The Journal of Academic Librarianship 46 (2020) 102097

Contents lists available at ScienceDirect

The Journal of Academic Librarianship

journal homepage: www.elsevier.com/locate/jacalib

Perception of task-technology fit of digital library among undergraduates in selected universities in Nigeria

Funmilola O. Omotayo*, AbdulRasaq Haliru

Africa Regional Centre for Information Science, University of Ibadan, Nigeria

ARTICLE INFO

Keywords:
Digital library
Task characteristics
Technology characteristics
Task-technology fit
Undergraduates in Nigeria

ABSTRACT

Digital library has the capabilities of storing various electronic information resources which can conveniently be accessed by remote end-users via computer networks and the Internet. In recent times, Universities in Nigeria have embarked on integration of technologies in their operations for improvement, especially with respect to digitisation of academic information resources. However, with the huge investment committed to establishment of digital libraries in Nigerian Universities, less research has been done on their acceptance and usage from the users' perspective, more especially with respect to the fit of digital library with students' tasks. This study, therefore, investigated task-technology fit of digital libraries in three Nigerian Universities and identified factors influencing use of digital library by the students. Survey design guided the study and a questionnaire was used to collect data from 402 students. The study found a high usage of digital library among the students. A moderate positive correlation and significant relationship was found between the independent variables (task characteristics, technology characteristics, attitude, computer self-efficacy and task-technology fit) and use of digital library. The study validates the TTF model which posits that for an information system to be utilised, it must be a good fit for the tasks it supports.

Introduction

Digital library (DL) is of increasing significance in recent years, becoming a platform for easy access to electronic resources for a wide community of users. In recent times, Nigerian universities have embarked on integration of technologies in their operations for improvement and development, especially in the aspect of digitisation, dissemination and preservation of academic information resources. The universities libraries are fully involved in this development as they are the heart of the universities where intellectual contents of the institutions are housed. Also as part of mandatory requirements of the Nigeria National Universities Commission, various university libraries in Nigeria have complied and subscribed to DL initiative as a way of complementing and providing access to unlimited data and information resources; hence, DL is a gateway to access electronic resources in many Nigerian universities.

While an enormous amount of resources is spent in building DLs, increasing user access is essential to justify the resources invested. However, with the huge investment committed to establishment of DLs in Nigerian universities, review of literature reveal that less research has been done on its acceptance and use by students in Nigerian universities. There is need for research to know about patronage of these libraries and be able to conclude if the resources committed are justifiable. It is also important to determine if students are really familiar with DL services, whether students are making effective use of the libraries, and whether the technology provides a good fit with students' tasks. This study was, therefore, conceived to investigate usage of DL among undergraduates in some selected Nigerian universities and also determine the fit of the technology with the students' tasks. The study also identified the factors that influence use of DLs by the students.

Literature review

Review of literature on acceptance and use of various DLs found differing level of awareness, perception, acceptance and use by various respondents. Literature review also reveals that different user groups have differing expectations in the use of DL services. Various motivations and factors influencing use and non-use of DLs were also identified from literature. While some studies were able to identify the factors influencing use of DLs, some did not. A study by Xia (2003) examined different perceptions and expectations of digital services between users and librarians at Victoria University of Wellington in New Zealand. The study found that one of the factors that motivated the users to use digital services is that it is more economical to use online resources than

* Corresponding author.
E-mail address: lolaogunesan@yahoo.com (F.O. Omotayo).

https://doi.org/10.1016/j.acalib.2019.102097
Received 15 August 2019; Received in revised form 12 November 2019; Accepted 12 November 2019
Available online 20 November 2019
0099-1333/

to buy hardcopy materials, while accessibility was also identified as another motivation. A study by Melgoza, Mennel, and Gyeszly (2002) shows that, for scholarly research or serious curriculum needs, the use of printed materials was popular among faculty and graduate students of the Departments of Economics, Political Science, and the George Bush School of Government and Public Service at Texas A&M University; while the upper-level undergraduates primarily preferred to use Internet services. In addition, the respondents, whether faculty or students, ranked accessibility as the most crucial factor influencing use of the DL, followed by convenience and ease of use.

Another study by Arif and Kanwal (2009) investigated the acceptance and importance of DL among female students at International Islamic University, Islamabad, Pakistan. The study also highlighted the problems female students confronted in completing their research work because of limited access to DL in the university. Data was collected from 315 female students. Findings reveal that the students were unable to meet their information needs as DL access was limited and the quality and quantity of their research were affected due to the restriction of digital resources. Lack of information literary programs, Information Technology (IT) training workshops, availability of IT literate staff and electricity failure were identified as the main barriers to having access to DL, and also admitted that DL accessibility was indispensable to the completion of their research studies. Park, Roman, Lee, and Chung (2009) studied users' acceptance and use of DL system in 16 institutions in Africa, Asia, and Central/Latin America. The study examined the factors that influenced people's adoption and use of a DL system and tested the applicability of the Technology Acceptance Model (TAM) in the context of developing countries. The study also identified similarities and differences in the significance predictors of the DL acceptance across countries and continents. Data was collected from 1082 respondents. The path analysis results reveal that perceived ease of use of the library system had a significant impact on perceived usefulness which led to behavioural intention to use it. Hence, perceived ease of use and perceived usefulness were identified as factors that could influence use of DL by the study. The study concludes that some other factors that affect perceived ease of use and usefulness of DL need to be considered in the process of designing, implementing and operating DL systems. This could help decrease the mismatch between system design and users' realities, and further facilitate the successful adoption of DL systems in developing countries.

Sheeja (2010) examined the perceptions of undergraduate students towards the DL of the Cochin University of Science and Technology (CUSAT), India, with a view to determine the sources consulted and the general pattern of information gathering by the students. The study adopted a descriptive survey design and data was collected using a questionnaire administered to 225 respondents randomly selected from seven branches of engineering faculty in the CUSAT. Findings reveal that almost all students used the DL for learning. They frequently accessed the DL for getting previous examination question papers, syllabi and other materials pertaining to their studies, and were satisfied with the DL features and functionalities available. The students recommended the addition of more documents related to their courses and useful links to the DL so the technology could provide the best fit with their tasks. Liu and Luo (2011) conducted a comparative study of the extent to which undergraduate and graduate students in China differ in their use of DL. The undergraduate and graduate students had positive attitudes about use of DL, but undergraduates were unfamiliar with DL use. The study shows that the use of DL was influenced by a combination of various factors; remote access and faster access identified as important factors. Unlike the factors promoting use of DL, non-use factors (perceived influences, and degree of satisfaction) were quite different between undergraduate and graduate students due to their differing tasks, emphases and expectations for information. The study concludes that the students would use DL services, if suppliers integrate system characteristics, navigation features, natural language capacity into the system, as well as make available detailed tutorials and more full text options to support the students' tasks.

A study by Matusiak (2012) provides an overview of a case study research that investigated the use of DL resources in two undergraduate classes and also explored faculty and students' perceptions of educational DLs. The study found that students and faculty used the academic DL primarily for textual resources, but turned to the open web for visual and multimedia resources because they did not perceive academic libraries as a useful source of digital images. They rather preferred using search engines when searching for visual resources. The study also found limited use of DL resources for teaching and learning by the respondents because they perceived library system as not user-friendly and as a place which contain only primarily textual resources. This perception had a negative effect on user intention to use DL and thus discouraged them from trying to use the DL provided by the institution, especially for searching visual resources. The study was, however, able to establish that user perceptions of usefulness and usability, especially perceived ease of use, play an important role in user intentions to adopt and use digital collections for academic learning and teaching.

Bagudu and Sadiq (2013) examined the perception of students towards the DL services in the International Islamic University, Malaysia. The results of the study reveal a high level of awareness of DL services among the students. The students also showed positive attitude towards use of the DL services even though the level of usage was low. The study was able to reveal awareness of DL among the students, but did not consider the factors that influenced use by the students. In addition, Turan and Bayram (2013) studied the views and habituations of university students in regard to use of DL by three selected faculties in Ankara University, Turkey. The study explored the purpose of use, usage frequency and use tools for DL among the students. Findings show that, whereas the students used Internet resources, DL was not yet placed as their first priority because they were not yet aware of how to use the university DL. Hence, the students found their own resources sufficient for their researches. This study also did not consider the factors that influence use among the students. A study in Nigeria by Nwabueze and Urhiewhu (2015) on availability and use of digital information resources by undergraduates of universities in Delta and Edo states, Nigeria found that digital information resources were available at the university libraries. However, usage of these resources was low. Some constraints encountered by students towards accessibility of digital information resources in the libraries are epileptic power supply, none availability of online databases, lack of formal training in Internet skills for students, slow bandwidth, network problems and server slowness. The study, however, did not identify factors that influence use of these digital information resources.

Review of literature also shows that studies have adopted various theories or models to investigate factors that influence use of DLs in various settings and across diverse populations. Hong, Thong, Wong, and Tam (2002) noted that previous studies on DL adoption using the TAM have generated mixed results. Hence, they included some external variables such as individual differences (computer self-efficacy and knowledge of search domain) and system characteristics (relevance, terminology, and screen design) to study extensively intention to use various DLs. The results strongly support the utilisation of TAM in predicting users' intention to adopt DL, and demonstrate the effects of critical external variables on behaviour intention through perceived ease of use and perceived usefulness. All of the individual differences and system characteristics had significant effects on perceived ease of use of the DLs, in addition to relevance which had the strongest effect on perceived usefulness of the DLs. The study recommends further investigation in other countries to confirm if their findings would have generalisability. In a study of over 2000 students, Thong, Hong, and Tam (2004) presented a model of DL user acceptance in Hong Kong, which is also based on TAM. The premise of the model is that user acceptance of a DL is determined by users' perceptions of the system's usability. The study also identified three important predictors of increased usability of DLs which are interface or technology

characteristics (terminology clarity, screen design, and navigation clarity), organisational context (relevance, system accessibility, and system visibility), and individual differences (domain knowledge and computer experience). Hassan and Ali (2014) integrated the constructs in the TAM (perceived ease of use and perceived usefulness) to investigate the impact of interface characteristics (terminology and screen design) on the perceived ease of use and perceived usefulness of DL among postgraduate students in Somalia. The study found out that terminology used on DL interface had a positive influence on its perceived ease of use. Also, screen design had much impact on the perceived ease of using DL. A positive correlation between perceived ease of use and perceived usefulness was also found.

These studies have demonstrated how TAM variables as well as some other factors influence acceptance and use of DLs. These studies have also shown how different populations use various DLs, their perceptions, acceptance, satisfaction and factors influencing use in different contexts. It is however, noted that few of these studies have investigated use of DL by considering the fitness of the technology (DL) with the tasks of users. It should, however, be noted that user perceptions differ in regard to specific DL system and type of digital resources, as Bawden and Vilar (2006) have noted that user expectations of DL differ between different user groups and tasks to be performed. Hence, study of users' adoption and use of DL, as well as factors that influence use, becomes imperative in order to advice stakeholders on the need to provide DL services that will ensure a good fit with users' tasks, thereby helping to achieve the purpose of utilisation. Unlike previous studies, this study attempts to provide information with regards to usability of DLs among undergraduates of selected Nigerian universities, the tasks DLs are used to perform, frequency of use of DLs, as well as the fitness of the technology with the students' tasks.

Theoretical framework

Various theories have alluded to the influence of behavioural factors on use of various technologies. Prominent among these models are the Theory of Reasoned Action (TRA), (Fishbein & Ajzen, 1975), the Theory of Planned Behavior (TPB) (Ajzen, 1991), the Technology Acceptance Model (TAM) (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989), the Diffusion of Innovation Theory (DOI) (Rogers, 2003), computer self-efficacy (CSE) theory (Compeau & Higgins, 1995), the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003), among others. These models have been used by authors to investigate the use of technologies across various settings and countries. However, these models, as well as the combined models, fail to explicitly include task constructs. It has been argued that users would use an information technology if it meets their task requirements.

A model that explicitly includes task characteristics is the task-technology fit (TTF) model. This model has been shown to add explanatory power to the Technology Acceptance Model (Dishaw & Strong, 1999) as it provides a precise exploration of a link between work-related matters and technology use. The TTF model was developed by Goodhue and Thompson (1995) as an established theoretical framework in information systems research that enables the investigation of issues of fit of technology to tasks, as well as performance. Thus, the model depicts a balanced expression of task related aspects and technology support. The model provides for the capability of individuals to assess and explain information systems' success and impact on individual performance. The model posits that performance impacts will occur when technology meets the users' needs and provides features that support the fit of the requirements of the task. This means that if technology provides features that are useful to an end user, then it will have a positive impact on their performances (Cane & McCarthy, 2009).

The capability of the technology to support a task is represented by the construct “TTF” in the model, which refers to the matching of the capabilities of the technology to the demands of the task; that is, the ability of a technology to support a task. The model theorises that the fit between task requirements and technology functionality influence technology utilisation and work performance. A technology would be used well if the functions of the technology can support the needs of users (Dishaw & Strong, 1999; Goodhue, 1998). Hence, a technology would only be used if the system's functionalities provide corresponding support (fit) to the tasks/activities of the user. Essentially, this concept is an expression of the phrase ‘fitness for the purpose intended’ which often, describes a warranty or guarantee, for instance, in business or commercial activities (Hollingsworth, 2015). This study, therefore, adapted the TTF model to investigate the fit between undergraduates' tasks and DL because the model can be used to evaluate DL utilisation, explained from the perspective of task. It is assumed that the undergraduates would be more favorably disposed to using DL if it helps them accomplish their tasks with minimal effort, maximum efficiency and effectiveness. The TTF model has four key constructs: task characteristics, technology characteristics, which together affect the third construct TTF, which in turn affects the outcome variable, either performance or utilisation. The TTF mediates the relationship between task characteristics and technology characteristics and utilisation leading to performance impacts. Fig. 1 shows the TTF model developed by Goodhue and Thompson (1995).

Task characteristics are measured to examine non-routineness and interdependence of activities that turn inputs into outputs. Goodhue and Thompson (1995) explain that task characteristics are certain features that are attributed to every particular item of work which can be alternatively called a work package. They are those actions that a user might use information technology to perform. Technology includes the tools that are used to complete and assist with tasks. Technology characteristics, therefore, refer to the underlying features of an information system. They are the attributes of the technology which users

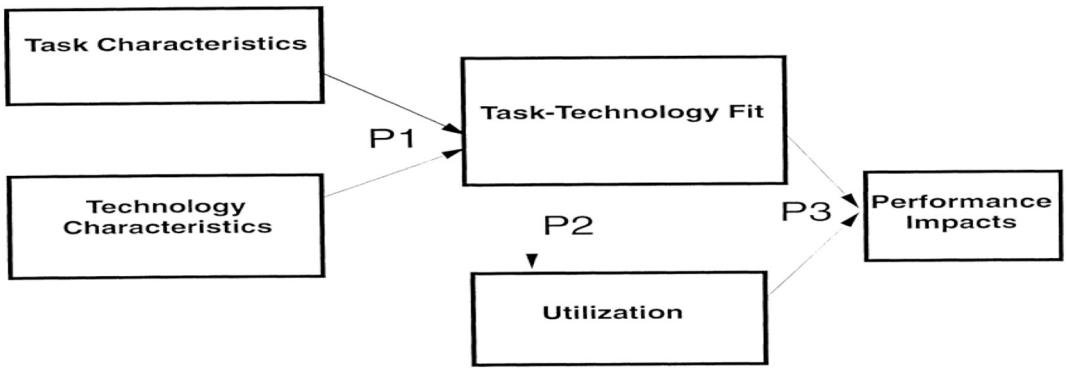

Fig. 1. The TTF model.
Source: Goodhue & Thompson, 1995, p. 220.

use when carrying out particular tasks, which include hardware, software and support services. If the technology provides features corresponding to the task, then it is presumed to have impact on its performance (Goodhue & Thompson, 1995). Task-technology fit is the "degree to which a technology assists an individual in performing his or her portfolio of tasks" (Goodhue & Thompson, 1995, p. 216). Most specifically, TTF is the correspondence between task requirements, individual abilities, and the functionality of the technology. Performance impact refers to the degree to which a user evaluates an information system against a task. It is a measure where by a user assesses his or her performances when utilising a technology to complete a task. Utilisation represents the action of the individual using the technology to complete his or her tasks.

There is a significant research supporting TTF and its application with technology acceptance. Hence, through the integration of the TTF variables with supporting success constructs, a comprehensive fit model may be created for use of DL among the undergraduates as previous studies have established. For instance, Goodhue (1995) confirms the relevance of the TTF model to assess the value of an information system. D'Ambra, Wilson, and Akter (2013); Dishaw and Strong (1998); and Goodhue, Klein, and March (2000) confirm the relevance of TTF to assess and predict system usage, as well as individual performance. Staples and Seddon (2004) also confirm that the TTF model can explain IT use in both mandatory and voluntary use settings, as is applicable in academic DL use where usage could be voluntary or mandatory. Different aspects of TTF have also been confirmed relevant for IT use in general (Ferratt & Vlahos, 1998; Goodhue, 1998), as well as for specific IT (Dishaw & Strong, 1999; Goodhue et al., 2000), and for a variety of tasks (Dishaw & Strong, 1998, 1999; Ferrat & Vlahos 1998; Goodhue et al., 2000). The TTF model has also been widely used to explain variant IT usage in organisational context, such as group support systems (Zigurs & Buckland, 1998; Zigurs, Buckland, Connolly, & Wilson, 1999), and systems for managerial decision making (Dishaw & Strong, 1999; Goodhue, 1995; Goodhue, 1998; Goodhue & Thompson, 1995; Staples & Seddon, 2004). Some researchers have extended the model to examine behaviours on the Internet (Klopping & McKinney, 2004), for blogging (Shang, Chen, & Chen, 2007), use of mobile devices for performing tasks (Hollingsworth, 2015), adoption of e-books by academics (D'Ambra et al., 2013), among others. These systems, however, are all used for specific tasks. DL is a general-purposed application that can be used by students to perform many academic tasks, hence the choice of the TTF model for this study.

Conceptual model

As DL becomes increasingly important in the academic community, a comprehensive understanding of how students use it to perform tasks may help provide information about the fit of the technology with their activities and hence, performance. This research seeks to understand students' use of DL and the matching fit between types of task and usage. The research model is, therefore, adopted from the TTF model, modified and designed to leverage technology fit for DL use. Three independent variables (task characteristics, technology characteristics, individual characteristics) and a dependent variable (use of DL) are proposed. The conceptual model, as presented in Fig. 2, shows the relationship between the variables. The conceptual model hypothesised that use of DL among university students can be influenced by the nature of work to be done (Task characteristics), the attributes of the technology (Technology characteristics), individual characteristics of the students (attitude and computer self-efficacy), as well as the degree to which DL assists the students in performing tasks (task-technology fit).

Task characteristics

Task characteristics represent the requirements of the specific task that the students need to complete by using DL. They are features of the task that are attributed to item of work, or alternatively called work packages. For this study, students' tasks include assignments, tutorials, acquiring knowledge, project writing, preparation towards examinations, among others. It is assumed that the nature of tasks that the students engage in, would determine their usability of DL or not. Studies, such as D'Ambra et al. (2013), Dishaw and Strong (1999), Goodhue and Thompson (1995), and Koo, Wati, and Jung (2011) have found significant relationships between task characteristics and utilisation of technologies. This study adopted the variable, task characteristic, as a factor that could influence use of DL by the students, therefore, a hypothesis is proposed:

Hypothesis 1. Task characteristics have significant relationship with use of DL by university students in Nigeria.

Technology characteristics

Technology characteristics are the attributes of the tools which users use to carry out particular tasks. Technology characteristics are considered appropriate surrogates for system quality (Goodhue & Thompson, 1995). In this study, technology characteristics represent the features of DL that are used to perform tasks. Studies have found that technology characteristics can determine the usefulness of a system, the ease of learning, accuracy, flexibility and reliability of the system (DeLone & McLean, 1992); and that combining technology characteristics with task characteristics can help achieve the best fit of the system or technology for the specified activity. Studies, such as D'Ambra et al. (2013), Dishaw and Strong (1999), Goodhue and Thompson (1995), Hollingsworth (2015), and Koo et al. (2011) have found significant relationships between technology characteristics and utilisation of technologies. The second hypothesis is therefore proposed:

Hypothesis 2. Technology characteristics have significant relationship with use of DL by university students in Nigeria.

Individual characteristics

Individual characteristics are the characteristics of the undergraduates that may affect or influence use of DL. Such characteristics include demographics, attitude, personality traits, and computer self-efficacy. Studies have shown that a good understanding of individual characteristics with regard to technology acceptance could help predict technology use more effectively and responsively. Variables considered as individual characteristics in this study are attitude and computer self-efficacy.

(i) Attitude

Attitude is "an individual's positive or negative feelings about performing a behaviour" (Fishbein & Ajzen, 1975, p. 216). It is determined through an assessment of one's beliefs regarding the consequences arising from a behaviour and an evaluation of the desirability of these consequences. Attitude has been found to influence perception and hence, rate of adoption and extent of utilisation of technology. Generally, technology that an individual has a positive attitude towards is more likely to be utilised by the individual than the one he/she is not favorably disposed to use. Attitude/behaviour models assume that users' beliefs and attitudes toward a particular technology largely determine whether users exhibit the behaviour of using the technology. In this study, attitude is the students' positive or negative feelings about the use of DL to carry out their tasks. Many studies (Omotayo & Salami, 2018; Taylor & Todd, 1995; Teo & Men, 2008; Williams & Adesope, 2017; Zhang, Aikman, & Sun, 2008) have found relationships between attitude and use of various technologies. For instance, Teo and Men (2008) extended the TTF model with attitude as a construct, providing a

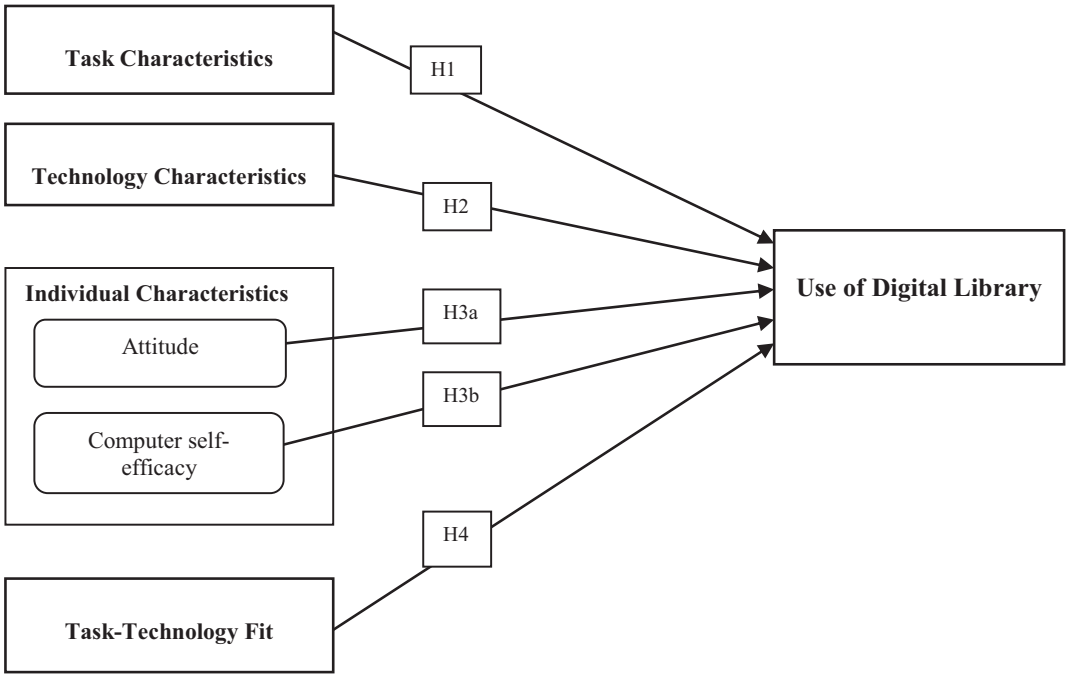

Fig. 2. Conceptual model.
(Adapted and modified from the TTF Model of Goodhue & Thompson, 1995.)

better explanation of users' choices of various technologies. Another hypothesis is thus proposed:

Hypothesis 3a. There is a significant relationship between attitude of university students in Nigeria and use of DL.

(ii) Computer self-efficacy (CSE)

Self-efficacy is the judgment of one's ability to use a technology (e.g. computer) to accomplish a particular job or task (Venkatesh et al., 2003, p. 432). It is one of the construct used in the social cognitive theory by Bandura (1986). Compeau and Higgins (1995), as well as Compeau, Higgins, and Huff (1999), have also applied and studied self-efficacy in the context of computer utilisation. Compeau and Higgins' (1995) model studied computer use but the nature of the model and the underlying theory allow it to be extended to acceptance and use of IT in general. Computer self-efficacy represents an individual's perceptions of his or her ability to use computer technology in the accomplishment of a task. CSE has been a popular and important construct in information system research. It is based in the broader construct of self-efficacy and a key concept in social cognitive theory that has been found relevant in many IT research settings. Just like self-efficacy, CSE reflects individuals beliefs in their abilities to organise and execute the courses of action needed to complete specific tasks successfully in given context, such as in tasks involving computers (Compeau et al., 1999). Consistent with self-efficacy research, findings from various organisational settings and research in information systems have found CSE to be significantly associated with wide range of cognitive, attitudinal, and behavioural outcomes. CSE has been found to be related to users' attitudes toward technology (Akpan, 2018; Compeau et al., 1999; Sam, Othman, & Nordin, 2005), intentions to use technology (Hasan, 2007; John, 2013; Klein, 2007), and actual technology use (Adekunjo & Unuabor, 2018; Ball & Levy, 2008; Sam et al., 2005; Schlebusch, 2018). Other studies such as Compeau et al. (1999), Karsten, Mitra, and Schmidt (2012) and Ramayah and Aafaqi (2004) have confirmed the influence of CSE on the acceptance and use of IT across a wide range of settings and technologies. For instance, Ramayah and Aafaqi (2004) found that CSE had direct significant impact on e-library usage by university students from four different schools in a Malaysian public university. Sam et al. (2005) found that undergraduates at a Malaysian university had high CSE and used the Internet extensively for educational purposes such as doing research, downloading electronic resources and e-mail communications. Therefore, another hypothesis is proposed:

Hypothesis 3b. There is a significant relationship between computer self-efficacy and use of DL by university students in Nigeria.

Task-technology fit

Task-technology fit is “the correspondence between task requirements, individual abilities and the functionality of technology” (Goodhue & Thompson, 1995, p. 218). More specifically in this study, TTF is the degree to which DL assists the students in the performance of their academic tasks. It can also be explained to mean the degree to which the universities DLs have desirable set of characteristics, features and applications to fit the students' tasks. Such features could be in terms of user-friendliness of the system, unambiguous terminology, availability of resources, clarity, screen design, navigation clarity, response time, recall, precision, etc. TTF has been developed as a diagnostic tool to determine whether information systems meet user needs, and has been demonstrated to have a positive impact on the effectiveness of various types of information systems, such as group support systems and management support systems (Gebauer & Ginsburg, 2006, 2009). Studies (e.g. Changchun, Haider, & Akram, 2017; D'Ambra et al., 2013; Goodhue & Thompson, 1995; McGill, Klobas, & Renzi, 2011; Nance & Straub, 1996; Vongjaturapat, 2018) have found that the impact of TTF on technology usage was significant. While Nance and Straub (1996) found that TTF influenced choices of whether or not to use technology, McGill et al. (2011) found that the better the fit of a learning management system to the skills of instructors and the tasks that the instructors must complete, the more the system will be used, and the more positive its effect on their performances. Vongjaturapat (2018) results of the structural model also supported the overall TTF model in reflecting significant positive impact of task and technology for smartphones in a DL setting and also confirmed a significant positive impact of TTF on the performances of the students of Burapha

Table 1
Cronbach alpha results for the scales.

Factors	Alpha levels	Number of items
Task characteristics	0.725	5
Technology characteristics	0.893	10
Attitude	0.684	10
Computer self-efficacy	0.830	6
Task-technology fit	0.826	11
Use of digital library	0.710	5

University, Sakaeo Campus, Thailand. It is assumed that universities DLs which have functionalities to assist the undergraduates with their tasks would be utilised by them and hence, another hypothesis is proposed:

H04. : Task-technology fit has a significant relationship with use of DL by university students.

Use of digital library

Utilisation focused studies predict that the utilisation of a technology is the result of a user's belief about and affect toward the technology. These literature have measured attitudes and behaviours as antecedents of utilisation and ultimate impact on performance, while fit focused literature assumes utilisation as a result of adequate TTF or the right task characteristics combining with the right technology characteristics (Goodhue & Thompson, 1995). Utilisation, in this model, is defined as the students' behaviour of employing DL in completing tasks. The terms use and utilisation are used synonymously to mean the use of digital technology in completing tasks by the university students. Actual utilisation has been found to result explicitly or implicitly in higher user performance (Goodhue & Thompson, 1995; Vongjaturapat, 2018). Several studies have investigated utilisation of various technologies and have confirmed that utilisation of technology could be influenced by many factors.

Methodology

The study adopted a descriptive survey. The location of study is three selected universities in Nigeria: University of Ilorin (UNILORIN) in Kwara State, Ladoke Akintola University of Technology (LAUTECH) in Oyo State and Bowen University (BU) in Osun State. The population of study comprised all undergraduates in the selected Universities. The three Universities were selected to cover the three categories of University in Nigeria (Federal, State and Private). UNILORIN is a federal government owned University; LAUTECH is a state owned University, while BU is a private owned University. This was done in order to be able to compare results among the three tiers of universities in Nigeria. The UNILORIN had 10,886 undergraduates as at 2017/2018 academic session; BU had 4133, while LAUTECH had 22,582. Thus, the total population of undergraduates at the three institutions was 37,601.

Multi-stage sampling technique was used to select the samples. Faculties that are common to the three selected universities were purposively selected in order to have uniformity of discipline or course of study across the universities. The faculties selected are Basic Medical Science, Sciences, as well as Social Science/Management Science. The total population of students at the selected faculties is 16,079 (4024 at UNILORIN, 8865 at LAUTECH and 3190 at BU). Furthermore, proportionate stratified random sampling was used to select 2.5% of the population from each of the faculties giving a sample size of 402.

Questionnaire was used for data collection because of its usefulness in gathering data from a large population of respondents in a relative short period. The questionnaire was carefully designed and questions from previous studies on TTF model (i.e. Goodhue, (1998), Goodhue & Thompson, 1995, Dishaw & Strong, 1999) were adopted and modified to suit this study. The questionnaire was structured into eight sections with a 4-point Likert scale ranging from Strongly Agree to Strongly Disagree. Cross-check questions were incorporated into the questionnaire items to ascertain discrepancies in the answers. The questionnaire was validated by two experts in the field of information science for content and construct validity. To determine the reliability of the instrument, a pilot study was conducted among undergraduates of the University of Ibadan, who are not part of the respondents used for the main study. The internal consistency and reliability was established as all modified items have Cronbach's alpha ranging from 0.710 to 0.893 which are above the accepted threshold of 0.7. The overall Cronbach alpha (α) is 0.899. The results of the test are presented in Table 1.

Copies of questionnaire were administered at the selected faculties in each of the universities. The data collection period lasted six weeks. Ethical procedures were followed during the design and administration of the instrument. Respondents were given the free will to participate in the study. Four hundred and two copies of questionnaire were distributed while 379 copies were properly completed and considered suitable for analysis, giving a 94.0% response rate.

Data analysis, presentation of results and discussion

Descriptive analysis

Table 2 presents the results of the frequency counts and percentages used for descriptive analysis. More males (57.2%) than females (42.8%) participated in the study with majority (62.9%) in the age bracket 16–20 years. Faculty of Science had more representation (40.0%) than the other two faculties. All the students were using DLs, while majority (60.2%) used on a weekly basis.

Update of knowledge, assignments and project writing are the main tasks the students used DLs to perform as shown in Table 3. The students rarely used DLs to prepare for examinations, as observed across the three institutions.

Table 4 shows the students' responses with regards to the fit of DLs with their tasks. The students agreed that the institutions' DLs provide a

Table 2
Characteristics of the respondents.

Characteristics	BOWEN		LAUTECH		UNILORIN		Overall total	
	Freq	%	Freq	%	Freq	%	Freq	%
Age								
16–20 years	68	68.0	120	59.4	65	65.0	253	62.9
21–30 years	32	32.0	75	37.1	31	31.0	138	34.3
31–35 years	0	0.0	5	2.5	4	4.0	9	2.2
Above 35 years	0	0.0	2	1.0	0	0.0	2	0.6
Gender								
Male	63	63.0	101	50.0	66	66.0	230	57.2
Female	37	37.0	101	50.0	34	34.0	172	42.8
Faculty								
Basic Med science	30	30.0	43	21.3	17	17.0	90	22.4
Sciences	40	40.0	69	34.2	52	52.0	161	40.0
Social/ Management Science	30	30.0	90	44.6	31	31.0	151	37.6
Use of digital library								
Yes	100	100.0	202	100.0	100	100.0	402	100.0
No	0	0	0	0	0	0		
Frequency of digital library usage								
Daily	28	28.0	68	33.7	10	10.0	106	26.4
Weekly	52	52.0	116	57.4	74	74.0	242	60.2
Fortnightly	11	11.0	8	4.0	16	16.0	35	8.7
Monthly	9	9.0	10	4.9	0	0	19	4.7

N = 100 (BOWEN); 202 (LAUTECH); 100 (UNILORIN).

Table 3
Tasks digital library are used to perform.

Tasks	BOWEN		LAUTECH		UNILORIN		Overall total	
	D	A	D	A	D	A	D	A
To update knowledge	1 (1.0%)	99 (99.0%)	18 (8.9%)	184 (91.1%)	5 (5.0%)	95 (95.0%)	24 (6.0%)	378 (94.0%)
To carry out assignments	17 (17.0%)	83 (83.0%)	55 (27.2%)	147 (72.8%)	22 (22.0%)	78 (78.0%)	94 (23.4%)	308 (76.6%)
To prepare for examinations	49 (49.0%)	51 (51.0%)	102 (50.5%)	100 (49.5%)	55 (55.0%)	45 (45.0%)	206 (51.2%)	196 (48.8%)
To source materials for project writing	6 (6.0%)	94 (94.0%)	19 (9.4%)	183 (90.6%)	33 (33.0%)	67 (67.0%)	58 (14.4%)	344 (85.6%)
To get information about current affairs	57 (57.0%)	43 (43.0%)	62 (30.7%)	140 (69.3%)	42 (42.0%)	58(58.0%)	161 (40.0%)	241 (60.0%)

fit with their various tasks which made them use the technology.

Test of hypotheses

The five hypotheses were tested using Spearman rank correlation. The hypotheses were tested in null form, posing the assumption that a significant relationship does not exist between the independent and dependent variables. The hypotheses in the alternative forms assume that significant relationships exist between the concerned variables. The level of significance was pre-set to 5%; if p obtained < 0.05, the null hypothesis was rejected, while the null hypothesis was not rejected if p obtained > 0.05. Tables 4 and 5 present the results of the test of hypotheses. Table 5 shows the results for the three institutions combined, while Table 6 shows the results for each of the institutions.

When results from the three institutions were combined, the results show moderate positive correlation and significant relationship between task characteristics and use of DL ($r = 0.528$, $p = 0.000$), technology characteristics and use of DL ($r = 0.537$, $p = 0.000$), attitude and use of DL ($r = 0.554$, $p = 0.003$), computer self-efficacy and use of DL ($r = 0.551$, $p = 0.003$), as well as task-technology fit and use of DL ($r = 0.542$, $p = 0.000$). Hence null hypotheses 1 to 4 are rejected. The results also show that for an increase in the values of task characteristic, technology characteristics, attitude, computer self-efficacy and TTF, there would be an increase in use of DL, which means that if these variables are promoted, there would be an increase in use of DL among the students. Task characteristics, Technology characteristics, Attitude, CSE and TTF have moderate positive correlation and significant relationship with use of DL at the each of the three institutions as shown in Table 6.

Discussion of findings

Findings reveal that the students used DLs to perform various academic tasks. The results also reveal a high level of awareness and utilisation among the students, hence it could be said that they had positive attitude towards use of DL services. The study also found that the students used the DLs at their institutions because the libraries' resources were useful to them. These findings provides support for the TTF model which posits a rational approach when deciding to accept new technologies, by suggesting that individuals choose to accept and use a new technology that provides benefits for them. When the institutions were combined and for each of the institutions, the results show significant relationships among the variables and use of DL. This shows that all the variables influenced use of DLs at the institutions.

The test of hypotheses reveals that task characteristics had moderate positive correlation and significant relationships with use of DLs at the institutions. These findings are consistent with findings of previous studies (e.g. D'Ambra et al., 2013; Dishaw & Strong, 1999; Vongjaturapat, 2018; Yen, Wu, Cheng, & Huang, 2010). The implication of this is that task characteristics of the students influenced their usage of DLs, hence the factor should be taken into consideration to encourage them use the technology more. The test of hypotheses also reveals that technology characteristics had moderate positive correlation and significant relationships with use of DLs at the institutions. This confirms the findings of D'Ambra et al. (2013), Dishaw and Strong (1999), Goodhue and Thompson (1995), Hollingsworth (2015), Koo

Table 4
Students' perceptions of fit of digital libraries and tasks.[a]

TTF	BOWEN		LAUTECH		UNILORIN		Overall total	
	D	A	D	A	D	A	D	A
Digital library has a good user interface which makes me use it for my tasks	15 (15.0%)	85 (85.0%)	50 (24.8%)	152 (75.2%)	32 (32.0%)	68 (68.0%)	97 (24.1%)	305 (75.9%)
Digital library is compatible and fit well with my tasks	31 (31.0%)	69 (69.0%)	36 (17.8%)	166 (82.2%)	12 (12.0%)	88 (88.0%)	79 (19.7%)	323 (80.3%)
Using digital library fit well with the way I like to work	27 (27.0%)	73 (73.0%)	20 (9.9%)	182 (90.1%)	20 (20.0%)	80 (80.0%)	67 (16.7%)	335 (83.3%)
Regular update on digital library makes me use it	32 (32.0%)	68 (68.0%)	8 (4.0%)	194 (96.0%)	28 (28.0%)	72 (72.0%)	68 (16.9%)	334 (83.1%)
My University digital library has sufficient and up-to-date resources which help me accomplish my tasks	28 (28.0%)	72 (72.0%)	12 (5.9%)	190 (94.1%)	15 (15.0%)	85 (85.0%)	55 (13.7%)	347 (86.3%)
I use digital library because it is always and readily available 24/7	30 (30.0%)	70 (70.0%)	40 (19.8%)	162 (80.2%)	38 (38.0%)	62 (62.0%)	108 (26.9%)	294 (73.1%)
I use digital library because it is capable of assisting me to do my daily tasks	13 (13.0%)	87 (87.0%)	23 (71.4%)	179 (88.6%)	21 (21.0%)	79 (79.0%)	57 (14.2%)	345 (85.8%)
Digital library does not supports me to search across full text (reverse coded)	86 (86.0%)	14 (14.0%)	190 (94.1%)	12 (5.9%)	91 (91.0%)	9 (9.0%)	367 (91.3%)	35 (8.7%)

[a] Multiple choice options.

Table 5
Relationship between independent variables (task characteristics, technology characteristics, attitude, computer self-efficacy and TTF) and dependent variable (digital library use).

				Use_of_Digital_Library
Spearman rho	Ho1	Task Characteristics	Correlation Coefficient	0.528**
			Sig. (2-tailed)	0.000
			N	378
	Ho2	Technology Characteristics	Correlation Coefficient	0.537**
			Sig. (2-tailed)	0.000
			N	378
	Ho3a	Attitude	Correlation Coefficient	0.554**
			Sig. (2-Tailed)	0.003
			N	377
	Ho3b	Computer self_efficacy	Correlation Coefficient	0.551**
			Sig. (2-Tailed)	0.003
			N	379
	Ho4	Task_Tech_Fit	Correlation Coefficient	0.542**
			Sig. (2-tailed)	0.000
			N	378

** Correlation is significant at the 0.01 level (2-tailed).

et al. (2011), McGill and Klobas (2009), and Staples and Seddon (2004). This implies that characteristics of DL, such as the functionality, adaptability and user-friendliness, availability, accessibility of data and information resources, ease of system use, reliability, as well as quality of data or information resources, are key enablers for its acceptance and use by the students. This is corroborated by the responses of the students where majority agreed that some features of DL (e.g. *good user interface, always and readily available 24/7, regular update, sufficient and up-to-date resources*) made them use the technology. This reflects the importance of technology characteristics on usage of technology as indicated by D'Ambra et al. (2013); Dishaw and Strong (1999). Technology characteristics can determine the usefulness and ease of use of a system, hence, combining technology characteristics with task characteristics can help achieve the best fit of system or technology with tasks or activities.

In addition, support was found for the relationship between attitude of the students towards technology and use of DL. Studies (e.g. Ajzen, 1985, 1991; Ajzen & Fishbein, 1980) have established that attitude accounts for an appreciable proportion of variance in behavioural intentions and actual behaviour when appropriately measured. These studies have equally established that attitudes guide behaviour and thus substantiated the predictive validity of attitude on behavioural intentions as well as actual behaviour. Studies of Dishaw and Strong (1999), Omotayo and Salami (2018), and Williams and Adesope (2017) have equally lent support to the fact that a user's belief and attitude toward a particular technology largely determine whether the user exhibit the behaviour of using the technology or not. In this study, the students had positive attitude towards their institutions' DLs which made them use them. Therefore, consistent with findings from literature, use of DL by students can be explained by considering their proximal attitude toward the technology.

Computer self-efficacy is another variable that has moderate positive correlation and significant relationship with use of DLs by the University students. Consistent with findings of previous research, CSE is significantly associated with wide range of cognitive, attitudinal, and behavioural outcomes such as users' attitudes toward technology (Akpan, 2018; Compeau et al., 1999), intentions to use technology (John, 2013; Klein, 2007), and actual technology use (Adekunjo & Unuabor, 2018; Schlebusch, 2018). Our results demonstrate that the students' skill and competence at using technology and the Internet influenced their use of DLs. Hence, students need to be encouraged to acquire computing skill in order to be relevant in modern day technology-driven world.

A moderate positive correlation and significant relationship was also found between the variable “TTF” and use of DL. TTF focuses on the ability of a technology to support a task and match task requirements with available functionality (Wu, Hsu, & Yeh, 2007). TTF is the degree to which the universities DLs have desirable set of characteristics, features and applications that fit the students' tasks. Hence, the capability of DLs to support the students' tasks influenced their usage. Several studies (e.g. Changchun et al., 2017; D'Ambra et al., 2013; Goodhue & Thompson, 1995; McGill et al., 2011; McGill & Klobas, 2009; Nance & Straub, 1996; Omotayo & Chigbundu, 2017; Raven, Leeds, & Park, 2010; Vongjaturapat, 2018) have equally established relationships between TTF and use of various technologies. The implication of this finding is that the design of DLs available at the universities made provisions for functionalities that help the students accomplish their various tasks.

Conclusion

Goodhue and Thompson's (1995) theory of TTF states that for an IS to have positive impact, it must be utilised and be a good fit for the tasks it supports. This study's version of Goodhue and Thompson's proposition is that, for the students to use DL, it must be a good fit for their tasks, thus, the results from this study support the proposition. The study concludes that DLs were highly used by the students at the three institutions. The study also concludes that task characteristics, technology characteristics, individual characteristics (attitude and computer self-efficacy), as well as TTF are factors that influenced use of DLs at the universities. These findings further corroborate the usefulness of the TTF model in predicting use of technology.

The study has been able to significantly contribute to the sparse literature on students' use of DL in Nigerian universities by providing information about the fitness of DL technology into the tasks of students. The study equally provides empirical data for further research on other factors (individual characteristics) influencing utilisation of DL among students. At present, this is one of the first studies that attempted to manipulate task, technology and user characteristics in a study of fit yielding results for practitioners and researchers. Specifically, researchers will gain additional insight into users' engagement with use of DL for accomplishment of tasks. For practitioners, this study has provided information about the types of tasks university students use DL to perform, which may assist institutions on the types of resources to be provided on DL platforms. The study would be helpful to university librarians to have an understanding of the usefulness of DL to students and factors that influence use in order to provide effective DL services that would meet the needs of students. The study also contributes immensely to the body of knowledge in the areas of ICT applications in library and information services. The study is limited because of the small geographical coverage to southwestern Nigeria. Future studies could consider covering other geographical zones.

Table 6
Relationship between independent variables (task characteristics, technology characteristics, attitude, computer self-efficacy and task technology fit) and dependent variable (digital library use) at each of the universities.

Institutions		Variables		Use of digital library
UNILORIN	Ho1	Task Characteristics	Correlation Coefficient	0.571
			Sig. (2-tailed)	0.000
			N	100
LAUTECH	Ho1	Task Characteristics	Correlation Coefficient	0.597
			Sig. (2-tailed)	0.000
			N	202
BOWEN	Ho1	Task Characteristics	Correlation Coefficient	0.561
			Sig. (2-tailed)	0.000
			N	76
UNILORIN	Ho2	Technology Characteristics	Correlation Coefficient	0.566
			Sig. (2-tailed)	0.000
			N	99
LAUTECH	Ho2	Technology Characteristics	Correlation Coefficient	0.548
			Sig. (2-tailed)	0.036
			N	202
BOWEN	Ho2	Technology Characteristics	Correlation Coefficient	0.480
			Sig. (2-tailed)	0.028
			N	77
UNILORIN	Ho3a	Attitude	Correlation Coefficient	0.578
			Sig. (2-tailed)	0.000
			N	100
LAUTECH	Ho3a	Attitude	Correlation Coefficient	0.578
			Sig. (2-tailed)	0.000
			N	200
BOWEN	Ho3a	Attitude	Correlation Coefficient	0.552
			Sig. (2-tailed)	0.002
			N	77
UNILORIN	Ho3b	Computer self_efficacy	Correlation Coefficient	0.543
			Sig. (2-tailed)	0.000
			N	100
LAUTECH	Ho3b	Computer self_efficacy	Correlation Coefficient	0.513
			Sig. (2-Tailed)	0.009
			N	202
BOWEN	Ho3b	Computer self_efficacy	Correlation Coefficient	0.554
			Sig. (2-Tailed)	0.040
			N	77
UNILORIN	Ho4	Task_Tech_Fit	Correlation Coefficient	0.524
			Sig. (2-Tailed)	0.000
			N	100
LAUTECH	Ho4	Task_Tech_Fit	Correlation Coefficient	0.548
			Sig. (2-Tailed)	0.035
			N	201
BOWEN	Ho4	Task_Tech_Fit	Correlation Coefficient	0.587
			Sig. (2-Tailed)	0.011
			N	77

References

Adekunjo, O. A., & Unuabor, S. O. (2018). Computer self-efficacy and attitudes toward internet usage among library and information science postgraduate students in two library schools in Nigeria. *American Journal of Educational Research and Reviews, 3*(24), 1–13.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl, & J. Beckman (Eds.). *Action control: From cognition to behavior* (pp. 11–39). Heidelberg, Germany: Springer.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* Englewood-Cliffs, NJ: Prentice-Hall.

Akpan, I. F. (2018). Computer anxiety, computer self-efficacy and attitude towards internet among secondary school students in Akwa Ibom state, Nigeria. *American Journal of Educational Research, 6*(11), 1455–1459.

Arif, M., & Kanwal, S. (2009). Acceptance of digital library among female students and effects of limited access of digital library on their performance in research work: A case of international Islamic University. *The International Information and Library Review, 41*, 122–128.

Bagudu, A. A., & Sadiq, H. (2013). Students' perceptions of digital library services: A case study of International Islamic University, Malaysia. *Library Philosophy and Practice (e-journal), 894*. Retrieved March 1, 2019 from http://digitalcommons.unl.edu/libphilprac/894.

Ball, D. M., & Levy, Y. (2008). Emerging educational technology: Assessing the factors that influence instructors' acceptance in information systems and other classroom. *Journal of Information Systems Education, 19*(4), 431–443.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Bawden, D., & Vilar, P. (2006). Digital libraries: To meet or manage user expectations. *ASLIB Proceedings, 58*(4), 346–354.

Cane, S., & McCarthy, R. (2009). Analyzing the factors that affect information systems use: A task-technology fit meta-analysis. *Journal of Computer Information Systems, 50*(1), 108–123.

Changchun, G., Haider, M. J., & Akram, T. (2017). Investigation of the effects of task technology fit, attitude and trust on intention to adopt mobile banking: Placing the mediating role of trialability. *International Business Research, 10*(4), 77–91.

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly, 19*(2), 189–211.

Compeau, D. R., Higgins, C. A., & Huff, S. (1999). Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly, 23*(2), 145–158.

D'Ambra, J., Wilson, C., & Akter, S. (2013). Application of the task-technology fit model to structure and evaluate the adoption of e-books by academics. *Journal of the American Society for Information Science and Technology, 64*(1), 48–64.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 982–1003.

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The Quest for the dependent variable. *Information Systems Research, 3*(1), 60–95.

Dishaw, M. T., & Strong, D. M. (1998). Supporting software maintenance with software engineering tools: A computed task-technology fit analysis. *The Journal of Systems and Software, 44*(2), 107–120.

Dishaw, M. T., & Strong, D. M. (1999). Extending the technology acceptance model with task-technology fit constructs. *Information and Management, 36*(1), 9–21.

Ferratt, T. W., & Vlahos, G. E. (1998). An investigation of task-technology fit for managers in Greece and the US. *European Journal of Information Systems, 7*, 123–136.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research.* Reading, MA: Addison-Wesley.

Gebauer, J., & Ginsburg, M. (2006). Exploring the black box of task-technology fit: The case of mobile information systems. *Fifth workshop on e-business (WeB 2006)* (pp. 1–14). .

Gebauer, J., & Ginsburg, M. (2009). Exploring the black box of task-technology fit. *Communications of the ACM, 52*(1), 130–135.

Goodhue, D. L. (1995). Understanding user evaluations of information systems. *Management Science, 41*(12), 1827–1844.

Goodhue, D. L. (1998). Development and measurement validity of a task-technology fit instrument for user evaluations of information systems. *Decision Sciences, 29*(1), 105–138.

Goodhue, D. L., Klein, B. D., & March, S. T. (2000). User evaluations of IS as surrogates for objective performance. *Information & Management, 38*(2), 87–101.

Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *MIS Quarterly, 19*(2), 213–236.

Hasan, B. (2007). Examining the effects of computer self-efficacy and system complexity on technology acceptance. *Information Resources Management Journal, 20*(3), 76–88.

Hassan, M. M., & Ali, A. Y. S. (2014). Impact of interface characteristics on the perceived ease of use and perceived usefulness of digital library adoption among post-graduate students in Somalia. *European Journal of Business and Management, 6*(35), 98–102.

Hollingsworth, C. L. (2015). *An examination of fit and the use of mobile devices for performing tasks.* Doctor of Business Administration Dissertations. Paper 5Kennesaw, GA: Coles College of Business, Kennesaw State University.

Hong, W., Thong, J. Y. L., Wong, W.-M., & Tam, K.-Y. (2002). Determinants of user acceptance of digital libraries: An empirical examination of individual differences and system characteristics. *Journal of Management of Information Systems, 18*(3), 97–124.

John, S. P. (2013). Influence of computer self-efficacy on information technology adoption. *International Journal of Information Technology, 19*(1), 1–13.

Karsten, R., Mitra, A., & Schmidt, D. (2012). Computer self-efficacy: A meta-analysis. *Journal of Organizational and End User Computing, 24*(4), 54–80.

Klein, R. (2007). An empirical examination of patient-physician portal acceptance. *European Journal of Information Systems, 16*(6), 751–760.

Klopping, I. M., & McKinney, E. (2004). Extending the technology acceptance model and the task-technology fit model to consumer e-commerce. *Information Technology, Learning, and Performance Journal, 22*(1), 35–48.

Koo, C., Wati, Y., & Jung, J. J. (2011). Examination of how social aspects moderate the

relationship between task characteristics and usage of social communication technologies (SCTs) in organizations. *International Journal of Information Management, 31*(5), 445–459. https://doi.org/10.1016/j.ijinfomgt.2011.01.003.
Liu, Z., & Luo, L. (2011). A comparative study of digital library use: Factors, perceived influences and satisfaction. *The Journal of Academic Librarianship, 37*(3), 230–236.
Matusiak, K. K. (2012). Perceptions of usability and usefulness in digital libraries. *International Journal of Humanities and Arts Computing, 6*(1–2), 133–147.
McGill, T. J., & Klobas, J. E. (2009). A task-technology fit view of learning management system impact. *Computers and Education, 52*(2), 496–508.
McGill, T. J., Klobas, J. E., & Renzi, S. (2011). LMS use and instructor performance: The role of task-technology fit. *International Journal on E-Learning, 10*(1), 43–62.
Melgoza, P., Mennel, P. A., & Gyeszly, S. D. (2002). Information overload. *Collection Building, 21*(1), 32–43.
Nance, W. D., & Straub, D. W. (1996). An investigation of task/technology fit and information technology choices in knowledge work. *Journal of Information Technology Management, 7*(3&4), 1–14.
Nwabueze, A. U., & Urhiewhu, L. O. (2015). Availability and use of digital information resources by undergraduates of University in Delta and Edo States, Nigeria. *International Journal of Digital Library Services, 5*(2), 1–12.
Omotayo, F. O., & Chigbundu, M. C. (2017). Use of information and communication technologies for administration and management of schools in Nigeria. *Journal of Systems and Information Technology, 19*(3/4), 183–201.
Omotayo, F. O., & Salami, M. O. (2018). Use of Social Media for Knowledge sharing among students. *Asian Journal of Information Science and Technology, 8*(2), 65–75.
Park, N., Roman, R., Lee, S., & Chung, J. E. (2009). User acceptance of a digital library system in developing countries: An application of the Technology Acceptance Model. *International Journal of Management, 29*(3), 196–209.
Ramayah, T., & Aafaqi, B. (2004). Role of self-efficacy in e-library usage among student of a public university in Malaysia. *Malaysia Journal of Library and Information Science, 9*(1), 39–57.
Raven, A., Leeds, E., & Park, C. W. (2010). Digital video presentation and student performance: A task-technology fit perspective. *International Journal of Information and Communication Technology Education, 6*(1), 17–29.
Rogers, E. M. (2003). *Diffusion of innovations.* New York: Free Press.
Sam, H. K., Othman, A. E. A., & Nordin, Z. S. (2005). Computer self-efficacy, computer anxiety, and attitudes toward the internet: A study among undergraduates in Unimas. *Educational Technology and Society, 8*(4), 205–219.
Schlebusch, C. L. (2018). Computer anxiety, computer self-efficacy and attitudes towards the internet of first year students at a South African University of Technology. *Africa Education Review, 15*(3), 72–90.
Shang, R. A., Chen, Y.-C., & Chen, C.-M. (2007). Why people blog? An empirical investigations of the task technology fit model. *11th Pacific-Asia Conference on Information Systems (PACIS 2007) Proceedings* (pp. 212–225). .
Sheeja, N. (2010). Undergraduate students' perceptions of digital library: A case study use in. *The International Information and Library Review, 42*(3), 149–153.
Staples, D. J., & Seddon, P. (2004). Testing the technology-to-performance chain model. *Journal of Organizational and End User Computing, 16*(4), 17–36.
Taylor, S., & Todd, P. (1995). Assessing IT usage: The role of prior experience. *MIS Quarterly, 19*(4), 561–570.
Teo, T. S. H., & Men, B. M. (2008). Knowledge portal in Chinese consulting firms: A task-technology fit perspective. *European Journal of Information System, 17*(6), 557–574.
Thong, J., Hong, W., & Tam, K. Y. (2004). What leads to user acceptance of digital libraries? *Communications of the ACM, 47*(11), 79–83.
Turan, F., & Bayram, O. (2013). Information access and digital library use in university students' education: The case of Ankara University. The 2nd International Conference on Integrated Information. *Procedia: Social and Behavioral Sciences, 73*, 736–743.
Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.
Vongjaturapat, S. (2018). Application of the task-technology fit model to structure and evaluation of the adoption of smartphones for online library systems. *Science and Technology Asia, 23*(1), 39–56.
Williams, C., & Adesope, R. Y. (2017). Undergraduates' attitude towards the use of social media for learning purposes. *World Journal of Education, 7*(6), 90–95.
Wu, W., Hsu, B., & Yeh, R. (2007). Fostering the determinant of knowledge transfer: A team-level analysis. *Journal of Information Science, 33*(3), 326–339.
Xia, W. (2003). Digital library services: Perceptions and expectations of user communities and librarians in a New Zealand academic library. *Australia Academic and Research, Libraries, 34*(1), 56–70.
Yen, D. C., Wu, C. S., Cheng, F. F., & Huang, Y. W. (2010). Determinants of user's intention to adopt wireless technology: An empirical study by integrating TTF with TAM. *Computers in Human Behavior, 26*, 906–915.
Zhang, P., Aikman, S. N., & Sun, H. (2008). Two types of attitudes in ICT acceptance and use. *International Journal of Human-Computer Interaction, 24*(7), 628–648.
Zigurs, I., & Buckland, B. K. (1998). A theory of task/technology fit and group support systems effectiveness. *MIS Quarterly, 22*(3), 313–334.
Zigurs, I., Buckland, B. K., Connolly, J., & Wilson, E. V. (1999). A test of task-technology fit theory for group support systems. *Data Base for Advances in Information Systems, 30*(3/4), 34–50.