forge and cement national unity; and g)To promote national and international understanding and interaction. Basically, in Nigeria, higher education is synonymous with the universities, the colleges of education and the polytechnics. Higher education in the country is currently provided by both private individuals and agencies such as religious organizations and the states and the federal governments. The scope and importance of tertiary education have changed significantly. Over 40 years ago tertiary education, which was more commonly referred to as higher education, was what happened in universities. This largely covered teaching and learning requiring high level conceptual and intellectual skills in the humanities, sciences and social sciences, the preparation of students for entry to a limited number of professions such as medicine, engineering and law, and disinterested advanced research and scholarship. Teaching and learning at this level of education is more effective with special materials resources different from those of the primary and secondary schools.

### **Material Resources for Tertiary Education**

Instructional materials are needed to convey ideas to the children to enhance their understanding (Caples, 1996). Instructional materials are the basic components in teaching at all levels of education, especially higher education. They help the students to understand what is being taught when they see and handle the object itself Shankar (2008). The materials resources provide opportunities for students to broaden and deepen their knowledge by providing a variety of firsthand, developmentally appropriate experiences and by helping students acquire symbolic knowledge through representing their experiences (Allison, 1999). According to Croft (2000) a visual presentation of an idea or a concept using pictures, charts and models helps the students to develop mental images of the object that the lecturer is talking about. Material resource management has a great role for the achievement of educational goals by providing quality service and optimizing profitability through effective and efficient utilization of it. According to Edoze [9], effective and efficient materials functions contributes to the improvement of performance, leads to a significant reduction in the total materials cost, and helps to enhance the profitability of schools.

### **Concept of Management of School Materials Resources**

The material management concept is based on the potential advantages to be obtained from controlling the flow of materials and goods from supplier through stores and production to dispatch. The overall control would thus embrace purchasing, stores, Inventory control, production planning, and physical distribution [1]. UNESCO (1994) also affirmed that material resource management in schools is a specific activity of school administration to achieve positive end results. The material resources in the higher education are the instructional materials such as writing materials, the tables, chairs, boards, books, indoor and outdoor games, the classrooms, the play field and other infrastructural facilities in the school. Material resources management in higher education involves a coordinated effort to effectively manage the available material resources in the school to promote learning through careful planning, organizing, controlling and evaluation of available material resources in the school. Ehiamentolor (2003) identified the required material resources in higher education to include equipment, buildings, money and instructional materials. The application of appropriate management techniques in material resource management would assist in taking care of all available facilities (Aigboje, 2007). In other words, facilities which might have suffered neglect as a result of carelessness, ignorance, lack of commitment and lack of resources for management of the preschool teachers would be pruned to damage. Also, material resources which are well managed are likely to be durable (Ojedele, 2004). This will save us the cost of replacement within a short period of procurement. In addition, there would be safety from danger, disaster and theft when material resources in schools are well managed. Key concepts in material resource management in schools according to Abdulkareem and Fasasi (2013) include provision, utilization, maintenance and improvement of educational facilities and material resources. According to Raymond (2003), it is important to achieve organizational goal with acquisition and utilization of the right quality and quantity material resource used to deliver service. Material resource management is common to all types of organization. It is basic, because no organization can operate or survive without it. Thus, the success or failure of any organization depends on the material resource management and utilization. Material resource management is said to be that, process of management, which coordinated, supervises and excites the tasks associated with the flow of materials to, through and out of an organization in an integrated fashion

### **Maintenance of Educational Material Resources**

The school administrator is often charged with the responsibility of maintenance and replacement of most school facilities depending on the availability of fund. Okafor (2006) noted that material resource management is as important as the human resource management. Material resources in higher education tend to depreciate as soon as they are provided and put into use. Therefore, there is need for maintenance through repair and servicing of components in order to restore their physical condition and sustain their working capacity. Maintenance of the material resources by school administrators in the tertiary education setting enhances performance and durability of the materials for teaching the students. The maintenance of the material resources according to Adebeyeje (2000) are preventive, corrective, breakdown and

shutdown maintenance services. Preventive maintenance occurs regularly by checking and rechecking the available material resource use for educational purposes (Abdulkareem and Fasasi, 2013). Prevention is not only better: it is also cheaper than any other measures, it is proactive in nature. Corrective maintenance involves reactivation or replacement of material resource in order to normalize their performances. When a material or equipment breaks down completely, a major repair or replacement may be needed by the school management (Adeboyeje, 2000).

### **Material Resource Management Skills**

Management according to Tarig (2008) is defined as a process of coordinating work activities so that they are completed efficiently and effectively with and through people. He went further to say that management is a process of planning, organizing, leading and controlling all activities of the organization in pursuit of pre-determined objectives. Davis (2007), listed management functions to include: planning, organizing, leading or motivating, coordinating and controlling. Management in the context of this study is the act of planning, organizing, controlling and coordinating the activities in tertiary education in order to achieve its objectives. Material resources for teaching and learning in tertiary institutions cannot be effectively utilized to achieve objectives without proper planning, organization, coordination, and controlling.

#### ***Planning Skills***

Planning skills are central to the improvement of our educational development strategies, tasks and schedules to ensure that stated objectives are achieved. Wanda (2013) stated that planning skills equip the teachers to think ahead and accomplish educational goals. Material resource management in schools starts from the planning for such resources. At the inception of a school, certain basic materials stipulated by government must be available at the school. These facilities must be adequately planned for. The facilities include the impermanent properties and physical infrastructure. The infrastructures are assets rooted in and located on the land belonging to an educational institution and used for educational purposes.

#### ***Organizing Skill***

According to Olaitan, *et al* (1999) the following guides are suggested for organizing new and existing facilities: review the occupational objectives and goals of the programme; list and arrange the learning activities which are meant to take place; examine the equipment and materials necessary for the projected learning activities; determine and arrange the approximate boundaries of each materials desired for the learning activities among others. Nwachukwu (2006) pointed out that the teacher decides which organizing element among those within the chosen system will be most relevant, most meaningful and most useful materials for the specific students who should work and gain experiences using the materials. In order to facilitate progress in classroom instruction, the course of study has to be organized as well. The organization of course of study will enhance students' appreciation of the programme and help in their career choice. The main contribution of organization is that it ensures proper utilization of available materials. It therefore becomes imperative that material resources in tertiary education be effectively organized for instructional delivery through the acquisition of the relevant resource management skills by the administrator.

Arranged to facilitate instructional delivery in such a way that it will be easy for the teacher to teach and the students to learn. The classroom must be arranged in a manner that it will assist the teacher to effectively manage the class. This is important because, time required for instruction will be wasted for class reorganization if the classroom is not well organized. 3. Instructional materials in the classroom have to be organized in such a manner to facilitate easy accessibility to use for instructional delivery. Logical sequences of activities are required in order to effectively organize a preschool classroom and materials for effective instructional delivery.

#### ***Control skill***

Controlling involves seeing that the action is according to specification and taking remedial actions when needed to prevent unsatisfactory results. Movement of materials in school workshop or laboratory should be controlled to avoid loss of materials. Uwaifo and Uwaifo (2009) observed that these materials suffer pilferation in the hands of teachers and students. This is an indication of poor management of material

resources and as rightly stated by Adebisin (2003) that mismanagement of available material resources in tertiary education has aggravated its inadequacy. This implies that effective supervision should be adopted to control the use of materials resources.

#### ***Coordinating Skill***

Coordination is a management function, which results in the integration of the activities of people in the use of facilities and materials and handing the asset of the enterprise to accomplish unified approach to pre-determined goals and objectives. Nwachukwu (2006) stated that coordinating is the task of management whereby the plans and organization are kept under continuous surveillance so that operating efficiency is monitored and difficulties are foreseen. Effective coordination ensures smooth running of a set up. Effective coordination of material resources for teaching/learning in tertiary education will create enabling environment and ensures that all materials are put to use for students acquisition of skills. Oliatan, Nwachukwu, Igbo, Onyemacchi, and Ekong (1999) stated that when tools and equipment are effectively coordinated, the result will be the production of efficient, effective and employable graduates. But Okafor (2007) observed that the university final year students have not acquired enough psychomotor skills needed for self-reliance. The implication is that material resources have not been effectively coordinated to result to the production of employable graduates.

#### **METHODOLOGY**

The study adopted a survey research design. This design was suitable since this study educe information on strategies or skills for management of material resources for effective teaching in tertiary education. The study was carried out in South-South states of Nigeria. The states include; Abia, Akwa Ibom, Cross-River, Delta, Edo, Bayelsa and River States. The study involved tertiary education in these States. The population of the study comprised of 42 respondents (27 lecturers and 15 instructors) in higher education in the South-South states. The population was based on information collected from personnel service unit of each school. The entire population was studied, hence there was no sampling. The data obtained were analyzed by finding the variance of each item of the instrument and variance of the total number of items in each section of the instrument. The variances were used to calculate the alpha co-efficient of the instrument. The result is a co-efficient of his value represented the reliability coefficient of the instrument. The researcher with five research assistants administered and collected the questionnaire. The research assistants were instructed on how to administer questionnaire to ensure high percentage return. Mean was used to answer the three research questions. In calculating the Mean the response categories was assigned numerical values of 5-1 from strongly agree to strongly disagree. The mean of the response category is 3. The lower limit is 2.50 and the upper limit is 3.50. Therefore, any item with the mean of 3.50 and above will be considered agree while those with mean below 3.50 will be considered disagree. This is because 3.50 is the true lower limit of agreeing in the response continuum. The hypothesis was analyzed using t-test at significant level of 0.05 and 40 degree of freedom. The null hypothesis was rejected for items with t-calculated greater than the table value and accepted for t-calculated values less than t-table values.

**RESULTS**

**Research Question One:** *What are the planning skills needed for proper management of material resources in teaching/learning in education?*

**Table 1:** Mean responses of lecturers and instructors on planning skills needed for proper management of material resources in teaching/learning in tertiary education.

S/N	The planning strategies should involve	$\bar{x}$	Remark
1.	Providing adequate funds for the purchase of consumable materials and maintenance of existing facilities.	4.48	Agree
2.	Workshop facilities should be planned based on current students' enrolment	3.57	Agree
3.	Adequate number of tools and equipment should be provided in the workshops and laboratories.	4.45	Agree
4.	Materials and equipment should be located appropriately in the classroom.	4.31	Agree
5.	Equipment and tools should be planned based on the school curriculum.	4.38	Agree
6.	Equipment, tools and materials used in teaching /learning of courses should be planned yearly.	4.21	Agree
7.	Shop stores should be provided for safety of consumables	4.36	Agree
8.	Infrastructures should be located for convenience and safety.	4.21	Agree
9.	Planning the workshop to cater for students practical work in areas of construction of appliances.	4.26	Agree
10.	Deciding the method of storage required for each material used in tertiary education.	4.02	Agree
11.	Material management committee should be set up to comprise of lecturers and instructors	4.33	Agree
12.	Borrower-loss replacement system should be adopted to check losses.	4.00	Agree
13.	Stores should be planned with adequate ventilation, illumination and artificial lighting	4.36	Agree
14.	Maintenance schedule should be developed for regular maintenance of tools and machines	4.36	Agree
15.	Develop and operate within constraints of a budget.	4.19	Agree

Table 1 above revealed that all items on planning skills were rated by the respondents with their means scores ranging from 3.37 to 4.48. This signifies that all the items on planning skills are effective in management of material resources for effective teaching/ education.

**Research Question 2:** *What are the organizational skills that will help in the management of material resources for effective teaching in tertiary education?*

**Table 2:** Mean responses of lecturers and instructors on organizing skills that will help in the management of material resources for effective teaching/learning in tertiary education.  
**Item**

S/No	Organization of material resources should involve	$\bar{x}$	Remark
16.	Equipment should be arranged to facilitate teaching and learning	4.33	Agree
17.	Arrangement of tools and materials before and after use	4.33	Agree
18.	Proper records of all the shop equipment and tools should be kept.	4.33	Agree
19.	Tools and equipment should be used for activities they are designed for	4.36	Agree
20.	There should be regular supervision of material inventories to check losses	4.43	Agree
21.	Safety inspections should be conducted regularly and hazardous condition corrected.	4.48	Agree
22.	Develop a procedure to insure proper laboratory clean up.	4.21	Agree
23.	Equipment in school workshop should be well arranged to enhance safety efficiency, and learning.	4.24	Agree
24.	Procedures to facilitate storage, checkout, and security of tools and equipment should be developed	4.24	Agree
25.	Work stations should be designate and equipping for each skill area such as installation, repairs, maintenance, design and construction.	4.21	Agree
26.	Professional service person should be invited to make major equipment repairs	4.33	Agree
27.	Storing the materials in a lockable cabinet	4.07	Agree
28.	Minor repairs (predictive maintenance) of the facilities should be made to avoid breakdown	4.38	Agree
29.	Equipment should be organized to facilitate movement of people in the workshop	4.26	Agree
30.	Students should be grouped during practical to enhance mastery.	4.19	Agree

Table 2 showed that all the 15 items on organizing skills had their mean scores between 4.07 to 4.48. This indicated that respondents agreed to all the items as important organizing skills for management of material resources for effective teaching/learning in tertiary education.



**Research Question 3:** *What are the controlling skills needed for proper management of material resources for effective teaching in tertiary education?*

**Table 3:** Mean responses of lecturers and instructors on controlling strategies needed for proper management of material resources for effective teaching in tertiary education.

Item			
S/No	Controlling strategies should involve	$\bar{x}$	Remark
31.	Selecting, storing, and maintaining material for student use.	4.26	Agree
32.	Promoting material and environmental safety by colour coding equipment, marking safety zones, and posting appropriate safety signs.	4.38	Agree
33.	An identification system should be used to deter material theft.	4.26	Agree
34.	Students should be guided in the use of appropriate tools, equipment and machine in the school.	4.24	Agree
35.	Lecturer and workshop staff should prepare directives for the use of machines, tools and materials.	4.31	Agree
36.	Maintaining a complete inventory of tools at the end of each class.	4.21	Agree
37.	There should be a competent storekeeper who should be responsible for the security of tools and equipment.	4.31	Agree
38.	Tool loan slips should be given to students and staff who want to borrow any tool/equipment.	4.88	Agree
39.	Accurate inventory of materials in stock should be kept.	4.31	Agree
40.	There should be adequate check to avoid careless loss of material due to pilferation and vandalization.	4.31	Agree
41.	Maintenance and storage material t should be well supervised.	4.29	Agree

Table 3 indicated that all the 11 items on controlling strategies are needed in management of material resources for effective teaching/learning in tertiary education. All the items were rated agree with their mean scores ranging between 3.88 to 4.38.

**Hypothesis 1:** There is no significant difference in the mean responses of lecturers and instructors on the planning activities needed for proper management of material resources.

**Table 4:** T-test analysis of mean rating of respondents on planning skills needed for proper management of material resources for effective teaching in tertiary education.

S/ No	Planning Strategies	$\frac{N_1 = 27}{-2}$ $x_{1S1}$	$\frac{N_2 = 15}{-2}$ $x_{2S2}$	Lecturers	Instructors	t-cal	t-tab	Remark
1.	Providing adequate funds for the purchase of consumable materials and maintenance of existing facilities.	4.25	0.26	4.33	0.24	1.19	2.02	Not Significant
2.	Workshop facilities should be planned based on current student' enrolment	4.19	0.85	4.13	0.12	0.30	2.02	Not Significant
3.	Adequate number of tools and equipment should be provided in the workshop and laboratories	4.52	0.26	4.40	0.26	0.73	20.2	Not Significant
4.	Materials and equipment should be located appropriately in the school	4.41	0.25	4.27	0.21	0.92	2.02	Not Significant
5.	Equipment and materials should be planned based on the curriculum.	4.52	0.26	4.27	0.21	1.64	2.02	Not Significant
6.	Equipment, tools and materials used in teaching/learning courses should be planned yearly.	4.52	0.26	4.47	0.41	0.26	2.02	Not Significant
7.	Shop stores should be provided for safety of consumables.	4.48	0.26	4.40	0.40	0.42	2.02	Not Significant
8.	Infrastructure should be located for convenience and safety.	4.26	0.43	4.33	0.24	-0.39	2.02	Not Significant
9.	Planning the workshop to cater for students practical work in areas of construction of appliances.	4.30	0.29	4.33	0.24	-0.18	2.02	Not Significant
10.	Deciding the method of storage required for each material used in the school.	4.19	0.55	4.00	0.14	1.10	2.02	Not Significant
11.	Material management committee should be set up to comprise of lecturers.	4.41	0.33	4.33	0.24	0.48	2.02	Not Significant
12.	Borrower –loss replacement system should be adopted to check losses.	4.19	0.29	3.60	1.11	2.03	2.02	Not Significant
13.	Stores should be planned with adequate ventilation, illumination and artificial lighting.	4.48	0.26	4.27	0.35	1.16	2.02	Not Significant
14.	Maintenance schedule should be developed for regular maintenance of materials.	4.52	0.26	4.33	0.38	1.02	2.02	Not Significant
15.	Develop and operate within constraints of a budget.	4.04	0.50	4.47	0.27	-2.25	2.02	Not Significant

**Overall 4.38 0.32 4.26 0.36 0.63 2.02 NS**

Degree of freedom = 40; prob of 0.05, t-table = 2.02.

The data presented on table 5 showed that of 15 items in the table, there was no significant difference on all the 15 items, while item 12 showed significant difference on the responses of lecturers and instructors. The overall t-cal for the table is 0.63, which is less than t-table value. Hence the null hypothesis was upheld.

**Hypothesis 2:** There is no significant difference in the mean responses of lecturers and instructors on the organization strategies that will help in management of material resources for effective teaching/learning in tertiary education

**Table 5:** T –test analysis on the mean responses of the respondents on the organization strategies for proper management of material resources.

16.	Organizing strategies	$\frac{N_1 = 27}{-2}$ $x_1s_1$	$\frac{N_2 = 15}{-2}$ $x_2s_2$	Lecturers	Instructors	t-cal	t-tab	Remark
17.	Equipment should be arranged to facilitate teaching and learning.	4.41	0.25	4.27	0.21	0.92	2.02	Not Significant
18.	Arrangement of tools and materials before and after use.	4.44	0.26	4.20	0.17	1.66	2.02	Not Significant
19.	Proper records of all the shop equipment and tools should be kept.	4.48	0.26	4.27	0.21	1.37	2.02	Not Significant
20.	Tools and equipment should be used for activities they are designed for.	4.44	0.26	4.27	0.21	1.11	2.02	Not Significant
21.	There should be regular supervision of inventories to check losses	4.41	0.25	4.47	0.41	-0.37	2.02	Not Significant
22.	Safety inspections should be conducted regularly and hazardous condition corrected	4.52	0.26	4.47	0.27	0.30	2.02	Not Significant
23.	Develop a procedure to insure proper laboratory clean up.	4.30	0.22	4.13	0.55	0.90	2.02	Not Significant
24.	Equipment in school workshop should be well arrange to enhance safety, efficiency, and learning	4.41	0.25	4.33	0.24	0.50	2.02	Not Significant
25.	Procedures to facilitate storage, checkout, and security of tools and equipment should be developed.	4.30	0.22	4.13	0.41	0.90	2.02	Not Significant
26.	Work stations should be designate and equipping for each skill area such as installation, repairs, maintenance, design and construction.	4.19	0.39	4.27	0.50	-0.37	2.02	Not Significant
27.	Professional service person should be invited to make major equipment repairs.	4.52	0.26	4.33	0.24	1.19	2.02	Not Significant
28.	Storing the materials in a lockable cabinet.	4.30	0.37	3.73	1.07	-1.47	2.02	Not Significant
29.	Minor repairs (predictive maintenance) of the facilities should be made to avoid breakdown.	4.37	0.32	4.47	0.27	-0.58	2.02	Not Significant
30.	Equipment should be organized to facilitate movement of people in the workshop.	4.33	0.46	4.20	0.31	0.67	2.02	Not Significant
31.	Students should be grouped during practical session to enhance mastery.	4.37	0.55	4.20	0.31	0.8	2.02	Not Significant

Df = 40

Table 5 showed that all the items had their t-calculated less than t-table. This indicated that there was no significant difference on the mean responses of the two groups. Therefore, the null hypothesis of no significant difference was upheld.

**Hypothesis 3:** There is no significant difference between the mean responses of lecturers and instructors on the controlling skills needed for management of material resources for effective teaching in education.

**Table 6:** T-test analysis on the mean responses of respondents on controlling strategies for proper management of material resources.

S/ No	Controlling strategies	$\frac{N_1 = 27}{-2}$ $\frac{x_1s_1}{-2}$	$\frac{N_2 = 15}{-2}$ $\frac{x_2s_2}{-2}$	Lecturers	Instructors	t-cal	t-tab	Remark
32.	Selecting, storing, and maintaining materials. for student use.	4.33	0.23	4.20	0.31	0.76	2.02	Not Significant
33.	Promoting material and environmental safety by colour coding equipment marking safety zones ,and posting appropriate safety signs.	4.48	0.34	4.33	0.24	0.89	2.02	Not Significant
34.	An identification system should be used to deter material theft.	4.33	0.23	4.20	0.17	0.92	2.02	Not Significant
35.	Students should be guided in the use of appropriate tools, equipment and machine in the school.	4.52	0.26	4.20	0.46	1.59	2.02	Not Significant
36.	Lecturer and workshop staff should prepare directives for the use of machines, tools and materials.	4.41	0.25	4.13	0.27	1.70	2.02	Not Significant
37.	Maintaining a complete inventory tools at the end of each class.	4.07	1.07	4.13	0.98	-0.57	2.02	Not Significant
38.	There should be a competent storekeeper who should be responsible for the security of tools and equipment.	4.41	0.33	4.13	0.27	1.63	2.02	Not Significant
39.	Tool loan slips should be given to students and staff who want to borrow any tool/equipment.	4.33	0.31	4.13	0.41	1.02	2.02	Not Significant
40.	Accurate inventory of materials in stock should be kept.	4.41	0.25	4.27	0.21	0.92	2.02	Not Significant
41.	There should be adequate check to avoid careless loss of materials due to pilferation and vandalization	4.48	0.26	4.20	0.17	1.93	2.02	Not Significant
42.	Maintenance and storage of materials should be well supervised	4.44	0.26	4.13	0.27	1.86	2.02	Not Significant
	<b>Overall</b>	<b>4.38</b>	<b>0.35</b>	<b>4.19</b>	<b>0.33</b>	<b>1.02</b>	<b>2.02</b>	<b>NS</b>

Data presented on table 6 revealed that all the items had their calculated t-value less than table value at 0.05 level of significance. This showed that there was statistically no significant difference on the mean responses of the two groups. The table also revealed that the overall t-calculated is 1.02, which is less than the t-test of 2.02. Therefore the null hypothesis was upheld

### DISCUSSION OF FINDINGS

Based on the findings it was revealed that all the 15 items on planning skills for proper management of material resources were rated agree by respondents. This may be as a result of the importance attached to planning in any management. Planning skills of material resource management are foundation of

management for the attainment of objectives in tertiary education at any reasonable cost. The findings agree with national policy on education (2004) which stated that the success of any system of education hinges on proper planning. Therefore lecturers and instructors in tertiary education should have good knowledge of planning of resources and activities carried out in the school. Such plans from the findings of the study include plans for purchase of tools, machines and other consumable materials that would be needed for developing course outline, unit lessons, learning activities, methods to be used for particular lesson and time required for unit lesson.

The findings of the study was also in tandem with the view of Tarig (2008), who opined that planning provides direction, reduces uncertainty minimizes waste and redundancy and sets the standards for controlling educational activities. To this, teachers and instructors should adopt and implement these skills on planning for the material resources for effective teaching/learning in tertiary education. The experts' opinion cited above helped to justify the findings of the study on planning skills needed in management of material resources for effective teaching/learning in tertiary education. From the study it was found out that 15 items on the organizing strategies were rated agree by the respondents to be effective for proper management of material resources. The findings among others include; arrangement of tools and materials before and after use; students should be grouped during practical sessions to enhance mastery; materials should be stored in cabinet; proper records of all the materials should be kept etc. The findings were in agreement with opinion of Nwachukwu (2006) who stated that organizing represents the way resources connect together to achieve objectives. He elucidated the responsibilities of workshop teacher/instructor in organizing materials resources to include; to arrange all resources in the laboratory in conformity with safety regulations store the materials in a lockable cabinets or open pigeonhole boxes; arrange students into groups for instructions and demonstrations in a small and comfortable area or around a piece of machine; arrange facilities that will enhance security of the laboratory users. Similarly, the finding was in conformity with the view of Okorie (2002) who considered the following principles important for effective organization of material resources, they include: machine and tools should be organized in reference and accountability; proximity to users should be high priority; lost or damage tools should be replaced for continuity of the programme.

The findings also agree with submission of Everard and Geoffery (1985) who stated resources actually present in the school are known and that there is need for keeping up to date inventories which are periodically checked. The implication is that lecturers and instructors should keep up to date inventories of materials that will help to minimize lost and enhance effective teaching and learning in tertiary education. The opinions of the experts cited above helped to justify the findings of the study on organizing strategies needed in management of material resources for effective teaching and learning. The findings of the study on controlling strategies showed that the respondents agree to all the 11 items as needed in management of material resources for effective teaching in tertiary education. The findings among others include; an identification system should be used to deter material theft; students should be guided in the use of appropriate materials in the schools; lecturers and instructors should prepare directives for the use of tools, equipment and materials; there should be a competent storekeeper who should be responsible for the security of instructional materials.

The findings was in consonant with view of Momoh (1998) who stated that managerial responsibilities of controlling resources in teaching/learning involves providing instruction and guiding the use of materials and enhance their maintenance. The findings on controlling strategies was also in conformity with view of Ogbonna (1988) who maintained that someone should be clearly responsible for the control and maintenance of each equipment. The implication from the findings was that the lecturers need the knowledge and skill of controlling to be able to manage material resources effectively and to improve the quality of teaching and learning. The opinions of the experts cited above helped to justify the findings of the study on the controlling skills needed in management of materials resources for effective teaching in tertiary education. From the study it was found out that there was no significant difference in the mean ratings of the responses of lecturers and instructors in higher education on the planning, organizing, controlling and coordinating skills needed in management of materials resources for effective teaching and learning in higher education. Therefore, the null hypotheses of no significant difference in the mean

ratings of the respondent were upheld. The implication of this finding is that it helped to validate the findings on sections B, C, and D and also it implied that the qualifications and professional experiences of the two groups of respondents had no significant influence on their opinion of the planning, organizing, and controlling skills needed in management of material resources for effective teaching and learning in tertiary education.

### **CONCLUSION.**

The scope and importance of tertiary education have changed significantly. Many years ago tertiary education, which was more commonly referred to as higher education, was what happened in universities. This largely covered teaching and learning requiring high level conceptual and intellectual skills in the humanities, sciences and social sciences, the preparation of students for entry to a limited number of professions such as medicine, engineering, law, etc. and disinterested advanced research and scholarship. Teaching and learning in tertiary education is heavily dependent on availability and proper utilization of material resources. Education activities cannot be carried out effectively without material resources which must be adequate in number and quality. The available material resources are poorly managed and this hampers deserved teaching/learning activities in the school. Effectiveness could be achieved in teaching/learning if there should be judicious management of material resources. To make contribution in this direction, the study explore at material resource management strategies for effective teaching in higher education. The study therefore, made the following contribution to knowledge and management of material resources:

1. It has provided information to lecturers and instructors on management strategies for effective teaching in tertiary education.
2. It has provided information on material resource management to different state government in South-South of Nigeria. The information could be package into lecturers and instructors to enhance their effective teaching in higher education.

From the findings that also emanated from the study, it was concluded that the acquisition of the identified skills in planning, organizing, controlling and coordinating the use of material resources in teaching /learning in tertiary education in the state will enhance the achievement of the stated objectives tertiary education in the state

### **RECOMMENDATIONS**

Based on the findings of the study, the following recommendations were made.

1. State governments through the ministry of education should package the management strategies in managing material resources into workshop materials and organize workshop on them for classrooms and workshop in order to impart skills on students.
2. Lecturers and instructors should implement the knowledge gained in the resources material management skills for improving the competencies of teachers and instructors
3. The curriculum planners should emphasize management of material resources in the curriculum of tertiary education through accreditation
4. The educational administrators in the state implement the knowledge gained in the resources material management skills for improving should ensure that lecturers are skilled in planning, organizing, controlling and coordinating of the use of material resources tertiary education in the state.
5. School administrators should be encouraged to develop methods of prudent material resource management to increase their efficiency in tertiary education.

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