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**The Significance of Electronic Resources and Digital Library Theories for Skills  
Development of Library Staff in Nigeria**

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**Keywords:** Electronic Resources, Digital Library, Library Staff, Self-Efficacy, Wormell Model, Technology Acceptance Model, Skills Development.

**Abstract**

Theories provide a framework on which researches are built. They support and strengthen research and provide a basis of support on the topical issues studied. In this paper, electronic resources and digital library are discussed pointing out some of the resources that are needed for effective functioning of the digital library. The paper considered connectivity theory, self-efficacy theory, Wormell model, Technology Acceptance Model (TAM) and Theory of Reasoned Action (TRA) in terms of the propounder of the theory, year it was propounded and statement of the theory as well as their application to electronic resources and digital library environment. The paper suggests that, prospective researchers exploring the area of electronic resources and digital libraries can make use of these and other related theories to enrich their researches.

## **Introduction**

There has been a significant shift of emphasis from one writing material to another over the years. The format of library resources has also changed with the demand of time and the advances in technology through the ages. Stones and clay tablets gave way to papyrus and, parchments. The use of paper as an information holding document brought a great leverage to the users of the ancient writing materials. Thus books became the dominant information material of notable value then. Till now, books still remain relevant. However because of the flexibility of use of electronic based information materials, books are gradually being replaced by electronic materials. Many libraries have transformed and are transforming their resources through digitization process from paper to electronic.

According to Shidi (2011), 21<sup>st</sup> century libraries have therefore been transformed from traditional status of store house of information materials (mostly print) into information centres where Information and Communication Technologies (ICTs) are used to acquire, process, store, retrieve and disseminate information. The emphasis on print resources or total dependence on them is no longer reasonable. This is because, apart from cost, delay, bulkiness etc that characterise print resources, print has a deficiency of assuming that everyone learns at the same pace and in the same manner and is therefore not sufficient in today's high- tech. multi-sensory approach to learning (Watson, 2005). Digital technology has therefore become a major resource used by librarians to enhance effective services delivery. Also it has a good number of advantages over the traditional library system which include: No physical boundary, Round the clock availability, Multiple accesses (a number of users can access the same material at the same time) and Preservation and conservation (can be reproduced several times without wear and

tear). Other advantages are: Space saving, Networking ability, Cost saving and very friendly user search and retrieval interface (LISwiki, 2010).

Electronic resources, according to AACR2, are “materials consisting of data and/or computer program(s) encoded for reading and manipulation by a computer by the use of a peripheral device directly connected to the computer or remotely via a network such as the Internet” (as cited by Reitz, 2005, p. 244). They are electronic sources that are made available electronically and can also be accessed as such (electronically) through such facilities like online computer catalogs, the Internet and World Wide Web, digital libraries and archives, government portals and websites, CD-ROM databases, online academic databases such as Medline Online, or commercial databases such as LEXIS and NEXIS all of which are computer networked facilities (Ekwelem, Okafor & Ukwoma, 2009). International Records Management Trust (2009, p, 5) define an electronic record as they call it as any

component of information created electronically that forms part of an electronic record and that is usually stored separately within the digital file making up the electronic record as a whole. Every electronic record consists of at least one digital object, component or element, such as the bits of data that come together to create a word processed document. And some electronic records, such as photographs, video clips or web pages, may contain many different objects or elements

Digital library according to Waters, In Gary (1998 p1) are:

organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities.

In a simple term, “it is an organized collection of digitized material or its holding in the digital form, which can be accessible by a computer on the network by using TCP/IP or other protocol” (LIS wiki, 2010, p1). The digital library can therefore function effectively if the

resources such as human and material are made available. They include: digitized (print) materials, E-journals, E-books, v-books, maps, images, sounds, videos and multimedia, LAN, WAN etc. Human resources are made up of well trained manpower for online help. Researchers studying digital library, electronic resources, Information and Communication Technology (ICT) will find theories and models relating to these areas useful to their study to strengthen the basis of their researches.

Theories are therefore a set of ideas that are properly presented or argued out with the intention to explain facts or events. A model, similar to a theory is a simple description of a system used for explaining how something works or calculating what might happen (Hornby, 2005).

They provide a foundational basis on which research work is strengthened. To see far away, a researcher is expected to stand on the shoulders of another (existing knowledge). Theories therefore provide the basis. This work intends to state the body and significance/application of the theories that relate to digital and electronic libraries as well as the digital skills required in operating in the digital environment.

### **Connectivity Theory (Connectivism)**

Connectivity theory was propounded by George Siemens, a Canadian theorist in December, 2004 (Wikipedia, 2011). Known popularly as a learning theory of the digital age, it took its root from the psychological learning theories of behaviourism, cognitivism and constructivism. The connectivism theory states that,

Learning is a process that occurs within nebulous environments of shifting core elements – not entirely under the control of the individual. Learning (defined as actionable knowledge) which can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the

connections that enable us to learn more are more important than our current state of knowing (Siemens, 2005, p1).

Connectivity theory is based on the following principles:

- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Nurturing and maintaining connections is needed to facilitate continuous learning.
- Learning and knowledge rest in diversity of opinions.
- Capacity to know more is more critical than what is currently known.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making itself is a learning process (Siemens, 2005, p1).

The theory is an alternative to behaviourism, cognitivism and constructivism which are learning theories which were being used in creating instructional environments when technology was not part of learning. They consider learning principally as occurring inside a person and failed to recognize learning that is stored and manipulated by technology (Siemens, 2005).

**Significance/application:** The application of this theory is in two folds: first the use and manipulation of ICT resources. That is display of the knowledge of ICT skills. The second is how these skills and competencies will benefit the academic environment where the library staff serves. It will help them connect to a diversity of ideas; explore capacity to know more, etc as seen in the last five principles of connectivism. Creating, preserving and utilizing information is the basic thrust of librarianship. The theory assists the academic library staff to ensure that

knowledge that resides in a database is connected with the right people in the right context in order to promote learning in academic institutions.

### **Self-Efficacy Theory**

Self-efficacy theory is a psychological theory that originated from Albert Bandura, a Canadian Psychologist in 1977 (Apalachian State University, (2005), Wikipedia, 2011). It is a theory of how an individual demonstrates his or her ability to perform a particular job or task. It is a person's judgement of his or her capabilities based on mastery criteria and assessment of their abilities to perform specific tasks in relation to goals and standards rather than in comparison with others' capabilities (Wikipedia, 2010). Sote and Aramide (2010) refer to self-efficacy as an individual's belief in his or her ability to successfully perform a specific task. Citing Marakas, Johnson and Clay (2007), Sote and Aramide (2010) propose that, computer self efficacy has two levels – general computing and specific computer tasks or application level. While general computing refer to an individual's belief to perform computer tasks across multiple computer domains, specific task or application level refers to an individual's perception of efficacy to perform computer related tasks within a domain like word processing, use of Internet etc. ICT skills' training is found to increase self efficacy which in turn influences ICT acceptance. ICT self-efficacy focuses on what an individual believes he or she can accomplish with ICT resources.

**Significance/application:** The understanding of the theory will assist the academic library management to know what type of training method to recommend to which category of staff at any particular time. Staff with weak self efficacy belief (those with little or no confidence in the ability to use ICT resources, uncomfortable with their computer skills or uncomfortable using



ICT resources) may be exposed to the resources practically and at a remedial level. Those with high efficacy level may be exposed to higher or more advanced tasks and training modules.

### Wormell Model

This model was initiated and used by Wormell in 1998 to enhance the development of information system. It can be used to enhance the training and development efforts of staff at the library (Sewdass, 2003). The model has four components of user, developer, builder and architect which represent the different levels of interaction between different skills.

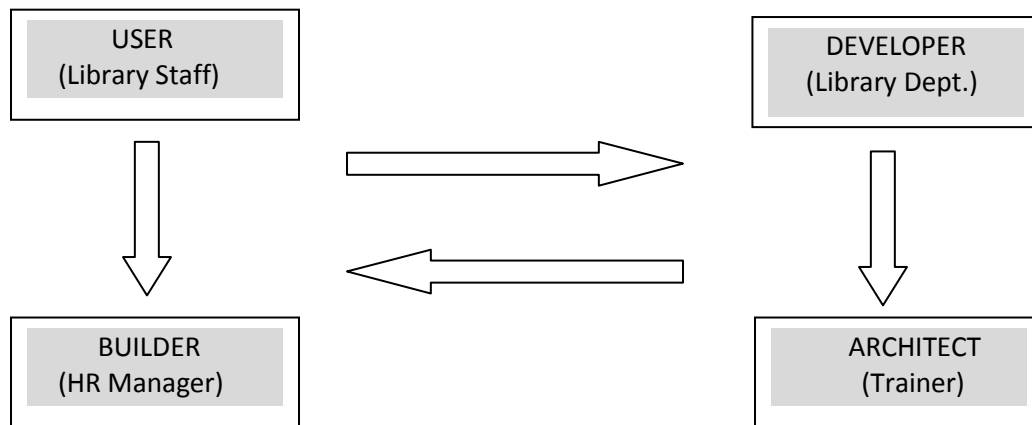


Figure 1: Wormell Model (Sewdass, 2003).

The user represents academic library staff; developer stands for library department (Sponsor of staff training and development programme; the architect symbolizes trainer or human resources managers who design training programmes appropriate for every personnel level according to training needs while builder denotes the trained (Sewdass, 2003).

**Significance/application:** Library managers will use the model to identify staff training needs, choose appropriate training programmes or method for them and select the best places to send staff for training.

### **Technology Acceptance Model (TAM)**

The technology acceptance model (TAM) was developed by Davis (1989) to explain computer-usage behavior. It models how users accept and use new technology. The model suggests that when library and users are presented with a new technology, a number of factors influence their decision about how and when they will use it. Such factors include:

Perceived usefulness (PU) - This was defined by Davis (1989) as the degree to which a person believes that using a particular system or structure would enhance his or her job performance.

Perceived ease-of-use (PEOU) - Davis defined this as the degree to which a person believes that using a particular system would be free from effort (Davis 1989).

In the context of information technologies, TAM suggests that users formulate a positive attitude toward a particular technology when they perceived that the technology is useful and easy to use (Davis 1989).

**Significance/application:** This model reveals the factors that influence one's attitudes towards acceptability or otherwise of a particular technology to include: perceived usefulness and perceived ease-of-use. As such, lends itself to all studies in library and information science and even beyond the field of librarianship that concerns "Electronic Resources and Digital Library Skills. The understanding of information professionals of the benefit of using e-resources and digital technology and how user- friendly they are will make them develop interest in it and subsequently through constant usage turn to use them without efforts.

### **Theory of Reasoned Action (TRA)**

Developed by Icek Ajzen and Martin Fishbein in 1975, Theory of Reasoned Action (TRA) was based on information integration theory. In this theory, a person's attitudes towards a behaviour consist of: a believe that, that particularly behavior leads to a certain outcome; and an

evaluation of the outcome of that behaviour. If the outcome seems beneficial to the individual, he or she may then intend to or actually participate in a particular behaviour. Personal attitudes are composed of an evaluation and the strength of belief, while societal norms include the components of normative beliefs and the motivation to comply with that belief. It is good in stimulating thought about ICT beliefs and their relationship to technology adoption and use.

**Significance/application:** The theory (TRA) gains greater relevance and application to person or organizations considering the adoption of a particular kind of innovation like, software. Each interaction with ICT creates a certain level of user satisfaction and consequently acceptance. Increased satisfaction leads to repeated use of the ICT, which in turn, increases the user satisfaction level.

### **Conclusion**

Five theories and models have altogether been considered in this article. They include connectivity theory, self-efficacy theory, Wormell model, Technology Acceptance Model (TAM) and Theory of Reasoned Action (TRA). In each case, the person that propounded or put forward the theory was mentioned with the year it was put forward. The theory is explained and its significance/application to electronic resources and or digital environment was considered with the view of exposing prospective researchers to a body of knowledge that will be referred to, in order to enrich their work.

### **Recommendations**

This work recommends in line with the provisions and relevance of the theories as follows:

1. Connectivity theory assists the academic library staff to ensure that knowledge that resides in a database is connected with the right people in the right context in order to

promote learning in academic institutions. It is therefore recommended that, management of academic libraries subscribe to databases that are relevant to the academic and faculty needs so that the members of these faculties (both staff and students) utilize this knowledge that resides in connected networks and remote locations. Staff training on emerging technologies should also be made a serious priority so that the staff will assist users in locating information that resides in connected networks.

2. Self-efficacy has to do with a person's self confidence in his or her ability to perform a particular task. It is positively related to performance as a person of high self efficacy is likely to perform jobs assigned to him better than a person of weak self-efficacy. It is therefore recommended that, staff training in ICTs and emerging technologies be made a priority in academic libraries in the state and elsewhere. This will increase staff self-efficacy in handling assignments in an electronic and digital environment.
3. Wormell model shows the level of collaboration that should exist between the different players in the academic library equation. It is therefore recommended that, all the key players i.e. library staff (user), management (sponsor of training programmes), programme designers (architect) and the trained come together to develop programmes that will improve digital library skills and proficiency in the use of electronic resources.
4. Since people are likely to accept easily, such technologies would easily enhance his or her job performance and would be free from effort as indicated by technology acceptance model, it is recommended that, staff be educated on potentials of new technologies to improve job performance before introducing them. Training modules should be highly simplifies and practical training emphasised above theory so that the staff will get used to doing it with less efforts.

5. Since an individual's action is dependent on the perceived outcome of the action, it is recommended that, a form of reinforcement be attached to the acquisition of and practical display of digital technology skills.

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