e-Granary Electronic Library: A Panacea for Effective Low-Cost Means of Knowledge and Lecture Delivery for Distance Learning in the National Open University of Nigeria

Bibliothèque électronique E-Granary: Une panacée pour des moyens efficaces et peu coûteux de transmission de connaissances et de cours magistraux pour l'enseignement à distance à l'Université nationale ouverte du Nigeria

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Abstract

e-Learning is virtual learning process in which a learner stays in one place and explores as well as interacts with knowledge anywhere and at any time through electronic means. This e-learning is first choice for distance education. The electronic library also known as digital library, an online library, an Internet library, a digital repository, or a digital collection will be a great support to e- learning. This digital library embraces an online database of digital objects that can include text, still images, audio, video, digital documents, or other digital media formats to be accessible through the Internet. The accessibility of this information digitally in university libraries could be expensive. The remedy could be to embrace the use of the egranary Digital Libra ry which is an offline information store that provides instant access to digital resources for those lacking adequate Internet connections. A single e-Granary, connected to a wired or wireless local area network (LAN) helps to solve the situation. The research work investigates the concept of e-Granary Digital Library and its usefulness for developing distance education especially in the rural areas of Nigeria, features of e-Granary digital library, e-Granary Digital Library Implementation, benefits of e-Granary Digital Library to the development of distance

learning , steps for using digital library for executing distance learning education, importance of e-Granary Digital Library for the development of distance learning programmes and problems of e-Granary digital as a mode of lecture delivery, conclusion and recommendations were made.

Keywords: e-Learning, Wireless Local Area Network, distance learning, Cost effective, E-Granary digital library

Résumé

La formation en ligne est un processus d'apprentissage virtuel dans lequel l'apprenant reste à un endroit et explore et interagit avec la connaissance n'importe où et à n'importe quel moment par le biais de moyens électroniques. L'apprentissage en ligne est le premier choix pour l'enseignement à distance. La bibliothèque électronique, également connue sous le nom de bibliothèque numérique, bibliothèque en ligne, bibliothèque Internet, dépôt numérique ou collection numérique, sera d'un grand secours pour l'apprentissage en ligne. Cette bibliothèque numérique englobe une base de données en ligne d'objets numériques qui peuvent inclure du texte, des images fixes, de l'audio, de la vidéo, des documents numériques ou d'autres formats de médias numériques accessibles par l'intermédiaire de l'internet. L'accessibilité de ces informations sous forme numérique dans les bibliothèques universitaires pourrait s'avérer coûteuse. La solution pourrait être d'adopter l'utilisation de la bibliothèque numérique e-Granary, qui est un magasin d'information hors ligne offrant un accès instantané aux ressources numériques pour ceux qui ne disposent pas de connexions Internet adéquates. Le travail de recherche étudie le concept de bibliothèque numérique e-Granary et son utilité pour le développement de l'enseignement à distance, en particulier dans les zones rurales du Nigeria, les caractéristiques de la bibliothèque numérique e-Granary, la mise en œuvre de la bibliothèque numérique e-Granary, les avantages de la bibliothèque numérique e-Granary pour le développement de l'enseignement à distance, les étapes de l'utilisation de la bibliothèque numérique pour l'exécution de l'enseignement à distance, l'importance de la bibliothèque numérique e-Granary pour le développement du

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programme d'enseignement à distance et les problèmes de la bibliothèque numérique e-Granary en tant que mode de transmission des cours, une conclusion et des recommandations ont été formulées..

Mots-clés : L'apprentissage à distance, le Réseau Local sans Fil, Les Etudes à Distance, la Rentabilité, Bibliothèque Numérique e-Grenier,

Introduction

The need for e-Granary electronic libraries cannot be overstated to provide information and knowledge for human resources in all works of life. E-Granary's digital library is an external hard drive designed for users in low-income communities and also known as "Internet in a Box", The e-Granary Digital Library — "The Internet in a Box" — is an off-line information store that provides instant access to over 35 million digital resources for those lacking adequate Internet connections (Abifarin, 2004).

The e-Granary plays a basic role as an offline digital library that provides electronic library resources to the university. This can be accomplished by copying websites (with copyright permission) and sending them to intranet web servers inside the university, providing millions of documents that are instantly accessible over a local area network (LAN).There are other relevant websites available in the e-Granary. The e-Granary contains several databases on different academic subjects such as agriculture, computer science and mathematics. Others include e-journals, e-books, online tutorials, free software downloads, and more. The basic functions of the e-Granary digital library are known for using innovative offline storage technology to deliver millions of digital documents to schools, clinics, hospitals and homes in the developing countries with little or no Internet connection. It helps to provide users with instant access to a wide range of websites, audio, video and multimedia resources from the institution's local area network (LAN). The e-Granary digital library demonstrates a new, cost-effective way to provide global information and knowledge in poor areas.

e-Library (electronic library) is a synonym for virtual and digital libraries. The electronic library has been defined in different ways by different scholars, depending on their individual or organizational perspective. Issa, Jerry and Muhammed (2009) confirmed that the term electronic library is used as a synonym for digital, universal, future, community and library without walls. Nebeolise (2019), in his own perspective, refers to the digital library as an electronic library in which the collections are stored in electronic format such as CD-ROMs, flash drives, SD cards (as opposed to printed materials) and are used over computers. In addition, it states that the virtual library is an Internet-based digital library or libraries without walls. The content of a virtual library simply means that anyone with a computer and a connection to library networks can access not only the library's resources, but also a wide variety of information available over national and inter-national networks once the networks are available without being physically present in the library.

In fact, most of the academic libraries around the world including Nigeria are struggling with problems such as lack of funds to acquire needed information resources, subscribe to printed resources and even electronic resources and competent librarians adapted to the digital age. Software and hardware are another potential problem in the digital age in developing countries; others are the human resources to handle the technologies effectively and the instability of the electricity supply. The challenges occur in academic libraries in many countries and have great significance for the development of education in the nation (Omekwu, 2002).

In view of the above challenges, the provision of e-Granary digital libraries for distance learning is becoming very important as digital libraries provide access to information resources such as databases, e-journals, electronic-books (e-books), notification services, special collections and CD-ROMs, online reference works, and these improve the quality of teaching and research (Lee, 2008). Therefore, knowing the availability and use of these digital information resources (DIR) have become convenient for academic purposes. Since those looking for information are no longer satisfied with printed materials alone, only digital information remains in the digital age.

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Digitisation improves access to library resources, and through the digitization of library holdings, information will be accessible to all and not to just a group of researchers. Digital projects enable users to quickly and comprehensively search collections anytime, anywhere. Digitisation makes visible what is invisible. Multiple users can access the same material at the same time without hindrance. It also eliminates the problem of distance since users do not have to travel to libraries that hold printed copies of library materials before they can access and use those materials.

Distance learning is gradually being recognised as an outstanding means of educating a large number of students in Nigeria recently. It's still a relatively cheap and easy way to house those who, for one reason or another, have dropped out of the school system. It is also a new tool to solve the yearly problem of traditional higher education institutions' inability to absorb large numbers of qualified candidates seeking a place in the relatively few places available in the country's higher education institutions (Abifarin, 2004).

Distance learning refers to a form of instructional delivery that does not require students to be physically present at the same location as the teacher (Steiner, 2002).In light of the above discussion; the researcher has found the importance of the e-Granary digital library for effective education for distance learning.

Many distance learning students are mainly seen in urban and rural areas in most countries around the world (Popoola, 2018). A case in point is National Open University of Nigeria (NOUN) students who can be found in every part of Nigeria where facilities such as web, Internet and other Internet facilities facilitate access to programmes in one way or another. Through a process of copying web sites (with permission) and putting them on the internal networks of our partner institutions, the e-Granary delivers instant access to a wide variety of educational resources including video, audio, books, journals, and websites.

The e-Granary is much more than just static information: the digital library contains built-in tools for subscribers to upload and edit local materials as well as create and edit their own websites, which are stored locally. A single e-Granary, connected to a wired or wireless local area network (LAN), can serve thousands of patrons and has been adopted by over 2,000 institutions. In support, Nwosu (2012) stated that the January 2009 survey on the web presence of 70 higher institutions in Nigeria found that 46 of Nigerian universities had an online web presence and 24 did not. Some universities have a significant web presence and a case in point is the National Open University of Nigeria, Abuja (NOUN). Nevertheless, there are still some hindrances altering the effective means of knowledge and lecture delivery for distance learning.

This problem could be better solved by finding other means to reach distance students in their different locations. The use of the e-Granary digital library represents an alternative solution that provides an appropriate solution to the problem created by the urban-rural dichotomy in Nigerian society.
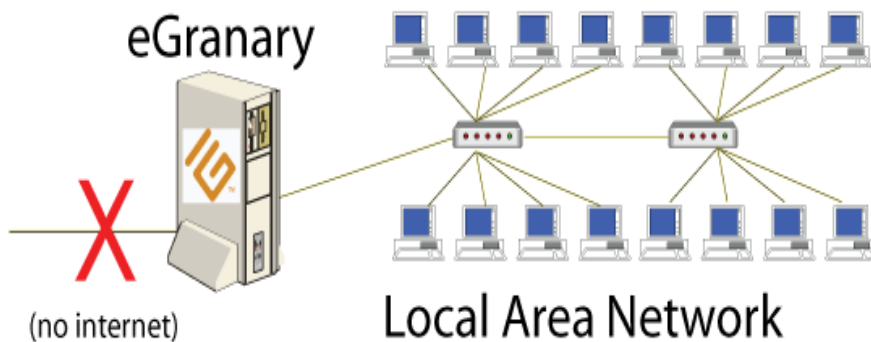
Concept of e-Granary Digital Library

The e-Granary Digital Library can be viewed as a mini Internet resource for various schools in developing countries without adequate Internet connections. It is a collective effort of hundreds of authors, publishers, programmers, librarians, teachers, and students from around the world (Abifarin, 2010). The e-Granary Digital Library is also the Internet in a box and an offline information store, providing instant access to over 35 million digital resources for those without a sufficient Internet connection Purbo (2020). A single e-Granary connected to a wired or wireless local area network (LAN) can serve thousands of customers.

An e-Granary digital library stores educational resources over a local network to reduce connection costs in areas with poor Internet access. Most e-Granary subscribers don't have an Internet connection, but

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those who do can open resources from e-Granary Digital library up to 5,000 times faster than an ordinary library with Internet connection.

A large number of students in the developing world have little or no access to the Internet and its wealth of educational resources (Wright, Dhanarajan and Reju, 2009). The e-Granary digital library offers more than 30 million educational resources over a local network without Internet access. For countries with low literacy rates, high Internet access costs, and other barriers that hinder students and educators, this "Internet in a Box" helps close the gap between Internet usage in developed and developing countries.

A Diagrammatic representation of e-Granary

E-Granary is an offline server hosting millions of websites, videos, tutorials and software programs accessed from computers, tablets and smart phones over a local area network (LAN). This "Internet in a Box" works and feels just like the Internet, but is thousands of times faster over the LAN and completely secure. By copying websites (with permission) and localizing them on the internal networks of our partner institutions-Granary provides instant access to a wide variety of educational resources including video, audio, books, magazines and websites covering dozens of subjects ranging from engineering and medicine to horticulture and music. Over 35 million resources hosted on e-Granary are fully indexed and searchable with our powerful built-in search engine. In addition, users can upload their own content and

create or edit tons of websites using integrated software called
Community Information Platform.

Features of e-Granary digital library

The e-Granary possesses some features or characters and are as
follows-:
❖   No Physical Restriction
❖   Multiple Access
❖   Easy-to-Use
❖   Conservation and Preservation
❖   No Limitation of Space
❖   Scope of Improvement
❖   More Than a Library
❖   Not Time-Bound

Benefits of e-Granary Digital Library

The e-Granary digital library performs many roles and some of the
benefits are-:

i.   The e-Granary digital library supports quick access to
       educational materials, including video, audio, books,
       magazines and websites, even when there is no Internet access
       (Wider Net Project (2001).
ii.   The e-Granary digital library makes millions of digital
       educational resources available to institutions that do not have
       adequate access to the Internet (Wider Net (2010)
iii.   e-Granary helps copy websites and submits them to Internet
       web services INSIDE their respective institutions in developing
       countries through a permission-seeking process.
iv.   e-Granary Digital Library provides millions of multimedia
       documents that users can instantly access local area networks
       (LAN) free of charge
v.   In developing countries, the E-Granary digital library helps
       bring millions of Internet resources to institutions that do not
       have adequate Internet access by copying and submitting
       websites to Internet web servers in partner institutions.

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vi.   The e-Granary Digital Library provides educational materials for instant access over local area networks (LANs).

vii.   The e-Granary Digital Library provides those who do not have adequate Internet access with an offline access link to approximately 14 million educational resources and more than 1,200 websites and hundreds of CD-ROMs.

viii.   The e-Granary digital library has collections totaling more than 50,000 books, hundreds of full-text journals and dozens of software applications (Wikipedia, 2010).

Steps for Lecture Delivery to the Rural Based Distance Learning Students through e-Granary Digital Library

❖   Establishment of Study Centers in the Rural Areas: The study centers could be located in the local government headquarters or in the district headquarters. These study centers should be well equipped with all the necessary facilities that will enable the e-Granary Digital Library function well. It is important that computer laboratories or cybercafés are provided to house the e-Granary Digital Library equipment. There is the need to provide comfortable seats to the students and technical officers handling the digital library. Should in case the centers are not connected to the national grid, it will be advisable to power the centers with generating plants.

❖   Availability of Course Materials Online: The distance learning facilitators should ensure that course materials for all courses offered by them are placed on the websites. The students in the urban areas can make use of the course materials directly from the net while the same materials are copied into e-Granary hard drive and added to the existing servers in the study centers for every distance learning student on the Local Area Network (LANs) to have fast and free access. Each of the study centers should be provided with separate e-Granary Digital Library equipment and facilities to operate on.

❖   Computer Literacy Training Programme: The students should be prepared for the utilisation of the e-Granary Digital Library.

The distance learning operators have to organize computer literacy training programme for their rural students most especially some of them that are not computer literate. After this training, the training for utilisation of the e-Granary Digital Library should follow. The students have to be trained on skills for accessing information online. This training will enable the distance learning students to cope with the use of the new e-Granary Digital Library technologies for their academic work adequately.

❖   **Experiment on the Use of e-Granary Digital Library:** The students should be encouraged to carry out practical on the use of e-Granary Digital Library personally. This is to enable them to be familiar with challenges they may encounter in the course of using the digital library. It is after they have mastered the use of e-Granary Digital Library that the students can be allowed to use the facilities on their own without much supervision.

❖   **Installation of e-Granary Digital Library for their Collective Usage:** A good number of students or wealthy students can come together with the sole aim of installing e-Granary Digital Library for their collective usage. This is because the cost of installing e-Granary Digital Library is relatively low compared with Internet installation. Therefore, in some rural study centers, the students can also contribute money for the installation of e-Granary Digital Library. The distance learning institutions can equally appeal to the federal, state and local governments, non-governmental organisations, telecommunication companies and other philanthropists to assist them in providing e-Granary Digital Library in their rural study centers for their students' usage.

❖   **The Advantage of e-Granary Digital Library with the Online Facilitators:** The distance learning facilitators in Nigeria together with distance learning institute of various universities and the national open university of Nigeria (noun) are suggested to embody the possibilities embedded with inside the

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use of e-Granary virtual library to reach their students most
especially those in the rural areas of the country.

Importance of e-Granary Digital Library to the Development of Distance Learning Programme

i. The use of e-Granary digital library, especially in the rural areas provides opportunity for the rural based students to develop and improve their basic Internet access skills.

ii. The e-Granary digital library makes available to the students or its users the very rich collections of works or information from varieties of authors, publishers, programmers, librarians, instructors and other authorities wherever they may reside most especially areas without Internet connectivity.

iii. e-Granary digital library is serving the purpose of bringing the Internet to the door steps of the users especially in the rural areas. This is because with e-Granary digital library. There is no problem of bandwidth cost which is always very high in the developing countries and great impediment to the provision of Internet connectivity in many countries in the developing world.

iv. It is equally a good alternative to the users in countryside who do not have access to information on the Internet. The e-Granary digital library affords them the opportunity to have access to very rich materials that are copied from the Internet.

v. e-Granary digital library provides cheap academic materials to the users especially schools in the developing countries that cannot afford to spend millions of dollars for their Internet connectivity.

vi. e-Granary digital library focus is to install the library in thousands of sites around the world. The multiplier effect of this is that, many students including those in the rural areas across the globe will have access to a lot of information on the Internet especially academic work through the e-Granary digital library.

vii.   The inventions of e-Granary digital library according to Abifarin (2010) is an advantage to the distance learning students most of whom are based in the rural areas where Internet connectivity is not available, he asserted that what is required is just for the management of such distance learning programme to install e-Granary digital library in their various study centers where Internet services is not available for the use of their students.

viii.   e-Granary digital library provides up-to-date and very recent academic information to their users based on the constant review of the contents from time to time. This is done through the use of WiderNet project staff and volunteers who work round the year to improve and increased the academic work or content collection of the e-Granary.

ix.   e-Granary digital library is cost effective especially when one compared the money spent on its installation with the numbers of users it serves. For instance, Abifarin (2010) asserted that "to install e-Granary digital library may cost less than one million naira in a university or other tertiary institutions. But the number of students and other users it will serve overshoot the cost of installation".

Problems to e-Granary Digital Library as a Mode of Lecture Delivery

❖   **Power Failure:** Power failure stand out as one of the great problem in the use of e-Granary digital library. Irrespective of the great advantages of the use of e-Granary digital library to distance learning programme, most rural areas are still not connected to the national grid for electricity supply which is a major impediment to the use of e-Granary digital library.

❖   **Funds:** e-Granary digital library is a newly developed learning technology. Therefore, enough funds will be needed to install the e-Granary digital library which most rural populace may not be able to afford despite its relatively low cost when compared

to Internet connectivity. Enough funds are also required for recruiting staff for the library and for maintain the facilities of the e-Granary digital library. Time should also be allotted to train the users on the basic skills for effective use of the equipment.

❖   **Insufficiency of Course Materials:** Notwithstanding, the richness of the materials in the e-Granary digital library, still its contents cannot be compared with what the Internet has. Stressing on this, some downloaded materials from the Internet may not be sufficiently enough for the academic needs of the students when compared with the Internet content that are updated on regular basis.

Conclusion

The invention of e-Granary digital library could be an immense advantage to development of education in the developing countries of the world. The problem is how e-Granary can be promoted in the University libraries and in the main, National Open University of Nigeria library. This is to ensure that both faculty and students adopt the cheapest e-learning in using the electronic digital library that is most suitable for the realisation of education and the goal of their prestigious institution. The area of education is being fortified regularly with new training technologies. E-Granary digital library is one of such innovations. The invention of e-Granary digital library is no doubt a major development in the art of teaching and learning. It is also a great contribution to the development of distance learning especially when consideration is given to adequate contact of the distance learning students in the rural areas. The e-Granary digital library should therefore be embraced by all distance learning institutions for better geographical coverage of their programmes.

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Recommendations

1. The federal, state and local governments should make available e-Granary digital library to all the schools lacking Internet connectivity in Nigeria.

2. The NOUN management should try to implement e-Granary digital libraries in the institution to ensure that all facilitators and students deliver their lectures and receive their lectures and other information respectively.

3. The National Universities Commission (NUC), non-governmental associations and other philanthropists should also assist the schools by assisting the schools and other tertiary institutions with Internet connectivity or at least the e-Granary digital library.

4. Experts should be engaged to train the teachers in different levels of education for adequate utilisation of e-Granary digital library new teaching technology.

5. Adequate and continuous training programme should be conducted in schools on Internet skills acquisition for both the staff and the students to enable them benefit adequately from the new training technologies in the classroom.

6. Adequate maintenance should be given to the e-Granary digital library equipment in order to enable it serve the users for a long time.

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