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Technology acceptance among library male and female users of Lahore-based public and private general categories universities

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Technology acceptance among library male and female users of Lahore based public and private general categories universities

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Abstract

Purpose- The purpose of the study was to assess the usefulness of digital library resources & services, and the value of multidisciplinary databases among postgraduate researchers/ students. This research study is an investigation of technology acceptance behaviours of university library users in Lahore, Pakistan. It also works on user's perception and usage of digital databases, user's level of satisfaction, user's ease of use and usefulness to use digital library databases and identifications of factors affecting accessing digital databases. This research study is based on the TAM model in the context of technology acceptance by postgraduate researchers.

Design/ methodology/ approach-This is a quantitative research study based on the technology acceptance model (TAM) and two basic variables i.e. perceived ease of use (PEOU) and perceived usefulness (PU) adopted to check the acceptance level of library users through an adapted questionnaire-survey of 243 post-graduate students of higher degree-awarding universities/institutes of Pakistan, accredited from Higher Education Commission (HEC) of Pakistan.

Findings- The findings of this study discovered that the perceived usefulness and perceived ease of use of the system are significant predictors that play the primary role in accepting the particular system. The effect of moderating variables with respect to gender and age impacts the acceptance level. The findings of this research study also show that female researchers use online library databases conveniently and preferably, as compared to male researchers.

Implications- The results of this research study will help out teachers, students, and institutional administration in their academic pursuits. The faculty can get a better idea of how to teach and lead researchers from the available digital information resources and services provided by the university libraries. It will also help in decision making about the selection or rejection of resources for the library's users/ students.

Originality/value- This research study provides valuable/ important insights into key factors that impact and affect user's perception & intention to use and accept library technological services and digital resources from the Pakistani perspective.

Keywords- Technology acceptance; User's perception; acceptance behavior; technology adoption; Pakistan TAM, electronic information resources.

Research type Research Paper

Introduction

The internet and related global information networks have emerged as transformative technologies, providing continuous and flawless access to an extraordinary lot of information while posing an existential challenge to the libraries, which had previously worked as the primary source of information (Yu & Huang 2020). Libraries are changing and evolving to be relevant in this drastically changed information ecosystem. It is one of the most significant technological breakthroughs of the late twentieth century. The internet has had a significant impact on our way of life as a result of technological advancements and the availability of a wide range of broadband services; the twenty-first century can be seen as a culmination of the internet's widespread use, which not only creates numerous business opportunities but also reduces the distance between time and space (Munir, Shabir & Sharif 2021a). People may swiftly search and send information, maintain interpersonal ties, acquire emotional support, and receive quick responses due to the internet, which is gradually becoming incorporated into everyone's life. People are getting more variegated and convenient as a result of technological advancements and the expansion of the internet (Wu & Wu 2019).

The library technology like self-service technologies, online repositories, digital phone, and social networking sites, research data management software, full-text databases bibliometrics, open access presses, electronic reference services, digital literacy, among supports storage & retrieval, processing and dissemination of information with an effective

process to meet library user's needs. The library hardware, software, training, installation, networking, and online/ offline databases are considered library technology. It is much evidence that there are many advantages of these technological resources for library users. The library users can enjoy fast internet speed, speedy access to required resources, utilization of digital resources within library premises, non-stop 24/7 access, and access to online library databases from home or anywhere (Chan, 2009). The researchers need to understand the user's perception of library online databases. Technology Acceptance Model (TAM) states that acceptance of technology mainly depends on two major variables Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of the technology. Both of these factors figure up users' attitudes towards the use of the technology, which leads to users' behavioral intentions to use the technology. Users' (Munir, Shabir & Sharif 2021b)? These two significant variables Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), help to understand users' perception of online library databases. According to Davis (1989), PEOU (perceived ease of use) is "the degree to which a person believes that using a particular system would be free from effort. According to the online Merriam-Webster Dictionary "Usefulness is the quality of having utility and especially practical worth or applicability." PU (Perceived Usefulness) is the level that checks the user's belief, whether the particular system is enhancing his/her job or research efficiency or not. The traditional contents/ collections and service quality has been replaced with technological resources. Currently, the information is available in formats like online library databases, full-text articles, journals, magazines, newspapers, current collection access, archival access, conference proceedings, text, chart, and multimedia resources are also available on the user's desktop. There are also many types of online library databases, like indexing databases, full-text, and subject specialized, which are providing information (R. Pawar & Moghe, 2014).

By explaining the users' perspective, this research study helps out the academic libraries as well as general libraries in identifying and understanding the factors that affect the technology acceptance of library users. The Internet is considered a universal communication system; the whole world is connected with the help of fibre. It is also a medium for association and collaboration between person to person and their computers without geographical differences (Pan 2020). The availability of digital information resources and services is another significant fact that helps users in acceptance and use. This research study has evaluated the level of acceptance and use of available technological

services. Hence, academic researchers are exploring the reasons and factors that are impacting user's behaviors and intentions concerning acceptance and adoption of innovative technology (Zaman, Bhatti, & Khurhid, 2018).

Talking about the existing gap, this research study will examine the moderating effect of age and gender on the students in the context of using online library databases in public and private sector universities of Lahore, Pakistan.

Previous research has found gender variations not only in acceptance and use of technology (Venkatesh & Morris 2000; Ong & Lai 2006) but also in self-service technology (Elliott & Hall 2005; Lee, Fairhurst & Cho 2013). This study provides a deeper knowledge of and insights into how gender influences the adoption of self-service technology in the setting of libraries by investigating the moderating effects of gender (Wu & Wu 2019). This research study has the following objectives; 1) Perceived ease of use and usefulness have a positive and significant effect on users' attitudes toward using and accepting technology. 2) To investigate gender-wise perceptions about the usefulness of technology for their research work. 3) Perceptions of the service together with the user satisfaction with available digital resources and services. To best my understanding and knowledge from the reviewed literature, this research study is the first kind of study in Pakistan that is focusing on users' acceptance and satisfaction levels with the available digital library resources and services.

Literature Review

The user's acceptability of technological resources and services based on product/ services. PU and PEOU are the primary factors that impact individual beliefs and their attitude toward the use of online library databases (Patricia Aguilera-Hermida 2020). Studies of user behaviors in the information technology part have frequently stressed the concept of instrumentality. For instance, the technology acceptance model (TAM) has established that utilization behavior is stimulated by instrumentality and complex intellectual beliefs. In contrast, An alternate line of study, which draws its scientific foundation from an individual's psychology, suggests that an individual's action toward new IT is formed by their holistic experiences with the technology (Akbari et al. 2020).

TAM (Technology Acceptance Model)

The Technology Acceptance Model (TAM) was introduced in 1989, which has always been considered the most common and influential model to measure user's behaviors. This model was adopted from the (TRA) Theory of Reasoned Action by Ajzan and Fishbein in 1975 and, later on, Davis proposed the TAM model. According to Estriegana, R. et al. (2019), more than 145 research articles have been published on the particularly TAM model. Several conferences have been organized for the futuristic directions of TAM (Lee, Kozar, & Larsen, 2003). It emphasized the beliefs and characteristics of an individual, especially the technology acceptance and perception of the restrictions. It highlighted the barriers and issues regarding the acceptance of technology by the user's and their level of acceptance and satisfaction (Varma, 2010). For the last 24 years, the TAM remained a unified, popular, and convincing theory and information system (Amofa, 2014). TAM is about the user's attitude towards technology acceptance or rejection, assessing the usefulness according to the user's point of view. It measures the performance of technology and shows how it is easy to use (Davis, 1989). Furthermore, the TAM model's a direct impact on individual behavior in the context of usage. There are seven factors of societal impacts/ social influence process and cognitive instrumental processes that affect users' behaviors described by TAM

Perceived usefulness & perceived ease of use.

TAM model assumes an individual's information need and acceptance determination with the user's point of view with two prominent variables and components.

- i. Perceived Usefulness (PU) (the intention to use, user training, computer experience, system quality)
- ii. Perceived Ease of Use (PEOU) (computer self-efficacy, perception of outward control, ease of use, internet self-efficacy, the efficiency of library online databases uses, computer anxiety while using, concerns about the required information, perceived pleasure and impartial usability, behavior, and intention)

TAM models suggest increasing hands-on experience to use technology and systems (Venkatesh & Davis, 2000). TAM is the only model that is frequently used model from all over the world (globally). This model is developed in the US initially, and now it is being used in different countries. Yousafzai et al., (2007) performed concrete and meta-analysis

on TAM and more than 145 articles published and found a relationship between perceived ease of use & perceived usefulness, exerted a significant impact on behavioral intention (Estriegana, Medina-Merodio & Barchino 2019). TAM is a well-known and broadly authenticated model of technology acceptance and use because this is a flexible model and can be modified according to every country's customs and system. The data collected and analyzed from the 400 people around the world for this study showed that there is no impact of cultural differences, distances, power, economic factors, etc. regarding technology acceptance of researchers and library users (McCoy, Galletta, & King, 2007). Security, uncertainty, dependency, and expertise are essential factors for future human concerns. People always feel anxious about these factors even if they try to cope with the uncertainty of law, religion, policies, and procedures according to the country's situation (Gregory, 1982).

Research Methodology

Conceptual Framework

This research study adopts the technology acceptance model (TAM) as a theoretical model for constructing behavioural behaviors. This research constructs include “perception ease of use,” “perception usefulness,” “attitude,” and “behavior intention.

This research study is quantitative and intended to explore the expression we use for a qualitative study of users' technology acceptance while accessing and using online library databases. According to the categorization posted on the Higher Education Commission (HEC) of Pakistan website, the population was made up of public and private general categories universities and post-graduate researchers (MS, MPhil, PhD, and Postdoc) were selected because selected population are considerably experienced and well known to required research databases/ digital resources.

Object & Measurement Development

The items chosen must represent the topic about which generalizations are to be made to ensure the content validity of the scales. To assess computer self-efficacy, perceived utility,

perceived ease of use, and behavioural intention to use validated questions adapted from previous studies were employed (Compeau & Higgins, 1995; Davis, 1989; Venkatesh & Davis, 1996). The survey instruments were used to assess whether respondents agreed or disagreed with the research instrument's five-point Likert type scale to quantify people's perceptions and attitudes. All the variables were scored from 1 to 5, according to the degree of the respondent's approval of the survey item: 1-strongly disagree, 2-disagree, 3- Neutral, 4- agree, 5- strongly agree.

We examined demographic characteristics in line with previous studies on social and organisational behaviour: gender and age (*see figure 1*).

The questionnaires consisted of 4 questions with a total of 11 items and received 267 valid responses from research users. An online questionnaire was developed and shared with students via librarians. Secondly, the researcher made a list of all ex-colleagues and requested them to help in obtaining data from their postgraduate students. Thirdly, the researcher used various social media sites such as Facebook, LinkedIn, emails, and different M.Phil. /PhD. online groups to contact them.

Analysis Method

After data collection, all answers were entered into SPSS (Social Package for Social Sciences) version 23.0. The accuracy of data was ensured while coding the questionnaire in the software. The coding was counter checked, and the errors were removed.

Data Analysis

The study's findings indicate that the majority of participants were women.

The respondents' demographical frequency distribution status is presented in [Figure 1](#), which shows the female response rate is high at 141 (58.1%), while the male response rate is as low as 102 (42 %). [Figure 1](#) also describes age-wise results, the researcher made three age groups 1- 34 or below years, 2- 34-54 years, and 3- 54- above years. The highest response rate among the first group consisted of 93 females (38.27%) and 49 males (23%). The highest response rate among the second age group consisted 48 males (19.8%) and 41 female (16.9%) and the lowest response rate of the third age group 54 and above female users 07 (2.9%) and male users 05 (2.1%). [Figure 2](#) shows the results of males against each question item being asked by the researcher similarly [Figure 3](#) described female responses. The results indicate that 39% of male users agreed that the online library databases are easy

to use and 5% strongly disagree with this statement, and for female users, 35% were neutral and 4% strongly disagree. 40% males agree and 7%strongly disagree with the statement that online while 3% females remained neutral and 45disagreed with the asked statement. OD are easy and understandable (male 30% neutral & 4% strongly disagree) & (female 35% neutral & 4% strongly disagree). OD are easy to use (male 46% agree & disagree 9% strongly disagree) & (female 48% agree and 3% disagree). Library databases expand searching information (male 44% agree & 2% strongly disagree) & (female agree 43% & strongly disagree 3%). Online library databases save time (male 42% agree & 2% disagree) & (female users 50% agree & 2% disagree). Online Lib-databases are useful (male agree 47% & s-disagree 6%) & (female users 57% agree & 3% s-disagree). Library databases are more convenient to use rather than traditional (male users 37% agree & 5% strongly disagree) & (female 35% agree & 5% strongly disagree). Online library databases make it easier to work and study (male 40% agree & 4% strongly disagree) & (female users 37% agree & 3% strongly disagree)

Figure 1 Demographic Response Results

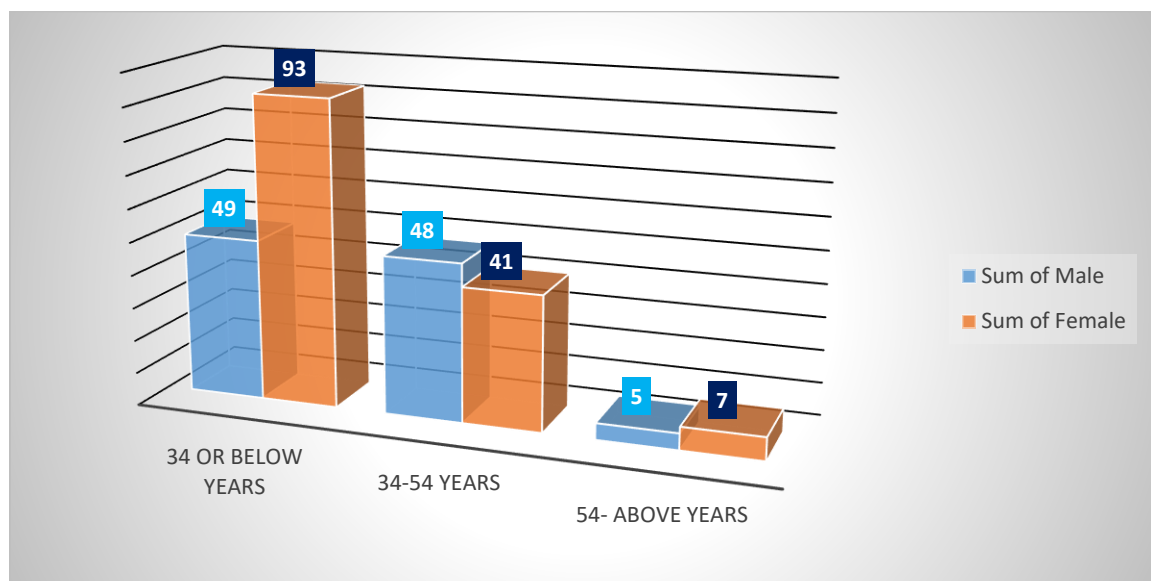


Figure 2 Male User's Response Rate

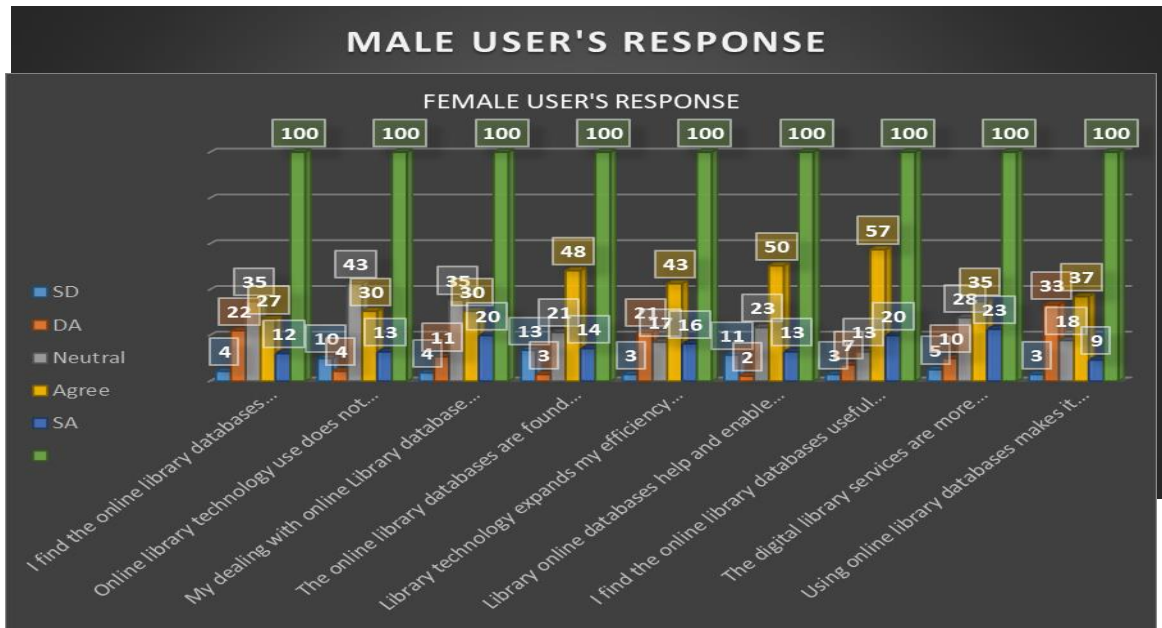


Figure 3 Female User's Response Rate

Discussion

The students assumed that by using online services, they would be able to complete their educational tasks effectively and swiftly. Furthermore, their utilization of the services will have a good impact on their academics, resulting in improved academic performance (Arif, Ameen & Rafiq 2018a). The capability of a system to assist users in completing their research and academic activities rapidly will eventually drive them to use it. As a result, students who recognized the benefits of using online services would be much more encouraged and motivated to use them (Taiwo & Downe 2013).

Age is one of the important demographic characteristics that influence a person's perception, attitude, and behaviour (Nosek, Banaji, & Greenwald, 2002). Previously many studies were conducted on information online systems (Morris & Venkatesh, 2000; Morris, Venkatesh, & Ackerman, 2005; Sun & Zhang, 2006; Venkatesh, Morris, Davis, & Davis, 2003; Venkatesh, Thong, & Xu, 2012) where it was found that age plays an important moderating role in explaining researchers/users' behaviours.

The findings of this research study confirmed that the age variable influence user's need and usage rate because the male user's below 34 years shared their feedback 49% and similarly female users below 34 years' response rate is 67%. A previous research study

(Binyamin, Rutter & Smith 2020) supports our research results that the younger students and researchers were observed significantly motivated as compared to elders.

The association between performance expectancy (also known as PU) and BI is affected by age, with the relationship being stronger for younger users. The previous research study's findings are consistent with past attitude research, confirming that younger users are more motivated by extrinsic benefits, which are directly linked to usefulness (Binyamin et al. 2020).

In order to demonstrate how women and men vary in their choice processes regarding acceptance and usage of e-learning, this study not only analyses gender differences in perceptions of computer self-efficacy, perceived usefulness, perceived ease of use, and behavioural intention to use; it also investigates the relative influences of different dominants, illustrating how women and men varied in their decision-making processes regarding acceptance and usage of e-learning (Ong & Lai 2006). When we looked at the data by gender, the results backed up our projections. Almost all of the published measures showed substantial gender differences. Our data revealed that men's ratings were higher than women's with respect to online library databases are “easy to use” “do not require mental efforts” “more convenient than traditional library resources” “online databases support to make easy research work”.

The findings of our research are similar to the results of research studies previously conducted in support of these results as male users have felt greater that the online library databases are easy to use. (Dalle, J. 2010; Sheikshoaei, F., & Oloumi, T. 2011; Mensah, I. 2016; Chan 2009; Nguyen, S. P., & Mahundi, M. H, 2019). But a few more previous research studies are opposed to this research results and showed that the female users are perceived greater ease of use as compared to male researchers (Harbo and Hansen; 2012, Line, 1996).

This study also discovered that women's perceptions differed greatly from men's in respect to the online library databases are “user friendly” “save times” “work efficiently” “understandable”. According to Wood and Karten (1986), females engage greater as compared male users.

The user's perception of the ease of use is one of the primary factors that impact behaviors' in accepting technology. However, a few current studies (Park & Kim 2013; Arif, Ameen & Rafiq 2018b; Hao et al. 2019; Malik & Ayop 2020; Munir et al. 2021a) suggest that the

formation of perceptions about PU and PEOU has varying effects on the decision to accept technological information resources (Ha & Stoel, 2009). Inside the TAM, perceived usefulness acts as a significant factor. PU influences attitude and intention and aids implementation progress (Swan, 1981; Triandis, 1980). Winarto (2011) confirmed that there are many external variables; these can be used with TAM to adopt new skills. The researcher also identified about 70 external variables that users go through in acquiring new skills. There are four mainly variables 1 characteristic of an organization, 2 system characters, 3 individual researchers (user) characters and others (Yousafzai, 2007).

Acceptance of technology is impacted by the two behavioural variables. Technology Acceptance Model (TAM) introduced Perceived Usefulness (PU), one significant belief and as well as Perceived Ease of Use (PEOU) is the second vital belief of the end-user, and both variables have actual relation with acceptance of the user's behaviors (Fred Davis et al., 1989). According to Davis (1989), perceived ease of use is "the degree to which a person believes that using a particular system would be free from effort". perceived usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance" (Wang & Tseng, 2011). How do researchers/ library users have perceived online library databases are easy to use?. This is a significant factor that impacts on user's behavior. These statements are used to evaluate this variable PEOU positively and effectively guide the effective use of online library databases.

- iii. Perceived Usefulness (PU) intends to use, the user's training, computer experience, system quality, and individuals' belief about a system that increases job/ research performance.
- iv. Perceived Ease of Use (PEOU) (computer self-efficacy, perception of outward control, ease of use, internet self-efficacy, the efficiency of library online databases uses, computer anxiety while using, concerns about the required information, perceived pleasure and impartial usability, behavior, and intention)

PEOU and PU variables are leads to acceptance of electronic resources and other digital services (Rafique, 2020).

Limitation

However, there are a few limitations of this research study that can be addressed in future research. First, the study is limited only to the Pakistani researcher's perspectives, and the similarity of university students may not be generalizable to mass users. For example, some students may not be members of the selected population. Therefore, the generalizability of these results with other institutions needs to be done with carefulness (Compeau et al., 2012). The university users of small cities are deprived of as compared to big city institute users so the results can be different according to the area and facilities. It is possible, and we cannot get comparable gender-based data from other cities and institutes because female representation can be diverse. It is also possible that the issue of lack of resources exist in other cities of different regions.

Recommendations

A web page should be constructed to suggest the intended utility to boost perceived usefulness. It is important to emphasize usefulness not only because it is perceived, but also because it must be highlighted in order to expand its perception. Universities should continue to instruct students about the use of information technologies, demonstrating their usefulness—As new tools are being developed on regular basis, training is an ongoing effort (Jan & Contreras 2011).

- The results of this research study will help out teachers, students, and institutional administration.
- The faculty can get a better idea of how to teach and lead researchers from the available resources and services proved by the university libraries.
- The limited access policy should be changed to allow students access to all full-text publications in international databases
- Management will be in an acceptable position to make decisions about what kind of resources will be suitable and desired for researchers. For example, library management can provide a better idea about the student and demands regarding online library resources. After having such facts, the management will be in a better position to make decisions regarding financial management, subscription of

resources, and an arrangement of access to the most appropriate and needed information resources.

- University researchers will be able to identify the required resources from their institutional libraries.

Conclusion

The application of Information and Communication Technology (ICT) in all human institutions is a unique feature of the twenty-first century. The satisfaction discloses that the users were pleased, satisfied and mentally fulfilled by using the library's online digital resources.

Consequently, the present research study has highlighted the external factors that are barriers for library users with the mediating effects of PEOU and PU for their smooth acceptance. Therefore, it is time to evaluate the user's acceptance of technological resources and services that libraries provide and facilitate. As it will also help us to bring improvements in technology after use by the massive level users/ researchers, therefore; the user's responses will lead to bring hurdle free technological resources and services after profound evolution.

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Questionnaire

Section A: **Demographics: Please tick the appropriate option.**

A1- Gender Male Female

A2- Age 34 years or below 34-54 years 55 or above

Section-B:

- 1- **Factors that make you use the library online databases and other technologies. Please tick the appropriate option. All questions have 1 to 5 scale:**

1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree

B1	Perceived Ease of Use (how online library databases are easy for use)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
i	I find the online library databases (electronic resources) easy for me to use.					
ii	Online library technology use does not require a lot of mental effort.					
iii	My dealing with online library database technology is clear and understandable.					
vi	The online library databases are found easy to use and user friendly					
BII	Perceived Usefulness (how the system/ online databases can be useful for research)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
i	Library technology expands my efficiency in searching for information and using online library databases.					
ii	Library online databases help and enable me to save time.					
iii	I find the online library databases useful for me.					
vi	The digital library services are more convenient to use rather than traditional library services					
v	Using online library databases makes it easier for me to do my work/ study effectively.					