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WASTAGE MANAGEMENT IN A PRODUCTION CIRCLE: AN EDUCATIONAL INSIGHT

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Abstract

The study wastage management in a production circle: an educational insight adopted an expost-facto survey design. Four research questions and three null hypotheses guided the study. The population of the study is 642 lecturers' from federal and state universities in south-east Nigeria. The sample size was 311 respondents selected through proportionate stratified random sampling technique representing 50% of the population. Researchers' self-developed questionnaire titled Wastage Management in Production Circle (WAMAPROC) was used for data collection. The instrument was validated by two experts in economics of education and one expert in measurement and evaluation. Cronbach alpha statistics was used to determine the reliability of the instrument which yielded a reliability index of 0.81which is reliable. Data were analyzed using mean rating and z-test to answer the research questions and test the hypotheses at 0.05 level of significance respectively. The result of the analysis indicates that lecturers' from federal and state universities are of the view that effective management is relevant in the control of wastage in the university community to ensure effective teaching outcome since the z-cal. of 0.5312≤ z-crit. Value of 1.96. The study also shows that there is a significant difference on infrastructural wastage and negative teaching and learning outcome since the z-cal. Value of 7.0185≥ the z-crit. Value of 1.96. Based on the findings of the study, the researchers recommended that the school administrators in the universities should have a managerial blue print for management of school facilities used in teaching-learning activities. That effective management towards quality maintenance culture of infrastructure and other facilities in the university community should be encouraged.

Introduction

The school system remains one of the greatest asserts that requires effective management in order to avoid wastage in the education sector. Wastage therefore is linked to mal-handling of school facilities, inability of the teacher to utilize available emergent learning technologies as a result of incompetence, decay of school facilities, lack of maintenance of school plant, dilapidated school buildings, high rate of drop-out caused by poor performance of students and poor utilization of learning resources in the school system. Education therefore remains one of the production industries that uses input to produce quality output if effectively managed. This responsibility of producing quality manpower and resources for efficient restructuring, creativity in the economy, sustainable economy development and industrial expansion in the society becomes a vital role of the educational industry.

Globally, education is the bedrock for quality manpower production and resources utilization geared towards economic transformation, rebranding and productivity that helps in industrial expansion and sustainability. Okunamiri (2009) opined that wastage is

inseparable with efficiency which educational wastage implies inefficiency in the use of educational resources. This view connotes that inefficiency in the school such as poor performance, drop-out rate of students, repeat, inability of the teacher to utilize effectively educational resources, brain-drain remain wastage. This when put differently entails that unutilized educational resources hinders smooth achievement of educational goals. Imperatively, wastage could be said to occur in education system as a result of nature, ability and capacity of both educational personnel and students. This means that the physical environment, nature of available educational resources and labor market may attribute to wastage in educational sector.

Concept of Education Wastage

Wastage is an economics term which is used in the discipline of education to portray various areas of failure in the school system. This could be seen as an aspect of poor manpower productivity, poor classroom facilities, lack of proper utilization of available resources to enhance effective and quality teaching-learning outcome, premature withdrawal by students, repeat of class, drop-out of students as caused by inability to complete course work, death, accident, cost effectiveness of education and mental disorder. This shows that when a child enrolled in a school did not complete his course work as a result of withdrawal, carryover and death at required time, it become wastage in educational world.

Saliently, management of wastage becomes very needful in order to ensure that input in education is commensurable with the output. Management ethics such as organization of resources, planning on how resources can be used judiciously to obtain quality output, budgeting on the resources needed for effective transaction in the system, directing the resources to the appropriate channels through which this resources could be effectively impactful to the system, coordination of both human, material and financial resources in educational system remain an essential element to the management of education sector hence wastage is controlled and managed. Education remains key factor to change and progress of any nation as such the Nigerian government has used this sector as one of the mediums to eradicate illiteracy, poverty and ensure quality workforce production for sustainable economic development.

In education system, it seems that the little investment made by the government in public institutions of learning ranging from basic education to tertiary education have been wasteful as a result of poor management, increase in demand of more structures for learning, poor maintenance culture of available school structure and learning equipment, mal-handling of learning resources leading to damaged facilities, poor deployment of personnel in various schools, dilapidated and nearly collapsed building leaving the classroom, laboratories and library without required equipment to function. It seems that Oyetakin (2011) and Adamu (2000) agreed that wastage is an unprofitable and uneconomical utilization of time and resources. This mean that any resources used in education system that does not yield positive outcome is wasteful. Take for instance a child that enrolls for study at the end/termination of his/her academic stay did not perform well as a result of failure, it become an output that is not efficient as a result of inefficiency of the input, we therefore say that wastage has occurred. Wastage could range from time, finance, strength and even resources for imparting new idea to the learner.

Akindele (2005) and Okunamiri (2009) are in agreement that educational wastage implies inefficient use of educational resources which includes dropout; repeaters' and premature withdrawal of students from school etc. wastage globally could be managed and controlled through effective managerial activities to ensure efficiency in production

circle, education sector in particular. Nwaoku, (2005) see management as a total system of organization that is getting organizational personnel to accomplish their work so as to achieve organizations objectives. Deducing from the view above, management involves the function of policy formulation, planning, controlling, organizing, directing, coordinating and utilization of human and material resources judiciously to achieve the end goal of an organization. Counting on this idea, Peretomode in Afinmagbon and Nwokocha (2011) aptly noted that management is concerned with planning, organizing, and controlling. This makes effective management important trend in wastage control and efficient utilization of resources in the education system. This thus shows that proper management of human, material and financial resources results to efficiency in the system.

Synergy between Wastage and Inefficiency

The synergy between education wastage and inefficiency in the educational system is strong as such inefficiency is the inability of the input in the system to produce desire output. By efficiency we mean an optimal relationship between the input into education and output from the system. Okunamiri (2008) is of the opinion that for an objective of an organization to be achieved, input in terms of human, material and symbolic are made available and combined so as to provide desired output with little effort and cost as possible. Supporting this view, Akpan (2002) view organizational efficiency to entail proper combination of qualified personnel with right attitude, knowledge, skills and sufficient supply of equipment that results in positive transformation of output to input. Notably, were there is no efficiency, the result in output yields wastage that ranges from human to material. The concept of wastage therefore becomes inseparable from the concept of efficiency implying that wastage is an insufficient use of educational resources. Effective organizational outcome remain a product of proper management and effective utilization of human and material resources. Increase in education productivity is geared towards economic, social, political and manpower development is a reflection of effective and adequate managerial activities. High level of poor education management results to wastage as such internal efficiency of the system portrays compliance with standard norms which includes students-teachers ratio, repeat and dropout.

More-so, three aspect of wastage in educational system could be categorized in three dimensions which are:

a. Human Resources Wastage
b. Material Resources Wastage
c. Financial Resources Wastage

Education Cost and Wastage in the School System

Cost of education is another cause of wastage in educational sector. The cost of education purchase is high as such most education clients could not continue with their study as a result of shortage or lack of fund and increase in educational price. Educational cost is made up of recurrent and capital expenditure for the provision of education in the target year can be projected. Capital cost involves expenditure on building, equipment and furniture as the recurrent cost are expenditure on teachers and non-teachers', consumable materials, scholarship and unspecified items. The total money spent by government on the educational sector at times lies waste as a result of inefficiency in the system caused by poor utility of available resources, poor project targeting in terms of wrong selection of emergent learning technologies, shortage of qualified personnel, abandoned educational projects and poor management culture of education sector and its facilities. Okunamiri and Ajoku (2008) opined that in cost benefit analysis, it is one thing to develop a beautiful and grandiose plans and programmes, but another thing is to implement them effectively. These mean that many educational plans have ended up unattained as a result of inadequate

and unskilled personnel to translate this plan activities and programmes to a visible outcome. A considerable numbers of studies carried out on wastage in production circle. Iyiomo and Olufunmilayo (2013) carried out study on cost of educational wastage in Nigerian public universities. 3 federal and 3 state universities were used for the study. Expost-facto design was used for the study. Data generated were analyzed using frequency count, simple percentage and bar graph. The findings show a high percentage wastage in the system as such recommends that management of both human and material resources by the school administration to avoid wastage in education system.

Statement of Problem

One of the major problem faced by the educational system remain poor management strategy to control wastage of human, material and financial resources for teaching and learning activities in various universities in Nigeria. The ideal situation should involve effective managerial activities and utilization of resources to enhance quality maintenance of school resources, planning towards enhancing affordable education in terms of tuition fee, avoidance of high rate of drop out and ensuring efficiency in the system. However, the problem of high rate of student drop out, inadequate teaching workforce, high ratio of teacher-student, poor management of resources, infrastructural damage, premature withdrawal of students in terms of carryover of courses, inability to graduate at the required academic session and high cost of education amongst others are problems that reinvades educational system. The problem of this study thus put in question form; to what extent does effective management influences wastage reduction in a production circle?

Purpose of the Study

The purpose of this study is to ascertain the influence of effective management on wastage control in a production circle. Specifically, the following objectives guide the study they are:

1. To determine the perception of lecturers' on the relevance of effective management on wastage control in public universities.
2. To determine the extent to which wastage of infrastructure influences quality teaching-learning outcome public universities in south-east.
3. To determine the extent of wastage on utilization of teaching workforce influences quality productivity in public universities in south-east.
4. To determine the extent to which students' drop-out rate influences quality manpower production in public universities in south-east Nigeria.

Research Questions

The following research questions guides the study. They are:

1. What are the perceptions of lecturers' on the relevance of effective management on wastage reduction in public universities?
2. To what extent does wastage of infrastructure influences teaching-learning outcome in public universities in south-east Nigeria?
3. To what extent does wastage in teaching workforce utilization hinders quality productivity in education system in public universities in south-east Nigeria?
4. To what extent does students' drop-out rate influences quality manpower production in public universities in south-east Nigeria?

Hypotheses

The following hypotheses were formulated to guide the study and were tested at 0.05 level of significance. They are:

$H0_1$: There is no significant difference on mean response of State and Federal lecturers' perception on the relevance of effective

management and wastage control in public universities in south-east Nigeria.

$H0_2$: There is no significant difference on mean responses of State and Federal lecturers' on wastage of infrastructure and teaching-learning outcome.

$H0_3$: There is no significant difference on mean response of State and Federal lecturers' on wastage of teaching workforce and hindered productivity in education system.

Methodology

This aspect of the study details the procedures and methods used for the study. The study employed ex-post-facto survey design. This design is ideal for conducting social research when it is not possible or acceptable to manipulate the activities of human participants. Kerlinger in Nwakodo and Alum (2010) asserts that expost-facto design is mostly used when experimental research is not possible such as people have self-selected levels of an independent variable or when a treatment is naturally occurring and the researcher could not control the degree of its use.

Population

The population of the study is 624 lecturers' from six faculties of education in the selected universities at study. (Sources: quality assurance office ABSU, www.unn.edu.ng/faculty/staffprofile/octnov/2015,www.unizik.edu.ng/faculty/staffprofile/Decjan/2016, personnel administration office MOUAU,ESUT and ASUT). The study sample size is 311 lectures' selected using stratified random sampling technique. The figure 311 represents 50% of the population. This was done through sampling from various departments in the faculties of education at study. Boll and Gall in Uzoagulu (2011) suggested that for population of 1,000 use 20%, for population of 5,000 use 10% and for population of 10,000 use 5%. Supporting this view, Ali (2013) opined that when a population is not too large, the sample for the study would be within the range of 5-20% of the population. The researcher, therefore choose 50% of the population on the bases that a population of 1,000 that 20% can go.

Instrument for data collection

The instrument for data collection was the researchers' self-developed questionnaire titled Wastage Management in a Production Circle Questionnaire (WAMAPROCQ) was used to solicit information from the respondent. The instrument was face validated by two experts in economics of education and one expert in measurement and evaluation. The essence of the instrument validation by the experts is to scrutinize the instrument in terms of relevance, general test format and clarity of the instrument. The experts' corrections were effected on the questionnaire used for data collection. The reliability of the instrument was determined using cronbach alpha statistics. 20 copies of the questionnaire item were administered to 20 lecturers' in Alvan Ikeokwu College of education owerri which is not part of the study environment. In using cronbach alpha statistics to determine the reliability of the instrument, mean, standard deviation, variance of the total test and computation of variance using substitution mean from each score were obtained. The result of the analysis yielded a reliability index of 0.81 which is highly reliable. Data for the study were collected through the help of six briefed field assistants. The research assistants were briefed on how to relate and administer the instrument to the respondents. Only fully completed questionnaires were used for the analysis.

Method of Data Analysis

Data collected for this study were analyzed to answer the research questions using frequency table and mean rating while the hypotheses were tested using z-test statistics at 0.05 level of significance.

Data Analysis

Research question 1

Table 1: Mean rating analysis on perception of federal and state lecturers' perception on relevance of effective management and wastage control in public universities.

Item no	Σxs	N	$\overline{X}$	Pm	Σxf	N_2	$\overline{X}$	Pm
1	323	101	3.19		615	210	2.92	
2	284	101	2.81		664	210	3.16	
3	317	101	3.13	3.06	673	210	3.20	3.04
4	292	101	2.89		636	210	3.02	
5	332	101	3.28		613	210	2.91	

Key Decision: The mean of 2.50 and above will be accepted as positive mean while below 2.50 is negative. Table1. shows that the pooled mean of the five questions in the item for state universities is 3.06 which is positive and the federal university with pooled mean of 3.04 which is positive as such their pooled is above 2.50. We therefore conclude that wastage management is relevant in education system for effective productivity in university community.

Research question 2

Table 1: mean rating analysis on wastage of infrastructure and teaching learning outcome in public universities in south-east Nigeria

Item no	Σxs	N	$\overline{X}$	Pm	Σxf	N_2	$\overline{X}$	Pm
1	313	101	3.09		665	210	3.16	
2	332	101	3.28		705	210	3.35	
3	305	101	3.01	3.01	706	210	3.56	3.24
4	295	101	2.92		618	210	2.94	
5	276	101	2.73		713	210	3.39	

Table 2 above indicates that all the questions in the item shows a positive mean. Since the pooled mean of the state and federal respondents are positive, 3.01 and 3.24 respectively, we therefore conclude that wastage of infrastructure in the university community has a negative influence on teaching and learning outcome in the public institutions at study.

Research Question 3

Table 3. Mean rating analysis on wastage of teaching workforce utilization and hindered productivity

Item no	Σxs	N	$\overline{X}$	Pm	Σxf	N_2	$\overline{X}$	Pm
1	301	101	2.98		583	210	2.77	
2	251	101	2.48		397	210	1.87	
3	344	101	3.40	2.77	633	210	3.01	2.5
4	242	101	2.39		408	210	1.94	
5	263	101	2.60		577	210	2.74	

Table 3 shows that question 2 and 4 in the item for state university respondents indicates a negative mean of 2.48 and 2.39 while federal university responses indicated negative mean of 1.87 and 1.94 in the question 2 and 4. Since the pooled mean of the two environments is positive (2.77 and 2.5 respectively), we therefore conclude that wastage in terms of poor utilization of teaching workforce in the public universities hinders effective productivity in education system.

Research Question 4

Table 4: Mean rating analysis on extent of students' dropout and hindered manpower productivity in public universities in south-east Nigeria

Item no	Σxs	N	$\overline{X}$	Pm	Σxf	N_2	$\overline{X}$	Pm
1	330	101	3.26		958	210	4.56	
2	331	101	3.77		661	210	3.14	
3	294	101	2.91	3.26	690	210	3.28	3.38
4	301	101	2.98		623	210	2.96	
5	345	101	3.38		622	210	2.96	

Table 4 above revealed a positive pooled mean of 3.26 and 3.38 for state and federal universities respectively. We therefore conclude base on the finding that wastage in terms of students' dropout from the university hinders quality manpower production in education system.

Table 5: Hypothesis 1: z-test analysis of no significant difference on state and federal lecturers' perception on the relevance of effective management and wastage control in public universities

Respondent	N	$\overline{X}$	SD	Std.err.	Z-cal	Z-crit.	decision
State	101	15.3	1.3930	0.1694	0.5312	1.96	Accepts
Federal	210	15.21	1.4127				Ho_1

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Table 5 shows that the z-cal. of 0.1694≤ z-crit. of 1.96, we there accepts the null hypothesis and reject the alternative hypothesis thus conclude that there is no significant difference between the perception of state and federal lecturers' on relevance of effective management and wastage control in public universities in south-east Nigeria.

Table 6: Hypothesis 2: Z-test analyses on no significant difference on responses of state and federal lecturers on influence of infrastructural wastage and teaching learning outcome

Respondent	N	$\overline{X}$	SD	Std.err.	Z-cal	Z-crit.	decision
State	101	15.03	1.4341	0.1667	7.0185	1.96	Accepts
Federal	210	16.2	1.5540				Ho_1

Table 4.8 reveals that the z-cal of 7.0185≥ the z-critical of 1.96, we therefore accept the alternative hypothesis and reject the null hypothesis thus conclude that there is a significant difference on response of state and federal lecturers' on influence wastage of infrastructure on teaching and learning outcome .

Table 7: Hypothesis 3: Z-test analyses on no significant difference on responses of state and federal lecturers' on wastage of teaching workforce and hindered productivity in education system.

Respondent	N	$\overline{X}$	SD	Std.err.	Z-cal	Z-crit.	decision
State	101	16.3	1.5699	0.2049	-0.4880	1.96	Accepts
Federal	210	16.4	1.9226				Ho_1

The result of the analysis shows that z-cal of -0.4880≤ the z-crit. of 1.96; we therefore accept the null hypothesis and reject the alternative hypothesis thus conclude that there is no significant difference of state and federal lecturers' responses on wastage of teaching workforce and hindered quality manpower production in the university community.

Summary of the Findings

The findings of the study are as follows:

i. Effective management is relevant for judicious utilization of education resources to avoid wastage.

ii. The findings also revealed that wastage in terms of infrastructure such as dilapidated lecture halls, uncompleted and abandoned buildings in the university community influences negatively on teaching and learning outcome. This was evidenced in the pooled mean of 3.01 and 3.24 of state and federal respondents respectively.

iii. It also finds out that poor utilization of education workforce in the university in form of poor remuneration, lack of professional development fund, inability to recruit more competent workforce hinders quality productivity in the education sector.