

# Cloud Based E-Learning Model for Open and Distance Learning in Nigerian Universities

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**Abstract:** *E-Learning is becoming increasingly very important in solving higher educational need. Developed countries have been able to use ICT to establish 'Virtual Universities'. The need for university education in Nigeria has become very glaring and year in year out the number of youth seeking admission into the Universities is increasing while only a very small percentage of those that are qualified are admitted. At present Nigeria has one single mode open University, the National Open University of Nigeria (NOUN) and six dual mode universities (Conventional Universities with distance Learning Centers recognized by National Universities Commission (NUC). Cloud based E-Learning is suitable for delivering sound and flexible education in Nigeria because, deployment of the system can be done very fast with minimum cost; it also lessen the burden of maintenance and support from the university. The Cloud based E-Learning architecture is made up of the following components, the infrastructure layer which is composed of information and infrastructure and teaching resources, Software resource layer which is mainly composed of operating system and middleware, Resource management layer is very important in achieving a loose coupling of software resources and hardware resources.*

**Keywords:** Cloud, E-Learning, Model, Open Learning, Distance Learning

## 1. Introduction

Today we live in a world that is governed by electronic system; our lives will become increasingly more difficult if we are not connected in some way to the internet. The Internet today provides many services among which are Banking, E-commerce, Entertainment, News, Socializing, Shopping, Communicating, educational resources, studying and many more services. While most of these services have fully been exploited by Nigerians, E-Learning has not been given the attention it requires.

E – Learning is as teaching and learning environment constructed in software, which supports collaborative learning among students who participate at times and places of their choosing, through computer networks. E - Learning is widely used in most of the developed countries to promote distance education (DE) and lifelong learning. It can also be defined as an innovative approach for delivering electronically mediated, well-designed, learner-centered, and interactive learning environments to anyone, at any place, anytime by utilizing the internet and digital technologies in concert with instructional design principles (Hedge and Hayward, 2004). Applications and processes of e-learning include web-based learning, computer-based learning, virtual classrooms, and digital collaboration, where contents is delivered via the internet, intranet/extranet, audio and/or video tape, satellite TV and CDROM (Islam, 1997). E-learning is now a multi-billion dollar activity worldwide. The rapid and intensive use of ICTs in education in the developed countries facilitated the establishment of 100% ICT-based universities called 'virtual universities'. In addition, many world-leading conventional universities are now also offering some of their academic courses through various ICTs for

their distant learners and established themselves as the dual mode universities'.

Cloud computing refers to the delivery of computing resources over the Internet. Instead of keeping data on your own hard drive or updating applications for your needs, you use a service over the Internet, at another location, to store your information or use its applications. (Office of the Private Commissioner of Canada, 2012).

The U.S. National Institute of Standards and Technology (NIST) defined cloud computing as follows:

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models.

The characteristics of cloud computing includes the following:-

- On-demand self service, this means that customers (usually organizations) can request and manage their own computing resources.
- Broad network access - This allows services to be offered over the Internet or private networks.
- Resource pooling – Here customers can draw from a pool of computing resources, usually in remote data centres.
- Rapid elasticity and measure of service. This indicates that Services can be scaled larger or smaller; and use of a

service is measured and customers are billed according to their usage.

(Office of the Private Commissioner of Canada, 2012).

Service Models in Cloud computing (Figure 1) include Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS), Bhilare & Chakraborty (2013). The Software as a Service (SaaS) was one of the first implementations of cloud services. Here applications, required software, operating systems, hardware, and network are provided. In Platform as a service (PaaS) operating system, hardware, and network are provided, the customer installs or develops its own software and applications. In the Infrastructure as a service (IaaS), this involves the supply of hardware as a service, that is servers, network technology, storage or computation as well as basic characteristics such as Operating Systems and virtualization of hardware resources. (Fernández, Peralta, Herrera, and Benítez, 2010).

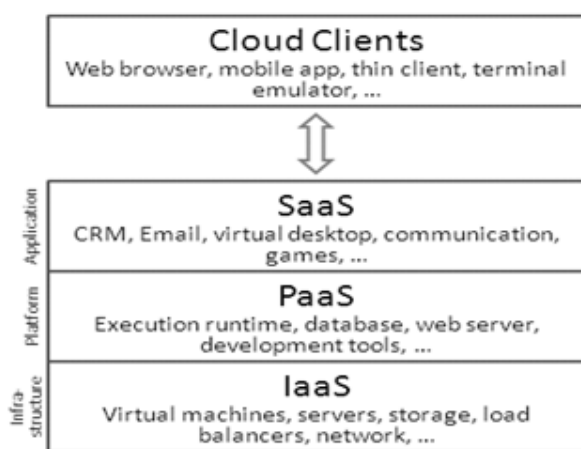


Figure 1: Cloud Service Models

Source: Bhilare & Chakraborty (2013)

The four deployment models of Cloud services are private cloud, community cloud, public cloud or hybrid cloud (Luit Infotech, 2012).

Services provided by a Public cloud are over the Internet, also called external cloud. The resources are dynamically provided by a third party. Some examples include services aimed at the general public like online photo storage services, e-mail services, or social networking sites.

For a community cloud the service is usually shared by several organizations and made available to only those groups. Community based cloud is a much more expensive option compared to a public cloud. It however offers a higher level of privacy, security and /or policy compliance. The infrastructure may be owned and operated by the organization or by a cloud service provider.

Private cloud involves an offering that deploy cloud computing on private networks. The infrastructure is owned and operated by the organization or by a cloud service provider. It is made up of applications and virtual machines in the organisations own set of hosts. According to Luit Infotech (2012), Private cloud also provide the benefits of

utility computing like shared hardware costs, the ability to recover from failure and the ability to scale up or down depending upon demand.

The history of distance education can be traced to the 19<sup>th</sup> century when Europe and the United States of America (USA) who are considered as the pioneers of distance education used the postal system to make education open to people who wanted to learn but were not able to attend conventional schools. Most people who fall into this category were those with physical disabilities, women that were not allowed to enroll in educational Institutions open only to men, those with jobs during normal school hours and those that live in remote areas where there were no schools.

A model can be defined or explained in different ways. It is usually seen as a representation of something. It may not capture all attributes of the represented thing, but rather only those seeming relevant. Models are usually created for certain purpose and stakeholders. A model in science is anything used as a representation of an object, law, theory or event used as a tool for understanding the science world. A model can be a representation of a selected part of the world or a theory in the sense that it interprets the laws and axioms of that theory. Examples of models in science include: billiard ball model of a gas, the Bohr model of the atom, the Gaussian-chain model of a polymer, the Lorenz model of the atmosphere and the double helix model of DNA. (Ask.com, 2013). A model is a device, demonstration, equation, picture or replica of something else. One word that is often used to describe a model is "analogue." (eHow.com, 2013). This is the sense in which the word model is used in this paper.

In Software Development, there are a number of models used; these models are the various processes or methodologies that are being selected for the development of the project depending on the project's aims and goals. There are many development life cycle models that have been developed in order to achieve different required objectives. The models specify the various stages of the process and the order in which they are carried out. The type of model used to an extent determines the testing that is carried out. For example, it will define the what, where and when of a planned testing, influence regression testing and largely determines which test techniques is to be used. Examples of the various Software development models or methodologies are Waterfall model, V model, Incremental model, RAD model, Agile model, Iterative model, and Spiral model.

## 2. Background to the Study

Nigeria has one single mode open university- the National Open University of Nigeria (NOUN) as well as six dual mode universities [conventional universities with distance learning centres] recognised by the National Universities Commission. These are i.e. the Universities of Ibadan, Lagos, Abuja, Maiduguri, Obafemi Awolowo University, Ile-Ife and Federal University of Technology, Yola. Total enrolment in the distance learning programmes of NOUN and the six dual-mode universities is about 100,000 with great potential to offer more opportunities for qualitative university education,

to the teeming masses of Nigerians, if well resourced, coordinated and properly regulated (Ramon Yusuf, (2011) in Okebukola, 2013).

Fortunately, the NUC has provision for Universities to run a dual – mode University if they meet the requirement. Some of these requirements are discussed in the later part of this paper.

### 3. Statement of Problem

The Joint Admissions and Matriculations Board, JAMB, concluded the 2013 Unified Tertiary Matriculation Board, UTME, on Saturday 27<sup>th</sup> April 2013. The admission crisis facing the nation became glaring as it was revealed that only 500,000 out of the 1.7 million candidates who sat for the examination will be admitted into the available universities in the country, this brought to the fore why thousands of Nigerian students populate universities in UK, South Africa, Ghana, Malaysia and other countries where they can access easier admission. Gaining admission in Nigeria has become more difficult as millions of qualified candidates cannot get placement into Nigerian Universities.

The former Minister of Education, Ahmed Rufai (2013) confirmed that only 500,000 candidates will gain admission despite the number of applicants, in an interview after monitoring the conduct of JAMB examination in Abuja. She bemoaned the gross inadequate numbers of Universities in the country appealed for more public private partnerships for the establishment of more institutions to increase access to university education in Nigeria, ScanNews (2013).

Bamiro (2012) in Okebukola (2013), a former Vice-Chancellor, University of Ibadan while leaving office in 2012 had observed that there is need for re-engineering and restructuring of open university education system vis-a-vis distance learning programme, for its effective functioning in the country. This according to him, will go a long way in reducing the increasing number of admissible but not admitted candidates applying for admission into tertiary institutions in the country yearly. He further opined that:

The establishment of more universities may not have much effect in the sense that it is from the existing universities in the country that the proposed universities would source for workers, especially the lecturers. It is sad to note that Nigerian universities are under staffed in terms of lecturers. So, if Nigeria would promote and manage its open university system adequately as obtained in some advanced or some few developing countries, some of the higher education problems would be half solved. You need to know some of the problems we are facing in terms of admission. We have more than what we can absorb. This explains why some parents and candidates go to any length to ensure that they get admission

He added that the development of Information Communication Technology (ICT) would enhance the

operations of distance learning programmes in the country.

Table 1 shows the enrolment figures of the open and distance learning programmes in the Nigerian Universities as of June 2011.

**Table 1**  
**Student Enrolment in Open and Distance Learning Programmes in Nigerian Universities as at June, 2011.**

S/No	UNIVERSITY	TOTAL ENROLMENT
1.	Ibadan	14,500
2.	Lagos	12,000
3.	Abuja	18,300
4.	Maiduguri	3,624
5.	FUT, Yola	1,204
6.	OAU Ile-Ife	5,000
7.	NOUN	42,898
	GRAND TOTAL	97,526

Source: Ramon-Yusuf, 2011

### 4. Aims and Objectives of the Study

This paper is intended to highlight the major advantages of a Cloud based E-Learning model for open and distance learning in Nigerian Universities. The paper will also highlight how a Cloud based E-Learning model will help Nigerian Universities to implement flexible and successful E-Learning program.

### 5. Significance of the Study

The design and implementation of a Cloud based E- learning model will make it possible for higher Institutions in Nigeria to admit more students into their programs. Many professionals and workers will be able to further their education while working, the inability to go to school without leaving ones jobs at the present time is a major challenge to many workers. It is hoped that a fully Integrated E-Learning system when fully implemented will address these problems.

#### **Suitability of Cloud Computing for E-Learning in Nigerian Universities.**

Cloud based E- Learning can be seen as Education Software-as-a-Service, Frnandez et al, (2012). The deployment of the system can be done very fast with minimum cost. The burden of maintenance and support from the Universities to the vendors is also lessen, this allow for focus on the core business of learning, teaching and research. Masud and Huang in Zhu (2011) highlighted the consequences and implications of the development of E- Learning services in Cloud computing environment as follows:

- **Accessed via Web:** It implies an ease of access from anywhere and at any time, one can also have access any of the application, this makes for greater demand for Web Development skills.
- **No client-side software needed:** These reduces the costs for subscriber, as no installation, software maintenance,



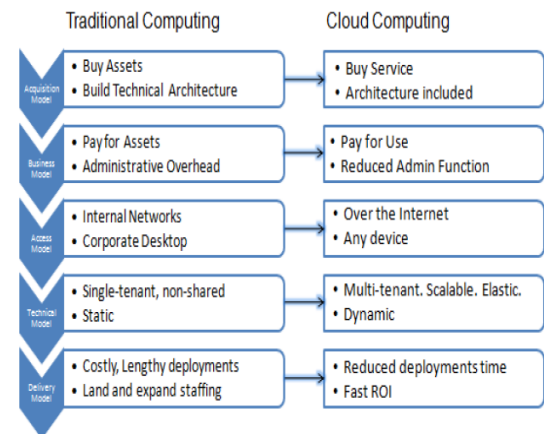
deployment and server administration costs, and a lower total cost of ownership, reduced time-to-value, fewer IT staff is needed by the Institution.

- **Pay by subscription based on usage:** This is suitable for Software Model Education market, users can also gain access to more sophisticated applications.
- **SaaS server may support many educational institutions:** Since the application is running on a server farm, the scalability is inherent to the system. As student usage grows, the software performance will not degrade.
- **All subscriber data held on SaaS server:** Very high level of security is needed by SaaS provider in order to gain trust of subscribers and sophisticated multitenant software architecture. The subscriber data is distributed between many providers and it must be integrated in order to gain overview of business, higher demand for system and data integrators.

There are many potential values of cloud computing for education according to Ouf et al in Fernendez et al (2012). Some of these are:

- There is no need for backing up everything to a thumb drive and transferring it from one device to another. This also means students can create a repository of information that stays with them and keeps growing as long as he wants them.
- Crash recovery is nearly unneeded. If the client computer crashes, there are almost no data lost because everything is stored in the cloud (Pocatilu, Alecu, and Vetrici; 2010).
- Allow students to work from multiple Places (home, work, library ... etc), find their files and edit them through the cloud and browser-based applications can also be accessed through various devices (mobile, laptop and desk top computers, provided internet access is available) (Al-Zoube, El-Seoud, Wyne; 2010).
- Flexibility: Scale infrastructure to maximize investments. Cloud computing allows user to dynamically scale as demands fluctuate (Ercan; 2010).
- Improved improbability : it is almost impossible for any interested person (thief) to determine where is located the machine that stores some wanted data (tests, exam questions, results) or to find out which is the physical component he needs to steal in order to get a digital asset (Pocatilu, et al; 2010).
- Virtualization: makes possible the rapid replacement of a compromised cloud located server without major costs or damages. It is very easy to create a clone of a virtual machine so the cloud downtime is expected to be reduced substantially.
- Centralized data storage: losing a cloud client is no longer a major incident while the main part of the applications and data is stored into the cloud so a new client can be connected very fast. Imagine what happens today if a laptop that stores the examination questions is stolen.
- Monitoring of data access becomes easier in view of the fact that only one place should be supervised, not thousands of computers scattered over an extensive geographical area, for example. Also, the security changes can be easily tested and implemented since the cloud represents a unique entry point for all the clients (Wheeler & Waggener; 2009).

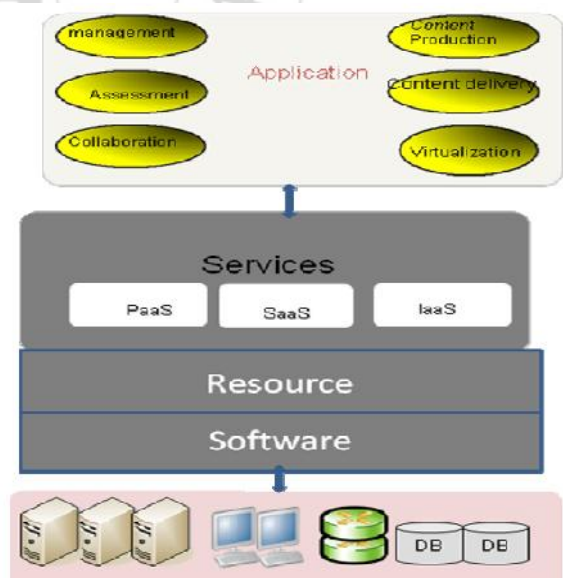
A comparison of traditional computing and cloud computing according to Masud & Huang (2012) is shown in figure 2.



**Figure 2:** Comparison of Traditional Computing and Cloud Computing

Source: (Masud & Huang; 2012)

The proposed cloud based E- learning architecture is divided into the following layers; Infrastructure layer as a dynamic and scalable physical host pool, software resource layer that offers a unified interface for e-learning developers, resource management layer that achieves loose coupling of software and hardware resources, service layer, containing three levels of services (software as a service, platform as a service and infrastructure as a service), application layer that provides with content production, content delivery, virtual laboratory, collaborative learning, assessment and management features. (Masud & Huang; 2012). This is shown in Figure 3.

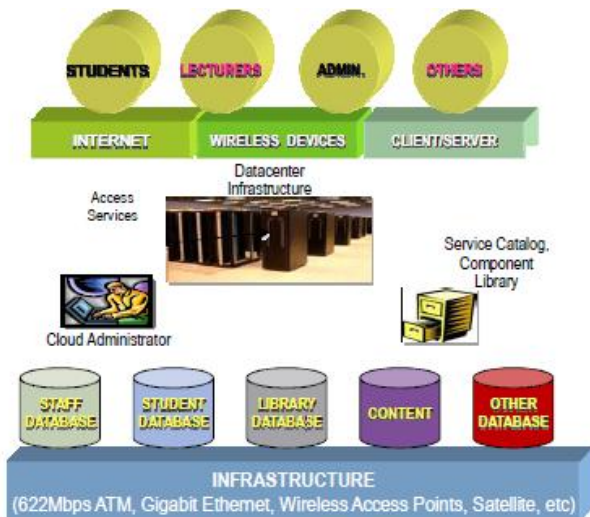


**Figure 3:** E-Learning Cloud Architecture: Source: (Masud & Huang; 2012)

#### Cloud Based E-Learning Architecture:

Infrastructure layer is composed of information infrastructure and teaching resources. Information infrastructure is made up of the following Internet/Intranet, system software, information management system and some common software and hardware; teaching resources is accumulated mainly in

traditional teaching model and distributed in different departments and domain. This layer is located in the lowest level of cloud service middleware, the basic computing power like physical memory, CPU, memory is provided by the layer. Through the use of virtualization technology, physical server, storage and network form virtualization group for being called by upper software platform. The physical host pool is dynamic and scalable, new physical host can be added in order to enhance physical computing power for cloud middleware services. Figure 4 depicts this in a clearer view.



**Figure 4:** Proposed Infrastructure Layer in an expandable view. (Masud & Huang; 2012)

B. Software resource layer mainly is composed of operating system and middleware. Through middleware technology, a variety of software resources are integrated to provide a unified interface for software developers, so they can easily develop a lot of applications based on software resources and embed them in the cloud, making them available for cloud computing users.

C. Resource management layer is very important in achieving a loose coupling of software resources and hardware resources. Through integration of virtualization and cloud computing scheduling strategy, on-demand free flow and distribution of software over various hardware resources can be achieved.

D. Service layer has three levels of services namely, SaaS (Software as a service), Paas (Platform as a service), IaaS (Infrastructure as a service). In SaaS, cloud computing service is provided to customers. As is different from traditional software, users use software via the Internet, and do not need to purchase software and hardware, and they do not need to maintain and upgrade software, and they simply pay a monthly fee for using the infrastructure.

E. Application layer is the specific applications of integrating the teaching resources in the cloud computing model, including interactive courses and sharing the teaching resources. The interactive programs are mainly for the teachers, according to the learners and teaching needs, taken

full advantage of the underlying information resources after finishing made, and the course content as well as the progress may at any time adjust according to the feedback, and can be more effectiveness than traditional teaching. Sharing of teaching resources include teaching material resources, teaching information resources (such as digital libraries, information centers), as well as the full sharing of human resources. This layer mainly consists of content production, educational objectives, content delivery technology, assessment and management component (Xin-ping , Zhi-mei & Jian , 2010).

The Cloud based E-Learning model being proposed for open and Distance Learning in Nigerian Universities is based on the National University Commission (NUC) guideline for Open and Distance Learning (ODL). These guidelines cover the following areas.

#### **Learners' readiness, foundation, qualifications and background.**

For ODL programs all entrants into degree programmes offered must meet the minimum national requirements for university admission. This requirement is to ensure that all programs run by Universities meet the minimum required standard by NUC. This also ensures that all students running the program have the required foundation and are ready for such program.

Readiness implies a degree of concentration and eagerness. Individuals learn best when they are physically, mentally, and emotionally ready to learn, and do not learn well if they see no reason for learning. Getting students ready to learn, creating interest by showing the value of the subject matter, and providing continuous mental or physical challenge, is usually the instructor's responsibility. If students have a strong purpose, a clear objective, and a definite reason for learning something, they make more progress than if they lack motivation. In other words, when students are ready to learn, they meet the instructor at least halfway, simplifying the instructor's job.

Since learning is an active process, students must have adequate rest, health, and physical ability. Basic needs of students must be satisfied before they are ready or capable of learning. Students who are exhausted or in ill health cannot learn much. If they are distracted by outside responsibilities, interests, or worries, have overcrowded schedules, or other unresolved issues, students may have little interest in learning.

#### **Pedagogy types should be varied and should accommodate student's needs:**

According to NUC guidelines, "Learning objectives should be well defined; Pedagogy should be appropriate to meet the Learning objectives; for all academic programmes offered by ODL, well written Study guides should lead the study, Programmes should be updated at appropriate frequency". Pedagogy should include Instructor led, social Networking and collaborative learning methods.

The University of Central Florida (2009) noted one of the implicit goals of any instructional setting is to provide

students with the opportunity to interact with the course content, the instructor, and other students. An advantage of the E –Learning learning environment is the increased potential for students (individually or in groups) to make personal meaning from course content. They observed that John Dewey introduced interaction to education in 1916 which he referred to as a form of internal interaction as the defining component of the educational process that occurs when the student transforms the inert information passed to them from another and constructs it into knowledge with personal application and value, Interaction examples include collaborative and cooperative learning groups.

Learning activities provide students with the opportunity to work together and interact. Collaborative learning can be effective in that it is a means for students “to think out the content that has been presented and to test it in exchanges with their peers” (Moore & Kearsley, 1996).

#### **Use of Adequate E - Learning resources:**

NUC stated that learning resources should be tailored to ODL, The resources are to be interactive, comprehensive, accessible, contemporary etc; Make appropriate use of media and ICT and it meet international quality standards.

It is believed that Social Presence is very important in E – Learning environment, according to HRC Hanover (2009), When participants in an online course help establish a community of learning by projecting their personal characteristics into the discussion — they present themselves as —real people, they noted that there are at least three forms of social presence:

- Affective. The expression of emotion, feelings, and mood.
- Interactive. Evidence of reading, attending, understanding, thinking about there responses.
- Cohesive. Responses that build and sustain a sense of \_belongingness, ‘ group commitment, or common goals and objectives.

## **6. Evaluation and assessment methods**

A good E-Learning program should have the following components of assessment tools in order to be effective, Self Assessment Practice; Grade Assessment (Pre-test/Post-test) ; Course Assessment (Formative assessment) ; and Course assessment (Summative), (University of Central Florida, 2009)

**Self Assessment Practice:** This allows students to track their progress to ensure they have mastered the course information. Practice provides the students with the opportunity to master course materials before proceeding to the next level of instruction. For example, quizzes built into the course allow the student to get immediate feedback on their mastery of the content and to continue to the next level. If a student fails to master or understand the information, they can identify difficulties they are experiencing and either asks for help or continue in their practice of the materials.

**Grade Assessment (Pre-test/Post-test):** The importance of pretests is twofold. First, is to determine the skills or knowledge the students may already possess about the course materials. Second, pre-testing serves as a means to measure the improvement in the skills or knowledge the students acquired from the presentation of the course materials.

**Course Assessment: (Formative):** Throughout a course, an instructor need to look at student’s test results, as well as the reactions and suggestions from students to determine what problems may exist in the duration of the course materials, as well as if the course objectives are being met. The information provided by the students can then be implemented to revise the course materials throughout the delivery of the course materials.

**Course Assessment: Summative:** Upon completion of a course, summative evaluations should be utilized to measure if the course objectives were met. Post-tests and/or final exams can be used as a means of summative evaluations. Student reactions toward the overall course can also be determined from the student evaluations at the end of the term. A good E – Learning program should have tool that can be used to deliver evaluations.

#### **Staffing/Instructors**

Facilitators should have Learning Contracts that will specify the work required to obtain each grade level (A, B, C), when this happens, it is up to the student to determine the grade level they desire and the amount of work they are willing to do to earn the grade. Learning contracts may be informal where a student simply turns in the appropriate assignments for the desired grade or a written contract agreed to in advance. If a written contract is required, you need to provide a procedure to submit the contracts via e-mail.

There is need for adequate and Timely Feedback by Instructors, they need to provide two types of feedback: information feedback and acknowledgment feedback. Sometimes a simple auto-reply to an e-mail is adequate when a student’s submits an assignment via e-mail. The Learning Management system utilized should offer instructors the ability to return feedback in the Assignment tool, Quizzes, Discussions and via e-mail.

#### **Academic Learner Support; Information, Advice and Guidance (IAG)**

Keegan stated that the term ‘student support services’ is used for those parts of a distance or electronic learning course which are additional to the provision of course content. These student support services can be either ‘learner support’ or ‘learning support’. Learner support comprises all the assistance provided by a distance education or an E-learning system which matches the facilities which a face-to-face system provides for the success of its students.

Learning support lists the assistance provided by the institution in the actual process of learning to ensure that the learning tasks are performed successfully.

It is generally believed that the first 100 years of distance education were fraught with difficulties. Distance



accreditation was not accepted, the correspondence image was rejected, university professors criticized education at a distance.

Keegan noted that it was not until the foundation of the open universities in the 1970s that this image began to change. According to him the course materials produced by the Open University of the United Kingdom, the FernUniversität in Hagen in Germany and the Universidad Nacional de Educación a Distancia in Madrid, Spain were highly praised, it was the student support services and feedback provided by these universities that enabled distance education to come of age.

A good distance education institution should provide interpersonal communication and feedback, as well as course content, by a range of facilities known as student support services. The role of the student support services is to guarantee the validity of the educational process by providing structures for interpersonal communication and feedback in the distance education system. Student support services are crucial in the accreditation process of distance education courses and the decision of national and international bodies to award university degrees, college diplomas and training certification for studies done at a distance. Keegan stated that "there never was question of awarding degrees, diplomas or certificates for Teach Yourself Books or Packages but it was one of the great successes of distance education that gradually nationally and internationally recognised certification was awarded for distance education courses, even at degree level. Today a B.A. Open degree from the British Open University is as valid a degree for employment purposes or for post-graduate research studies as a degree from another British university".

A grid developed for the analysis of student support services in E-learning by the Socrates project 'Student Support Services in E-learning' identifies clusters of tools under the headings 'learner support' and 'learning support'.

The learner support grid comprises:

- Information Phase
- *Guidance Phase*
- Registration Phase
- Integration Phase
- Final Results Phase
- Accreditation Assistance Phase
- Guidance on Further Study Phase

Learning support lists the assistance provided by the institution in the actual process of learning. This is the Learning Phase which facilitates online learning. Online learning typically occurs via access to E-Learning content, discussion forums, bulletin boards, email queries, telephone support, group work. These structures support both student to student and student to tutor interaction.

Tait (2003) of the Open University of the United Kingdom gave a reflective analysis of the role of student support services in distance education. He noted that the main reasons for having student support integrated in an ODL system are:

#### 1. Students want support

The first of these is that students want it. While this might be said to be pedagogically weak in the theoretical sense, it is important for the best of reasons. In the OU UK student feedback tells us that some 10 per cent of students do not want interaction with other students, having perhaps a personality type that has led them to choose a study mode that reduces or removes the need for interaction with others. However, for the other 90 per cent, this is looked for, albeit not always taken up because of the demands on time and place that are so prevalent in the lives of adult learners.

#### 2. The reduction of drop-out

Student support, especially student guidance and counselling, tutor support, and effective information and administrative systems all provide a range of activity that impacts not only in terms of teaching but also affectively, that is to say reinforcing the student sense of confidence, self-esteem and progress.

#### 3. The nature of learning

A further mode of explanation for student support, especially for tutoring in group work in study centres or online and in the teaching given through the return of assignments, lies in the impact this makes on the learning process. Essentially this has been termed 'mediation,' that is the role that the tutor performs in relating the teaching content to the student as an individual in her or his situation, including the social, economic, geographic and cultural dimensions.

A Swedish scholar, Baath, had argued that there were four types of students enrolled in distance education systems:

The four categories of students according to him are :

- students who need student support services but don't want them
- students who need student support services and want them
- students who don't need student support services but want them
- Students who neither need nor want student support services.

The provision of feedback is an important dimension of the education process and feedback on student work is a characteristic part of student support services.

### 7. Quality Control, Copyright issues, Accreditation Issues

Ipaye (2007) stated that "Quality means fit for purpose , Quality assurance is the process of ensuring that fitness for purpose; Quality assurance could thus be defined as a set of procedures designed to ensure that quality standards and processes are adhered to, and that the final product meets or exceeds the required technical and performance requirements".

He further asserted that Quality assurance covers activities including, but not limited to, product design, development, production, installation, and servicing, as well as proper and effective utilization.

Nichols (2002) observed that Quality is made up of many elements. For eLearning products, the following is suggested as quality criteria (based on Garvin, 1988):

- Performance – the finished product should operate in an effective way, as determined by the end-user.
- Features – the ‘bells and whistles’ incorporated into the finished product should be appropriate, and not detract from the overall objectives of the project.
- Reliability – the finished product should not be subject to malfunction.
- Conformance – the finished product should comply with industry standards, using standard technologies (though those technologies can be pushed to their utmost) and reflect established education theory.
- Durability – the finished product should be relevant and either timeless (in the case of teaching established principles) or easily updated.
- Serviceability – it should be easy to repair or adjust the finished product as required.
- Aesthetics – the overall ‘feel’ of the finished product should be professional and user-friendly.
- Perceived Quality – the finished product should enhance the reputation of UCOL as a quality eLearning provider.

Many of African universities had started the dual-mode of distance education whereby the universities provide distance education to off-campus students by various means including on-line provisions, many of this Distance Education is often implemented in form of e-learning or on-line learning by external providers. Often such educational provision is not indigenous to the country since it is transported from the developed nations with all the features of a ‘Northern design’, and exported across the border into the recipient African country. In order to ensure quality of these programs, there is need to carry out a need assessment of what is available and What is required by the individuals, the system and the programme, as well as what hardware and software are required and to what level of efficiency.

Usually, one of the most important steps never to be missed while producing materials for e-learning in Africa is to conduct a learning needs assessment before ever starting the delivery of instructions.

Conclusion, Cloud computing though relative new has proven to be a major way to go with regards to E-Learning, Most developed Countries have been able to rapidly and intensively use ICT to provide E-Learning through the establishment of Virtual Universities. E-Learning as a multibillion dollar activity provide an opportunity for Nigeria to meet her higher educational needs as well as conserve her scarce foreign exchange by drastically reducing the number of people going abroad for university education.

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