

**E-Learning platform system for the department of  
library and information science, Modibbo Adama  
University of Technology, Yola : A Developmental plan**

**Information Impact:**

Journal of Information and  
Knowledge Management  
2016, Vol. 7 (1) 51 – 69  
ISSN: 2141 – 4297 (print)  
ISSN: 2360 – 994X (e-version)

**Dauda Joshua**

*University of Western Cape, South Africa*

**Kate Obille**

*University of the Philippines, Dilman, Quezon City*

**Elijah John**

*University of the Philippines, Dilman, Quezon City*

**Umar Shuaibu**

*Gombe State University, Nigeria*

**Abstract**

The application of e-learning is accentuated amongst higher institutions of learning globally. Due to the increase in enrolment and the daunting task of teaching large classes, there arises the need to adopt e-learning platform to reduce the burden between the teacher and student collaborations. This paper seeks the establishment of a dedicated e-learning platform in the department of library and information science (DLIS) as a prototype for the entire Modibbo Adama University of Technology (MAUTECH), Yola to adopt. Based on this, a five-year developmental plan (2016-2021) is designed for DLIS to ensure the establishment of an e-learning platform with budgetary allocation included. This article will benefit lecturers and students of MAUTECH, Yola in strengthening their ICT appreciation and application in the university. It will also enhance onsite and offsite collaborations between lecturers and students of the university. The outcome of this paper, if the platform is adopted, should reduce the decongestion of over 300 to 500 students in lecture halls immensely. It will encourage distance learning opportunities for working class students who might not be available to attend the traditional classes and it will stimulate virtual classes thereby encouraging an increase use of ICT tools.

**Keywords:** E-learning, Platform, Information and Communication Technology (ICT),  
Virtual, System, MAUTECH,

**Introduction**

The 21<sup>st</sup> century learning environment is becoming more virtual and dynamic in

nature. Many students and lecturers are exposed to social media on a daily basis and virtual learning is making its way to

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the summit for our contemporary learning practice. Pappas (2015), in his investigation revealed that 63% of learning management system users is very satisfied with the application and e-learning had positive impact on them. Docebo (2014:12) stressed that the development of the e-learning market in Africa is still restricted by inadequate ICT infrastructure and connectivity issues, but affirmed that mobile devices have strong trend in the support of e-learning in Africa. Chadwick (2014) explained e-learning trends in 2014, ranging from an increased interactivity, more learning for everyone, online classes, increased use of social media, the emergence of Massive Open Online Courses (MOOCs) as a venue for learning, effective learning content through the shift to mobile technologies, and the paradigm shift from textbooks to tablets. This development is an indicator of the improved learning environments one can experience via ICTs as compared to the traditional learning methodology. Nuland

and Rogers (2014) stressed that e-learning tools are gaining popularity as a means of instruction in education and more research are on-going seeking to explore the impact of these tools on learner. This shows the timeliness of e-learning as a tool needed by all a sundry to aid learning and collaboration.

Evans and Le Roux (2015: 26) in citing E-learning Africa (2012) revealed that 42% of respondents attest to the use of ICT enhanced devices for teaching and learning. The report showed that 83% of the respondents used laptops, and 71% used mobile phones which are ranked the most popular learning devices as compared to smart boards, virtual desktops and tablets. Joshua (2012: 70) explained that e-learning aids in hastening the processing of information and facilitates teaching and learning. It provides immediate feedback between students and learning facilitators and does not necessitate physical contact between students and lecturers. Mgquba and Underwood (2015: 39) asserts that

“technology enhanced learning (e-learning) has become one of the dominant modes of teaching and learning in higher education today”. This outcome has made Monash University Library (MUL) to rise to the challenge by making e-learning one of its strategic priorities in support of research, teaching and learning.

### **Overview of e-learning**

Although many literatures cast doubt on the origins of e-learning, some researchers purported the antecedent of e-learning to emerge as far as the 1980's (Moore, Deane & Galyen 2011: 130). Leerbeleving (2015) opined that e-learning started around October 1999 at CBT Systems seminar in Los Angeles. It was at that seminar that the word “e-learning” was used for the first time. This is interchangeably used as “online learning” or “virtual learning”. Supporting this assertion by Leerbeleving, TalentLMS (2015) explained that e-learning existed since 1999 when CBT Systems seminar used the word for the first time. Although he argued that the

principle behind e-learning had been there since 19th century.

Garrison (2011: 2) defined e-learning as “electronically-mediated asynchronous and synchronous communication for the purpose of constructing and confirming knowledge.” This concept is driven by a blended learning and Internet using ICTs. Harandi (2015: 426) referred e-learning “to different learning settings... to allude to almost any learning environment in which electronic media, like computers, are utilized as a piece of an educational delivery system.” This encourages electronic media to enhance information dissemination from a source to its destination. Phelan (2015: 1) defined e-learning as “the use of electronic media and information and communication technologies, and includes various forms of educational technology in learning and teaching via Web-based learning.” These forms of educational technology are limitless to break physical boundaries as they are tools used to support learning

either offline or online. Venkataraman and Sivakumar (2015: 1742) defined e-learning as “a tool used to transfer the delivery, teaching or programs by means of electronic devices like computer, mobile phone, Ipads, tablets etc.” Here e-learning involves imparting content through teaching and the transfer of software through electronic devices. It sets forth the integral role of software and online connectivity in the learning process. On the whole, e-learning can be defined as the adaptation and application of ICTs and related tools to enhance and extend learning environment beyond the four walls of classroom setting via the use of locally-based Intranet and Internet applications.

Joshua (2012: 7) enumerated some of the benefits of e-learning as do-it-yourself approach, increased experience, easy conversion, sharing process, re-use features, previews, find out features, choice and smooth learning processes. Boggs (2015) categorise the benefits of e-

learning from strategic, tactical, training delivery and infrastructure advantages.

Burgess (2015: 137) expressed the advantages of using e-learning in two ways that it provides an improved ability to use and apply technology and learning how technology outside the classroom setting can provide experience inside the classroom more productive. Burgess posits that the use of online discussion boards can prepare students for class to assist them reflect on reading to getting ready for group discussions. Webanywhere (2013) enlisted five top merits of using e-learning thus, convenience, time efficiency, accessibility, dynamic interaction, and creativity. Darghan, Saeed, and Mcheik (2012: 343) described advantages of e-learning ranging from anywhere, anytime, any pace, and online feedbacks. Leonard (2013: 237) enumerated e-learning advantages ranging from learning at any place where an Internet connection is available, flexibility and studying at one’s pace.

There can never be any system or platform without weaknesses. Armstrong (2013) reflected that e-learning does not offer human interaction; it can't cope with thousands of students trying to join a discussion. More so, it is very difficult or impracticable with disciplines that require practice. Njobvu (2015) outlined the disadvantages of e-learning as retrogression for low motivational learners. Students can easily get confused with course activities, may experience isolation from classmates, and the instructor may not be able to attend to students when needed. There are also technical challenges such as slow Internet connectivity and accessibility, lack of computer skills resulting to difficulty in implementing and doing hands on or lab as opined by Armstrong.

Georgevich (2012) mentioned five disadvantages of e-learning: that credits transfer is not allowed since quality of education matters here; learning is not maximized with e-learning; lack of social

interactions; and finally, e-learning does not offer opportunities for fun physical, non-virtual activities like sports and other recreational activities on campus.

### **Background information on department of library and information science**

#### **MAUTECH**

Created over eight years ago, the Department of Library and Information Science (DLIS) of the Modibbo Adama University of Technology (MAUTECH) is under the School of Management and Information Technology (SMIT). It has professional programmes designed to train potential librarians and information scientists to work on all types of libraries and information centres in the country. The Bachelor of Technology degree programme has two components: professional courses to be offered by the DLIS and some elective courses from other departments of the university. More so, the programme avails the students' industrial work experience scheme before their graduation, to enable them to put into

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practice the theories learned in the class setting.

The course duration is five years for those who are starting at the 100 level through the University Matriculation Exam (UME) or four years for Direct Entry (DE) students. At the moment the student number has rising to about 1 000 with only seven lecturers. This calls for an e-learning platform to ease the congestion in the class room setting and enhance better learning opportunities.

This study therefore seeks the establishment of a dedicated e-learning platform in MAUTECH, Yola DLIS. It is aimed at creating more awareness towards e-learning possibility and feasibility project. Suffice it to say that developing an e-learning plan for MAUTECH will certainly enhance the institution's capabilities of offering virtual learning; improve its online presence and increase effectiveness in delivering information to its learners.

**TABLE 1: Developmental plan for DLIS MAUTECH for the establishment of an e-learning platform system 2016-2021**

YEAR	PLAN CRITERIA	STRATEGIES/ACTIVITIES	REMARK(S)
Year 1	PRESENTATION. To create and advance the vision of the system and services across faculties and departments to support e-learning.	1. Generate awareness of uses/functions/tools/ etc. of e-learning:  E-learning uses benefits and functions: a. Student-centred learning b. Enabling group/team work c. Choice and smooth learning processes d. Find out features e. Previews f. Re-use features g. Sharing process h. Easy conversion i. Increased experience j. Do-it-yourself approach etc.  Technologies and e-learning platforms: a. Computers and laptops; b. Internet connection (LAN and	To setup committee(s) in conjunction with the University ICT Committee.

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YEAR	PLAN CRITERIA	STRATEGIES/ACTIVITIES	REMARK(S)
		<p>wireless);</p> <ul style="list-style-type: none"> <li>c. Digital cameras and videos and microphones;</li> <li>d. Open source software e.g. Edu2.0, Moodle, edX;</li> <li>e. Proprietary software e.g. Blackboard, Adobe Connect8, WizIQ;</li> <li>f. Customized platform: e-learning portal site;</li> <li>g. Offline resources: production of CDs, DVDs, videos etc.</li> </ul> <p>E-learning tools: Wikis, Google Forms (for polling), Skype, Yahoo! Messenger, Google Groups, Yahoo! Groups, Internet telephony, emails, Virtual Learning Environment (VLE), etc.</p> <ul style="list-style-type: none"> <li>2. Restructure and reorganize internal resources so as to build a cohesive e-learning platform. <ul style="list-style-type: none"> <li>a. To create a Departmental E-Learning Committee;</li> <li>b. To form sub-committees: <ul style="list-style-type: none"> <li>i. Policy Sub-committee</li> <li>ii. Finance/Procurement Sub-committee</li> </ul> </li> <li>c. Ensure a suitable e-learning site studio/platform near the DLIS laboratory and announce the need for an e-learning platform at: <ul style="list-style-type: none"> <li>i. Departmental meetings</li> <li>ii. Students union meetings</li> <li>iii. MAUTECH website</li> </ul> </li> </ul> </li> <li>3. Coordinate support from within the DLIS to enable centralized e-learning base. The HOD and the Departmental E-Learning Committee shall ensure this is executed. Internal support is already assured from the research survey especially from the faculty members and the students.</li> <li>4. The departmental e-learning</li> </ul>	

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<b>YEAR</b>	<b>PLAN CRITERIA</b>	<b>STRATEGIES/ACTIVITIES</b>	<b>REMARK(S)</b>
		committee shall clearly look at the projected courses, targeted community, the hardware and software components, IT staff, policies, mission, goals and objectives that should generally guide the e-learning activities of MAUTECH DLIS.	
	Laboratory	Inventory of current laboratory facilities and equipment to determine what may be used for e-learning, i.e. the facilities and equipment are still needed both by faculty and students, and which equipment/facilities need upgrading.	HOD in conjunction with the E-learning departmental committee
	E-learning Studio	Determine the best location for the e-learning studio in cooperation with the Director, Physical Planning Unit Office.	E-learning departmental committee
	Hardware Components (Computers, etc.)	<ol style="list-style-type: none"> <li>1. Acquisition of desktop computers, printers and other computer facilities for faculty and students. Estimated cost: N5.31m (See details for Hardware/Accessories and Others) under costing;</li> <li>2. Desktops with flat screens;</li> <li>3. Laptops or PDAs for faculty.</li> </ol>	Departmental E-learning Committee
	Internet Connection	<ol style="list-style-type: none"> <li>1. Will be connected to the University Internet IP</li> <li>2. Procure its departmental Internet VSAT (Very Small Aperture Terminal)</li> </ol>	Departmental E-learning Committee
	Networking the Laboratory and the E-Learning Studio	<ol style="list-style-type: none"> <li>1. Cables (coaxial and copper etc.)</li> <li>2. Ethernet hub routers (DUAL WAN) at least four (4) sets (DLIS laboratory, E-learning studio, Department office, and around the classrooms area)</li> </ol>	To boost network connectivity on-the-site (On Campus)
	Course Content (Development for offline e-learning)	<p>Develop (at least for the major LIS subjects) courses for e-learning in an offline mode of delivery</p> <ol style="list-style-type: none"> <li>a. Create a committee of faculty members for this activity</li> </ol>	Departmental E-learning Committee



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<b>YEAR</b>	<b>PLAN CRITERIA</b>	<b>STRATEGIES/ACTIVITIES</b>	<b>REMARK(S)</b>
		<ul style="list-style-type: none"> <li>b. Purchase the necessary materials (i.e. CDs, or DVDs, video cameras, etc.)</li> </ul>	
	<b>TRAINING.</b> <i>Demo mode:</i> Phase I: Faculty Training Phase II: Students Training	<ol style="list-style-type: none"> <li>1. At least six (6) months of intensive training on how to use the dedicated platform specifically designated for on-site and off-site learning.</li> <li>2. General student trainings would be held to orient the students on how to use the platform system at a duration of three (3) months.</li> </ol>	Finance sub-committee
Year 2	<b>FINANCE.</b> Funding and investments to support the implementation of e-learning platform	<ol style="list-style-type: none"> <li>1. Determine possible sources of funding for the e-learning platform. The funding shall be directed to include: staff training, e-learning equipment and tools, building structure etc. as envisaged at the year one.               <ul style="list-style-type: none"> <li>a. Initiate talks with the government and non-governmental organizations (NGOs) to present plans for establishing an e-learning platform for MAUTECH</li> <li>b. Initiate small-scale fund raising programs for the benefit of the project.</li> <li>c. Scout funding from external sources to assist the laudable project.</li> <li>d. MAUTECH DLIS, through the advisory committee, may look into various sources of funding for the project. This may be executed through launching events, NGOs, internal generated funds, alumni and school community support, etc.</li> </ul> </li> </ol> <p>The aim is to encourage support for the development and delivery of top quality e-learning environment. The main objective should not be towards profit making venture but rather offering easy opportunities to learning, regardless of physical contact.</p> <ol style="list-style-type: none"> <li>2. Once the donors are made aware of</li> </ol>	Finance Sub-committee

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		<p>the benefits of e-learning program being implemented to provide MAUTECH DLIS, a competitive edge by meeting the diverse needs of its student body, support will smoothly be envisaged.</p> <p>This level, being sensitive, has to be given enough time so as to raise capital which will bring the full implementation process of e-learning in MAUTECH DLIS.</p>	
	Proposed estimated cost for the Dedicated E-learning platform	At least N5 to N10 million naira is earmarked for this project. Funding from the budget of MAUTECH DLIS and other sources, from government, banks, NGOs, etc.	Departmental E-learning Committee/Finance subcommittee
	Initiate talks with various sectors to be involved in the funding and/or development of the e-learning platform	<p>Sectors to approach:</p> <ol style="list-style-type: none"> <li>1. University Council and Management</li> <li>2. DLIS yearly allocation</li> <li>3. Federal and State Governments</li> <li>4. NGOs</li> <li>5. Banks</li> <li>6. Philanthropic individuals</li> <li>7. Donations and gifts, etc.</li> </ol>	Departmental E-learning Committee/Finance subcommittee
	Periodic Seminars/Conferences	As a matter of policy and as a way to sustain the use of the platform system, faculty members would be sent to attend conferences and seminars in e-learning generally.	Allocation from Conference vote at the discretion of the HOD
	<p>STAFFING:</p> <p>2 Content Web developers</p> <p>2 IT Attendants</p> <p>1 Manager</p>	<ol style="list-style-type: none"> <li>1. The Manager shall head the team in both the E-learning Studio and DLIS Laboratory. The Manager should have at least a Master's degree in ICT, Computer Science, Operations Research or any related field with some years of experience.</li> <li>2. The Content Developers shall manage the daily coding and encryption of the platform system. They should have at least minimum of a first degree in ICT, Computer Science or any related field.</li> <li>3. The IT Attendants who should have at least a minimum of diploma certificate shall be in charge of the daily routines of both the DLIS</li> </ol>	HOD in consultation with the Departmental E-learning Committee and the University ICT Committee.

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<b>YEAR</b>	<b>PLAN CRITERIA</b>	<b>STRATEGIES/ACTIVITIES</b>	<b>REMARK(S)</b>
		Laboratory and E-Learning Studio and shall be answerable to the Content Web Developers and the Manager.	
Year 3	<b>POLICY FORMULATION.</b> Formulation of policy statements and procedures conducive to offering e-learning.	<ol style="list-style-type: none"> <li>1. This is an annex of the plan for year one, but more intensive in nature.</li> <li>2. A complete user's survey to determine satisfaction, access results, etc., would be carried out.</li> <li>3. Development/formulation of MAUTECH DLIS policies and procedures on e-learning               <ol style="list-style-type: none"> <li>a. Policies have to be conducive to enable e-learning opportunities to students on campus and off campus. There should be policies and procedures conducive to supporting and delivering e-learning platform successfully.</li> <li>b. There should be clear and consistent policies related to e-learning in the area of intellectual property ownership, faculty workload, class size, tuition, undergraduate and graduate admission requirements, course approval processes, admissions, registrations etc.</li> <li>c. Students on site or offsite should be assured of quality online course components and courses through the use of rich multimedia, and communication tools via the proposed dedicated e-learning platform.</li> </ol> </li> </ol>	A Committee for Policy Formulation is needed and to work hand in hand with the Finance sub-committee and the Departmental E-learning Committee.
	Policy documentation	<ol style="list-style-type: none"> <li>1. After the policies have been drawn a draft copy will be sent to the HOD from the Departmental E-learning Committee.</li> <li>2. After approval, the policies will be put in booklet form for circulation for students to use. Students would be guided by the rules and regulations therein.</li> </ol>	Committee for policy implementation.

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<b>YEAR</b>	<b>PLAN CRITERIA</b>	<b>STRATEGIES/ACTIVITIES</b>	<b>REMARK(S)</b>
Year 4	COURSE AND TECHNOLOGY DEVELOPMENT. Technology infrastructure to support an e-learning environment	<ol style="list-style-type: none"> <li>1. MAUTECH DLIS shall provide functional requirements of an e-learning operation which necessitate the multiple technology and skilled support personnel to run them. For example, the course management system, streaming video infrastructure and a content management repository has to be provided. What this means is that MAUTECH DLIS would provide the academic and research community with enhanced technology infrastructure to support easy access to use web-enabled e-learning tools and services.</li> <li>2. This would be the implementation stage to support the e-learning initiatives either on a scheduled delivery (synchronous) or on delivery platforms (asynchronous). Though, most respondents needed the later platform for it would be easier and more comfortable to them. All the technology tools needed for the smooth services should be provided as outlined in year one and even the ones that might not have been mentioned due to oversight.</li> </ol>	Provision of modern technology and infrastructure via the Departmental E-learning committee
	Availability of all technologies/tools	All the technological devices mentioned in year one shall be made available and test run to ensure its efficient operations in the end.	Departmental E-learning Committee
Year 5	TESTING. Student access to e-learning resources and support	<ol style="list-style-type: none"> <li>1. A successful e-learning program has to have easy and accessible services to its patrons.</li> <li>2. Students are to be given complete support services that might be on real time basis (anywhere, anytime). The researcher is not sure of the level of MAUTECH DLIS collaborations with other LIS schools around the world, but this stage is meant to provide and coordinate student access to e-learning and other institutional</li> </ol>	Access to the dedicated e-learning platform system across the globe

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		<p>knowledge resources with other LIS schools.</p> <p>3. A critical stage to take off would ensure testing of the e-learning components in given access to students' services and resources regardless of whether they come to campus or access at a distance.</p> <p>4. The platform system would be tested generally to ensure it workability.</p> <p>5. Also, more e-tools would be used from the faculty to the students.</p> <p>6. E-teaching would be supported here.</p> <p>7. Prospective Online Distance Learning schedules may begin at this stage.</p> <p>8. The E-learning studio would be readily equipped and function to take off.</p> <p>9. The DLIS can link up with other LIS e-learning platforms to collaborate and share resources</p>	

*Note:* Patterned after the University of Zululand, South Africa on "E-Learning Implementation Strategy and Plan" and "A Proposed Information Systems Strategic Plan of UP SLIS (2008-2013)" by Simbol

(2007) from the School of Library and Information Studies, University of the Philippines Diliman, Quezon City, Philippines.

**Cost implication for the proposed e-learning sytem**

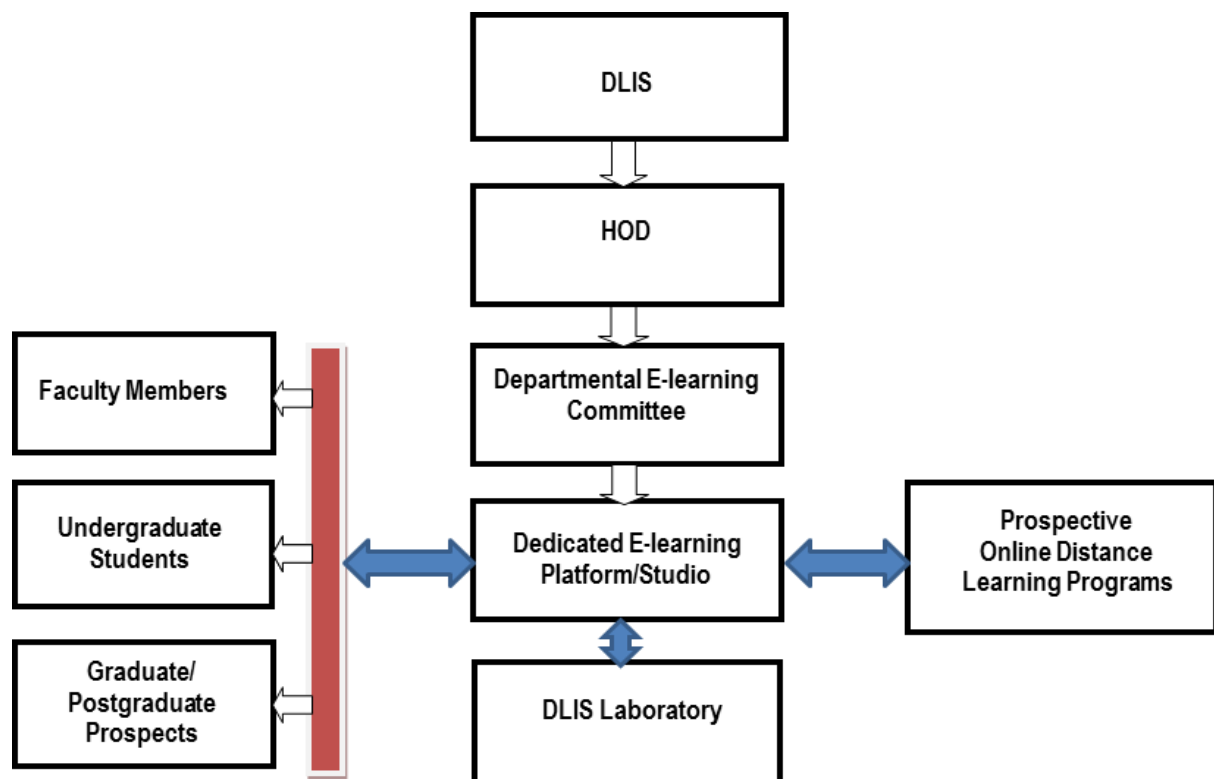
**Costing**

<b>A: PROPOSED TOTAL ESTIMATE FOR THE DEDICATED E-LEARNING PLATFORM SYSTEM IN MAUTECH DLIS</b>	Estimated Amount in Naira
<b>B: HARDWARE/COMPUTERS/ACCESSORIES etc.:</b>	
Desktops with flat screens 50 – 100 sets @ N70,000	700,000
Laptops or PDAs 10 sets @ N100,000	1,000,000
One giant central Lesser jet printer Hewlett Packard @ N100,000	100,000
One big central Matrix printer @ N50,000	50,000
One colour Desk Jet printer (HP) @ N70,000	70,000
Internet VSAT (Very Small Aperture Terminal) @ N1,000,000	1,000,000
One main server @ N500,000	500,000
Two large steel cameras @ N50,000	100,000
LCDs/Projectors: Two large ones @ N30,000	60,000

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100 small UPS @ N30,000	300,000
Two giant UPS @ 100,000	200,000
DVDW, DVDRW Four sets @ N50,000	200,000
Video Camera(s) Two sets @ N200,000	400,000
Microphones, speakers, and others @N300,000	300,000
Cost of cables (coaxial and copper etc.) @ N200,000	200,000
Ethernet hub @ N50,000	50,000
Routers DUAL WAN at least 4 sets @ 20,000	80,000
<b>Sub-total</b>	<b><u>N5, 310,000</u></b>
<b>C: SOFTWARE APPLICATIONS: Operating Systems/ Platform systems etc.</b>	
Windows OS Windows 8/10 @ N100,000	
<b>E-learning platforms:</b>	
Open Source – free	-
Proprietary @ N500,000	500,000
Customized Designed – Departmental portal @N300,000	300,000
Off-line – CDs, DVDs and Videos clips @N50,000	50,000
<b>Sub-total</b>	<b><u>N850,000</u></b>
<b>D: TRAININGS:</b>	
Faculty members - 10 faculty @ N20,000 each	200,000
General training for students 3 months @ N100,000	100,000
<b>Sub-total</b>	<b><u>N300,000</u></b>
<b>E: E-LEARNING STUDIO:</b>	
For the construction @ N1,000,000	1,000000
<b>Sub- total</b>	<b><u>N1,000,000</u></b>
<b>GRAND TOTAL</b>	<b><u>N7,460,000</u></b>

### E-Learning Programme Departmental Flowchart



**Figure 1: MAUTECH, DLIS E-learning flowchart**

### **Conclusion and recommendations**

This article reveals the need for a dedicated e-learning platform with a five year developmental plan from 2016 to 2021 with a budgetary allocation provided. This is designed in order to create vision and services across the university to ensure the formulation of e-learning policies for the development of the DLIS and the entire university. The DLIS is encouraged to liaise with MAUTECH, Yola management to ensure the implementation of the said project. The project if implemented shall internally generate income (fund) to the university. It is hoped that lecturers and students of MAUTECH, Yola shall imbibe and apply any and/or all of the platform systems recommended in enhancing their learning opportunities which should eventually boost their ICT skills to compete with other institutions globally.

This article recommends prompt reaction from MAUTECH, Yola, management in

ensuring adequate funding and support for the implementation and take-off of a dedicated e-learning platform in DLIS. DLIS should not allow the vision, passion or zeal for the project to diminish, but ensure its kick-off.

Lecturers and students should be exposed to trainings and seminars on the application of e-learning on time before the take-off of the project to help them overcome any anxiety or phobia that could arise as a result of the platform system.

The researchers suggest the adoption of the following e-learning systems:

**1. Open source platforms:** (Edx, Moodle, Edu2.0, AMI -An African online learning platform etc.) - DLIS may wish to fully utilize any or all of these free resources.

Though their features are minimal and flexibility not 100% guaranteed, they can provide a good start for the programme.

**2. Proprietary platform:** (Blackboard, WizIQ, Adobe Connet8 etc.) - This is a subscription platform system renewable in

an annual basis. Numerous features are made available here and the sites of the platform systems are to a certain extent more reliable.

**3. Customized platform:** This is where the department can design its own Courseware Management System (CMS) with different modules to enhance its distance learning opportunities, if not now, at least in the near future. The researcher recommends a portal name to be called eDLISMAUTECH. This is to follow the pattern of other LIS schools around the globe that are already embarking on e-learning technologies. A good example is from Nanyang Technological University in Singapore having their e-learning portal located at <https://edventure.sg>, <https://ntulearn.ntu.edu.sg/images/ci/NTUlearn/index.html> and University of the Western Cape <http://www.uwc.ac.za/ELearning/Pages/default.aspx>, and <https://ikamva.uwc.ac.za>

**4. Off-line platform:** An in-house designed e-learning platform. The use of

CDs, DVDs and videos can be utilized by instructors to further extend learning activities beyond the four corners of the classroom setting. There is again the need for studio and equipment setting in this area.

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#### **Author biography**

**Dauda Joshua** is of the Department of Library and Information Science, University of the Western Cape, South Africa. He can be reached @ [jopromy@yahoo.com](mailto:jopromy@yahoo.com)

**Kate Obille** is Professor at the School of Library and Information science at the University of the Philippines, Dilman, Quezon City. She can be contacted @ [kate110277@gmail.com](mailto:kate110277@gmail.com)

**Elijah John** is with the School of Library and Information science at the University of the Philippines, Dilman, Quezon City. He can be contacted @ [efdjarjuan@gmail.com](mailto:efdjarjuan@gmail.com)

**Umar Shuaibu** is Librarian, Gombe State University Library, Nigeria