COST DRIVERS IN DISTANCE EDUCATION: The Values in Nigerian Universities

Inegbedion, JULIET O.
National Open University of Nigeria, NIGERIA

Adeyemi JULIUS K.
University of Benin, Benin-City, NIGERIA

ABSTRACT

Distance university education has come a long way in Nigeria. It started as a dual mode and today has both the dual and single modes. However, the system has been faced majorly with the challenge of inadequate funding. This has hampered the success rate of the system. Therefore for the purpose of appropriate utilisation of the available fund, it is necessary that the knowledge of the unit cost of cost drivers is gained. This will help in re-directing and prioritising the available fund. To meet this purpose, five research questions were raised and answered. Descriptive survey research design was used. Checklist served as the instrument used to obtained data from the sampled institutions. The data collected were analysed using econometric formulas and charts.

The findings revealed that cost drivers in Nigerian distance education programmes have not attained adequate unit costs. High enrolment and proper planning before commencement of programmes were recommended.

Keywords: Unit cost, enrolment, expenditure and annual fixed cost

INTRODUCTION

The Federal Government of Nigeria has embraced distance university education programmes as one of the ways of improving access to university education. However, it is faced with several managerial difficulties that limit the achievement of its objectives including cost considerations. The purpose of this study is to determine the unit cost of the various cost drivers and analyse the factors that determine the cost functions in distance education programmes. To guide this study, five research questions were raised and answered. These are: What is the unit cost of student administrative support services in distance education programmes in Nigerian universities? What is the unit cost of course material production in distance education programmes in Nigerian universities? What is the unit cost of e-learning development in distance education programmes in Nigerian universities? What is the unit cost of presentation in distance education programmes in Nigerian universities? Which of the cost drivers has the highest unit cost in distance education programmes in Nigerian universities?

The scope of the study covers the institutional expenditure on the various cost drivers in distance education. The study is delimited to the single and dual mode distance education universities approved by the National Universities Commission (NUC). The period of study covered 2004/2005 to 2008/2009 academic sessions. The findings of the study will be found useful to distance education planners and managers in improving the existing distance education programmes as well as establishing new programmes.

COST OF STUDENT ADMINISTRATIVE SUPPORT SERVICES

In Distance Education (Full-time/Part-time), administrative fees are charged to underwrite the cost of a wide range of student services. These include technical support for web courses, the handling and distribution of course materials, postage, and other expenses related to the administration of distance education courses (Memorial University, 2010).

The administrative costs related to distance education are: provost, human resources financial management services, contract and compliance office, payroll services, student financial services, extra cost for processing social buildings, extra cost for special processing (student information management system, research office, graduate college) office of Distance Education (Dean's Office, Taylor and Parker III, 2010). The amounts of support an institution can offer largely depend on the institutions capacity and resources at its disposal. However, Molefi, (2002) classified these as academic, including such packages as tutorial, advising and counselling services and administrative functions, such as enrolment, admission and registration, record keeping, information provision, and delivery of study materials

Managing and administering the distance system is cost intensive. Lentell (2004) and Welch and Reed (2005) classified the activities where student administrative cost are incurred as operational issues such as: finance, student recruitment, enquiries processing, enrolment, materials development, materials manufacture, tuition and support, assessment, technology and governance and management structure. An institution should work towards ways of proper management of the variable costs of student administrative support, so as to reduce cost without it affecting its quality. These variable contacts include face-to-face contact, phone contact, email and web self-service. It is only through proper analysis that these variables can be properly managed and still maintains the quality of student support services. Also, it includes the management of the variable cost of academic staff (Taylor, 2007).

From the foregoing presentation, it could be said that the cost of administrative support services includes non-academic staff salaries, cost of land and building of administrative premises, cost of administrative equipment (chairs, tables, computers, peripheral, etc), maintenance and utilities, refurbishment cost of an existing building and insurance of equipment.

COURSE MATERIAL DEVELOPMENT COST

The cost structure of open and distance learning differs from that of conventional education. Considerable fixed costs for the development of study materials are incurred even before any student is enrolled in the course. Therefore careful planning for course materials development is central in the management of distance institutional expenditure and ensuring the cost-effectiveness of the process (WikiEducator, 2010). Course material development cost is a part of the direct cost of ODL. The development cost includes cost of authoring. Like other capital assets, a course material has a particular working or useful life. The material is revised after certain number of years so as to be abreast with the expanding knowledge. Course material development team is a multidisciplinary team, comprising course writer (subject specialist), instructional designer, editor, graphic artist, media producer, reviewer and other relevant personnel. The role of the team is to design interactive and user friendly self-instructional distance learning materials. Cost of course material development is influenced by its development cost – the cost of the pilot phase, this includes the economics of printing and manufacturing cost.

The number of copies produced depends on the type of material and its purpose (Tomlinson, 2010).

The vital issues in print material development include credit unit of the course which determined the amount it would be written, edited and reviewed. Expenses related to high level decision making on print material e.g. the cost of study tour to existing distance universities, cost of consultants to advice and train, and cost of equipment for course material production. Rumble (1988) observed that planners were setting up distance institutions on a limited budget; this gave problem to those managing it, especially in course material development, which affects costs. Based on this, he suggested the use of existing material through adoption or adaptation; videoing lectures from conventional methods and self-develop material.

The use of any of these methods depends on the available finance and the cost of each method. Kember and Dekkers (1987) emphasised that students considered academic support valuable in remediating problems with the study package. The facilities required to offer academic support through study centres are cost intensive. Ukpo (2006) expressed the need to ensure students' satisfaction in ODL by improving on the supply of course materials, tutorial support and students' net-working. Course materials are significant in distance education. Students are at risk of dropping out when course materials are not available (Wood, 1996 in Gahusha, 2010).

Also, some courses may not be viable after sometime if they can no longer attract students. Therefore to project the cost of a course material requires an estimate of its working life. WikiEducator (2010) advised that one should be conservative in the estimation of the working life of a course or programme. For instance even though a course material is to last for seven years, it may be more prudent to base the cost projections on a working life of five years. The institution will benefit from any unexpected income that will accrue if the course material remains viable for the full seven years without revision. The two major approaches used to depreciate or account for the fall in value of course materials over the life of a course are simple depreciation and annualisation (Calculate the annuity). Rumble (1997) recommended that Simple Depreciation method may be used where funds have been set aside for the development of a particular course and cannot be used for any other purpose. On the other hand, annualisation method should be used when comparing the relative costs of two or more alternative uses.

Apart from the capital cost of course material production, the marginal cost is also significant. The marginal cost is additional expenditure incurred to produce one more unit of a product or service (WikiEducator, 2010). WikiEducator (2007) upheld that marginal cost of accommodating up to 5% more students than originally projected could, in fact, be nil if the cost of printing/reproducing the surplus study materials has already been factored into the calculations. The income and expenditure in course material development are very significant (WikiEducator, 2010). Keegan (1990) and Rumble (1997) produced a generic costing template for developing course material. The template recognised the indirect costs (overheads), direct costs, development costs and presentation costs. These costs are to be calculated in the units in the course material, number of units, cost per unit and total costs. The cost generated through this template could be used for projection.

The modern distance programmes tint towards e-learning. Where it cannot be fully integrated, it has to be used as compliment. So there is a shift from print material to e-material.

Rumble (2001) asserted that the institutional costs of a fully developed e-education systems would include developing e-materials, teaching (and assessing) students online, accessing the web site, administering students online, providing the infrastructure and support within which e-edcation can operate and planning and managing e-education at the macro-level. He therefore classified the costs of e-education under costs of developing web-based materials, the costs of delivery e-education and the overhead costs of embarking on e-education.

PRESENTATION COST

Presentation is part of direct cost which include tuition cost, student support services, media cost, facilitators' cost, transportation of course materials to study centres, academic staff salaries and cost of Tutor Marked Assignments (TMAs). Garrison and Baynton (1987) defined Learner Support as the resources learner can access to help them in the learning process. A distance education must develop an effective learner support services in the system. Unfortunately, many distance education system invest more on technical system at the expense of the learner support system. Gunawardena (1996) opined that equipment or more resources should be invested in learner support system for distance education to be successful. Dillion and Blanchard (1991) described four types of learner support services in a distance education system. They are learner support and learner needs, learner support and content, learner related to the institutional context, and learner support and technology.

Garrison (1989:29) observed that distance education support is "concerned with range of human and non-human resources to guide and facilitate the educational transaction". He observed that these resources could be library facilities, different media and software programmes, and socio-economic.

Other services as provided in the guidelines for distance education as provided by various accredited bodies include access to library materials and facilities, delivery of course materials, traditional mail services, counselling, mentoring, job placement and peer interaction (Osun, 2004). Kuroba (2010) prescribed that efficient delivery system should meet prompt supply of materials, despatched in appropriate packaging and methods, appropriate record keeping for materials supplied, safe delivery of materials.

To meet this involved cost hence Distance Learning Guide (2009) opined that the cost of preparing teaching method, teaching in front of a camera or via a computer is incredible. Therefore, there is the need to give a thorough hour analysis so as to be able to have a better organisation of presentation in a distance education.

Taylor (2007) observed that in traditional distance education, "the distribution of packages of self-instructional materials (printed study guides, audiotapes, videotapes, etc) is a variable cost which varies in direct proportion to the number of students enrolled". In presenting the direct costs of presentation, Keegan (1990) opined that ODL costs are of two-way communication to support the learner. Course presentation involves all the cost of the costs of tutoring and student support. The number of students determines the costs of student support. Student supports are variable costs. Typical cost drivers are Tutor Marked Assignments (TMAs), counselling and tutoring. The mode of learning (either individually or group) could also affect costs (http://www.col.org/trainingresources/costingodl/generic.htm)

The indirect costs (overheads) are the costs which do not arise directly from a specific course.These costs include buildings (such as offices), equipment (server, radio transmitters) or services (cost of the director).

The decision of whether these costs should be included when budgeting for a particular course will depend on the purpose of the costing exercise and the nature of the respective cost driver (e.g. a capital or an operating cost). Quality is a key part in presentation. This may be very significant in course material presentation and e-learning. Mader (1998) specified that the cost of quality (CoQ) is generally between 15 – 40% of sales, with marginal gain in efficiency. This implied that the users of the course materials and the e-learning will be motivated to learn with the hope of seeing a good quality of what is packaged.

In deciding what should be cost in ODL, especially presentation cost, Geith and Cometa (1998) used the beta-version of the activity-based cost analysis model developed at Indiana University Purdue University-Indianapolis (IUPUI) for the Teaching Learning and Technology (TLT) Group Flashlight project, for Rochester Institute of Technology's (RIT) as the second user. However, the model was modified to fit its objectives with the activities categorised into six parts-faculty preparation, presentation, interaction, assessment, practice/application and evaluation, tasks were identified in each components to gather direct costs and indirect costs for each activity. This study revealed that organisation and management of distance programmes is better when various tasks are identified and cost as direct costs and indirect costs according to specification of tasks. Cost analysis also helps to gain a clearer understanding on the operating costs and presentation cost. Therefore, to arrive at accurate cost of presentation requires the knowledge of the cost drivers for determining direct and indirect costs in presentation. The amount of cost incurred in presentation depends on the quality of activities involved in the presentation.

METHODOLOGY

A descriptive survey, employing the *ex-post facto* design was used in this study. The population comprised all the universities providing distance programmes in Nigeria. Purposive sampling was used in selecting the two oldest dual mode universities and the only single mode university providing distance education programmes. Checklist served as the instrument. The instrument was divided into five sections. Section A was used to elicit background information, Section B was used to generate student enrolment, Section C covers the cost drivers on student administrative support services, Section D elicited information on course material and e-learning and Section E was used to obtain information on cost of presentation. The drivers in presentation cost included academic staff salaries, facilitators cost, cost of distributing course materials to study centres, examination cost, cost of Tutor Marked Assignments, study centre expenses and others. The instrument was face validated. The instrument was administered to the sampled institutions.

To calculate the unit cost of student administrative support services, the total enrolled number of students presented in section B and the cost of student administrative support services presented in section C were substituted into the Unit cost formula (total expenditure/total enrolment). The result obtained was further presented in a chart.The unit cost of course material production was obtained by summing up the cost presented under print material in section D of the instrument. The total amount obtained was substituted as the total expenditure in the unit cost formula. The total numbers of course materials that have been produced (written + adapted + adopted) were substituted into enrolment in the formula. The unit cost of e-learning development was determined by substituting the total cost incurred for e-learning development in section D of the instrument into the unit econometric formula as the expenditure and the sum total of the enrolment in section B was also substituted into the formula. A chart was used in presenting the results obtained.

ANALYSIS

Research Question 1
What Is the Unit Cost of Student Administrative Support Services in Distance Education Programmes in Nigerian Universities?

Table: 1
Cost of Student Administrative Support Services of Distance Education Programmes in Nigerian Universities

Year	Enrolment	Total Expenditure		Unit Cost	
		₦	$	₦	$
2004/2005	605	685,226,360.56	4,406,600.39	1,132,605.55	7,283.64
2005/2006	18,205	1,821,729,520.18	11,715,302.38	100,067.54	643.52
2006/2007	2,643	1,700,314,679.87	10,934,499.55	643,327.54	4,137.15
2007/2008	23,271	1,897,551,584.03	12,202,904.08	81,541.47	524.38
2008/2009	18,935	2,650,581,977.18	17,045,543.26	139,983.20	900.21
Total	63,659	8,755,404,121.82	56,304,849.66	137,536.00	884.48

Source: Field Study
Note: $1 = ₦155.5 as at 20th February 2012

The unit cost of student administrative support services in Nigerian distance education programmes as presented in Table 1 was ₦137,536.00 ($884.48) with an enrolment of 63,659. Year 2007/2008 had the least unit cost of ₦81,541.47 ($524.38) with an enrolment of 23,271.

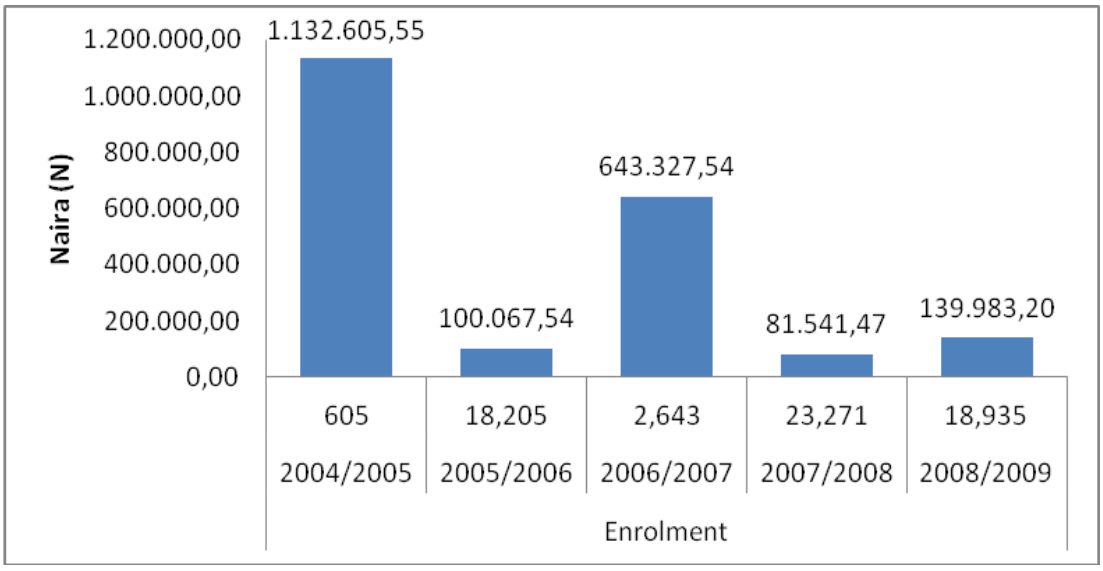


Figure: 1
Unit Cost of Student Administrative Support Services in Nigerian Distance Universities

The unit cost vary according to enrolment and expenditure incurred. This is further presented in Figure: 1.

Research Question 2
What Is the Unit Cost of Course Material Production in Distance Education Programmes in Nigerian Universities?

Table: 2
Unit Cost of Course Material Production of Distance Education Programmes in Nigerian Universities

Year	Expenditure on Course Material		Annual Fixed Cost of Course Material		Total Number of Course Materials	Unit Cost
	₦	$	₦	$		
2004/2005	428,390.00	2,754.92	98,958.09	636.39	827,000	₦824.6 ($5.30)
2005/2006	1,805,009.00	11,607.77	416,957.08	2,681.40		
2006/2007	1,470,810.00	9,458.59	339,757.11	2,184.93		
2007/2008	350,639,855.00	2,254,918.68	80,997,806.50	520,886.22		
2008/2009	327,597,991.00	2,106,739.49	75,675,135.92	486,656.82		
Sub Total	681,942,055.00	4,385,479.45	157,528,614.70	1,013,045.75	827,000	₦824.6 ($5.30)

Source: Field Study

The unit cost of course material production in Nigerian distance education programmes as presented in Table 2 is ₦824.60 ($5.30) with a total expenditure of ₦681,942,055.00 ($4,385,479.45) and 827,000 number of course materials produced between 2004/2005 – 2008/2009. The highest cost of course material production was incurred in 2008/2009. The total annual fixed cost of course material was 157,528,614.70 ($1,013,045.75) during the life span of course material.

Research Question 3
What Is the Unit Cost of E-Learning Development in Distance Education Programmes in Nigerian Universities?

Table: 3
E-Learning Cost of Distance Education Programmes In Nigerian Universities

Year	Expenditure on Course Material		Annual Fixed Cost of Course Material		Total Number of Course Materials	Unit Cost
	₦	$	₦	$		
2004/2005	428,390.00	2,754.92	98,958.09	636.39	827,000	₦824.6 ($5.30)
2005/2006	1,805,009.00	11,607.77	416,957.08	2,681.40		
2006/2007	1,470,810.00	9,458.59	339,757.11	2,184.93		
2007/2008	350,639,855.00	2,254,918.68	80,997,806.50	520,886.22		
2008/2009	327,597,991.00	2,106,739.49	75,675,135.92	486,656.82		
Sub Total	681,942,055.00	4,385,479.45	157,528,614.70	1,013,045.75	827,000	₦824.6 ($5.30)

Source: Field Study

The unit cost of providing e-learning in Nigerian distance education programme was ₦3,989.32 ($25.65) with total cost of ₦253,955,881.00 ($1,633,156.79) and enrolment of 63,659 as presented in Table 3.

This is further presented in Figure: 3.

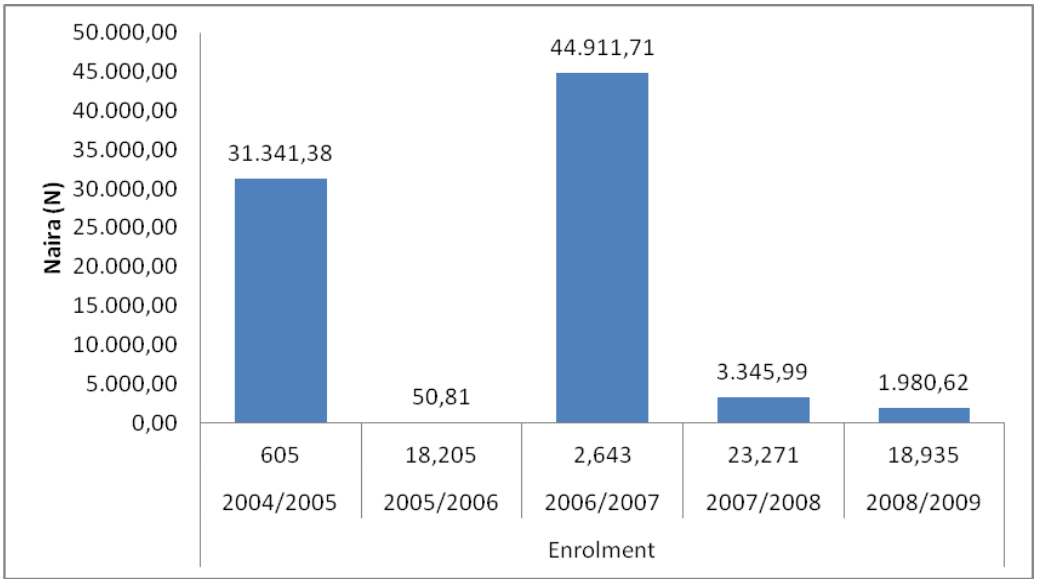


Figure: 3
Unit Cost of e-learning in Nigerian Distance Programmes

Research Question 4
What Is the Unit Cost of Presentation In Distance Education Programmes in Nigerian Universities?

Table: 4
Presentation Cost of Distance Education Programmes In Nigerian Universities

Year	Total Cost of Presentation		Enrolment	Unit Cost	
	₦	$		₦	$
2004/2005	128,154,600.00	824,145.34	605	211,825.79	1,362.22
2005/2006	912,459,393.00	5,867,906.06	18,205	50,121.36	322.32
2006/2007	247,401,387.50	1,591,005.71	2,643	93,606.28	601.97
2007/2008	329,578,774.15	2,119,477.65	23,271	14,162.64	91.08
2008/2009	343,266,041.60	2,207,498.66	18,935	18,128.65	116.58
Sub Total	1,960,860,196.25	12,610,033.42	63,659	30,802.56	198.09

Source: Field Study

The unit cost of presentation in Nigerian distance education programmes as highlighted in Table 4 showed ₦30,802.56 ($198.09) with the total cost of presentation as 1,960,860,196.25 ($12,610,033.42) and enrolment of 63,659.

The least unit cost of ₦14,162.64 ($91.08) was recorded in 2007/2008.

This year had the highest enrolment of 23,271. This is further presented in Figure 4.

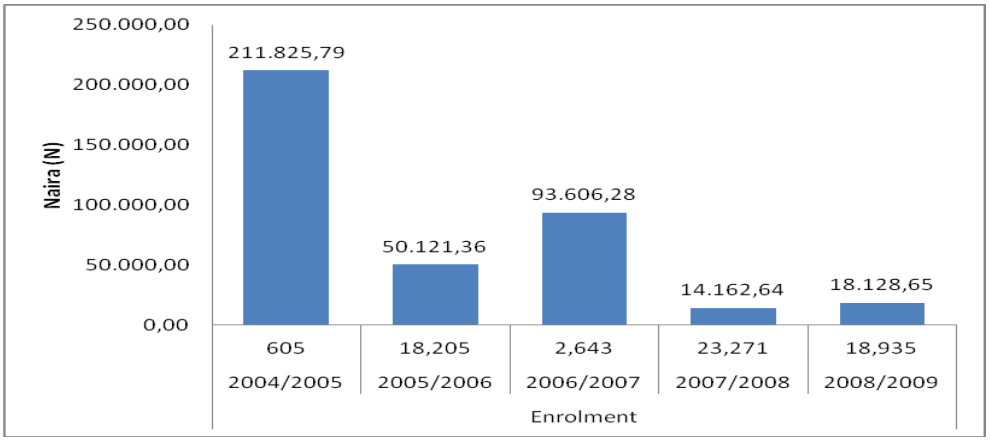


Figure 4
Unit Cost of Presentation in Distance Education Programme in Nigerian Universities

Research Question: 5
Which of the Cost Drivers Has the Highest Unit Cost In Distance Education Programmes in Nigerian Universities?

Table: 5
Cost Drivers Unit Cost

Cost Drivers	Unit Cost	
	₦	$
Student Administrative Support Services	137,536.00	884.48
Course Material Development	824.6	5.30
E-Learning	3,989.32	25.65
Presentation	30,802.56	198.09

Source: Field Study

From the data in Table 5, student administrative support services recorded the highest unit cost of ₦137,536.00 ($884.48), while course material development recorded the least unit cost of ₦824.60 ($5.30). This is further presented in Figure: 5.

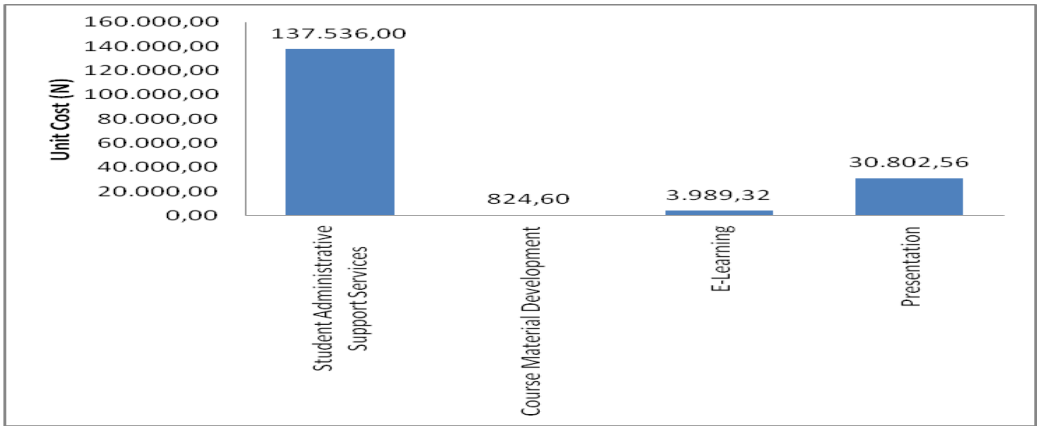


Figure: 5
Cost Drivers Comparison

Furthermore Figure 6 is presented to ascertain the interactivity and the movement of the cost drivers along the line.

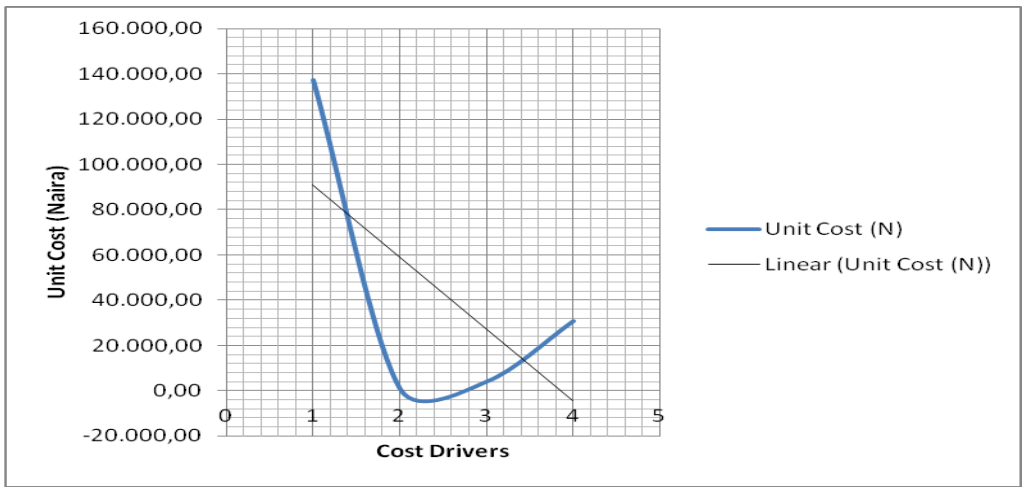


Figure: 6
Effect of Enrolment on Unit Cost of Cost Drivers in Distance Education Programmes in Nigeria

As shown in Figure: 6, The shift in the unit cost of the cost drivers is dependent on the number of student enrolment, hence the linear movement, which explain the effect of enrolment on the unit cost of cost drivers. The graph equally shows that the unit costs do have perfect fit. The points of the unit costs are far from the line. This implies that the cost drivers have not attained a perfect unit cost.

DISCUSSION

The major cost drivers as identified in the study were student administrative support services, course material development, e-learning and presentation. This corroborates Rumble (2001), who used these drivers in economics of distance education. From the findings, student administrative support services recorded the highest unit cost, while course material development recorded the least unit cost. The cost of student administrative support services is usually influenced by direct and overhead costs of the institution, such as course material distribution, phone calls, land, building, equipment, and academic ceremonies. From the study, the high expenditure on student administrative support services may have arisen due to initial investment required before students are enrolled. This is more pronounced where the system is not yet stable. Hence, Rumble (1982) opined that initial investment in administrative system prior to the enrolment of any student is likely to be significant in distance learning.

The study highlighted course material development and e-learning as the major fixed and direct cost in distance education programmes. WikiEducator (2010) also observed that course material development is one of the direct cost in ODL cost. A low investment on course material production and e-learning usually could have advert effect on the success of distance education programmes. This was revealed in Figure 6, because the unit costs did not attain a perfect fit. When the unit cost of a programme is not adequate it invariably affect the programme negatively. Furthermore, the least unit cost recorded on course materials implied that print materials are the cheapest to develop as compared with e-learning. This supported the claim of Hülsman (2000) that print is the cheapest to develop.

This might have been the reason why the institutions providing distance education programmes in Nigeria gave more attention to print.

It could be said that investment into the course drivers should be made according to order of importance in the system so as to be able to achieve the desired goal in distance programmes.

The major problem associated with the development of e-learning based materials or tutorial is huge sum of money required for the equipment and hiring of expertise for development and operations. This corroborates the work of Rosenberg (2001) who observed that information and Communication Technology (ICT) media for education like film, radio, television, audio-videotapes which was scored to have great promise for education had not been fully integrated into the educational system because of the high development costs. Investment in ICT was seen as a solution to the increasing demand for education (Alexander, 2001).

In addition, Pailing (2002) opined that the corporate world investment on ICT was encouraged by the expectation that learning organisations would become more flexible and competitive. Taylor (2007) observed that in traditional distance education, the distribution of packages of self-instructional materials (printed study guides, audiotapes, videotapes, etc) is a variable cost, which varies in direct proportion to the number of students enrolled. Distance Learning Guide (2009) opined that the cost of preparing teaching method, teaching in front of a camera or via a computer is incredible. But the study of Eicher, Jamison, Klees, McAnacy, Mayo, Orivel, Perraton and Suppes (1977, 1980, & 1982) suggested the consideration of economic benefit in determining the cost of e-learning. In which case, where e-learning is found to be so expensive beyond what the institution can cope with, the alternative media could be used.

CONCLUSION AND RECOMMENDATIONS

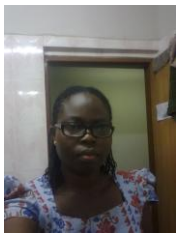
In conclusion, it could be said that the cost drivers in Nigerian distance education programmes have not attained adequate unit costs. This therefore may have hampered the success rate. Based on the findings, the following are recommended.

- **Academic programmes should not commence until the major cost drivers such as the development of course materials are at least one third ready. This means the course materials to be used in two academic sessions in a programme should have been made ready before commencing that programme. While the remaining sessions course materials is completed before the end of the first two academic sessions. By so doing there will be no distorted academic calendar and enrolments, and this would lead to a reduction in cost of wastage arising from non-enrolment of students in academic calendar. This would further lead to a lower unit cost per course material.**
- **The fund required for the running of student administrative support services is quite high. This high cost leads to high unit cost. To achieve a lower unit cost, the policy makers and ODL managers should examine the kind of buildings, equipment and determine a ceiling for employment. To avoid wastages, it should be ensured that every person employed has enough work to do that will justify the pay. It should be ensured that equipment and facilities are supplied according to specifications.**
- **High student enrolment should be encouraged, though with a ceiling. This will lead to a reduction in the unit cost.**

IMPLICATION FOR EDUCATIONAL PLANNING

The unit cost on course material would help in determining the total amount that would be required to complete the course production of materials yet to be written. It would also guide the decision on the total amount required for course review. On the whole, the findings would guide ODL quality assurance agencies in setting up quality guidelines on distance education programmes.
Such guidelines on minimum and maximum enrolment required to run a programme, cost drivers to look out for and their specific level of performance that must be attained in the institution, area of control measures an institution must set up to reduce wastages and student attrition.

BIODATA and CONTACT ADDRESSES of the AUTHORS



Inegbedion, JULIET OBHAJAJIE holds a Ph.D in Educational Planning. She is a course coordinator 1 (Lecturer I) for business education in the School of Education, National Open University of Nigeria. She specialises in Business Education, Educational Planning and Economics of Education.
Inegbedion, JULIET O.
National Open University of Nigeria, NIGERIA
Email: julietinegbedion@gmail.com

ADEYEMI, JULIUS K is a professor of Educational Planning and Economics of Education. He is in the Department of Educational Studies and Management, Faculty of Education, University of Benin, Benin City, Nigeria.
Adeyemi JULIUS K.
University of Benin, Benin-City, NIGERIA
Email: Jka9011@yahoo.com

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