

BEHAVIOURAL INTENTION OF  
UNDERGRADUATES TO ADOPT DIGITAL  
LIBRARY: AN INVESTIGATION INTO PRIVATE  
UNIVERSITIES IN MALAYSIA

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- (2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.
- (3) Equal contribution has been made by each group member in completing the research project.
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## LIST OF ABBREVIATIONS

BI	Behavioural Intention
E-Book	Electronic Book
E-Bookcase	Electronic Bookcase
EE	Effort Expectancy
E-Learning	Electronic Learning
E-Library	Electronic Library
FC	Facilitating Conditions
HB	Habit
HM	Hedonic Motivation
IQ	Information Quality
ISSM	Information Systems Success Model
M-Learning	Mobile Learning
MLR	Multiple Linear Regression
PE	Performance Expectancy
PLS	Partial Least Squares
PLS-SEM	Partial Least Squares Structural Equation Modelling
PV	Price Value
r	Correlation Coefficient
R <sup>2</sup>	Coefficient of Determination
SEM	Structural Equation Modeling
SI	Social Influence
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
UTAUT2	Unified Theory of Acceptance and Use of Technology 2
VIF	Variance Inflation Factor

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## PREFACE

Library is the repository for the valuable information which can be used as a reference of teaching, learning, and research. Before the invention of the Internet, people access information through the traditional library (physical library). However, technology evolution has accelerated the digitalization of library resources for which alters the searching behaviour of most people. With the expansion of the needs for information, management team of the universities may also take advantage of this technology to enhance the students' knowledge by introducing digital library in universities. Unfortunately, undergraduates nowadays still prefer using search engine to find information instead of digital library. Hence, this research was conducted to investigate the determinants that influence the behavioural intention of undergraduates to use digital library among private universities. The research findings can provide some useful information to the management team of universities in making improvement in the right areas so that it is able to greatly attract the attention of undergraduates to efficiently utilize the digital library resources.

## ABSTRACT

Digital library is gradually becoming an indispensable self-learning tool especially for students who are pursuing tertiary education. However, many students still underutilise digital library resources. This issue then triggers the need of investigating the drivers that affect undergraduates' behavioural intention to use digital library among the private universities in Malaysia. In order to enhance the fitness of Unified Theory of Acceptance and Use of Technology 2 model in determining the antecedents, information quality from Information Systems Success Model was integrated into the proposed conceptual framework. The determinants analysed comprised of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, and information quality. For data collection purpose, questionnaires were distributed to 500 undergraduates of Malaysian private universities through either online or face-to-face methods. The sampling locations included Melaka, Perak, Selangor, and Sarawak. Reliability test, normality test, Pearson Correlation Coefficient analysis, and Multiple Linear Regression were utilized for data analysis. The results show that all independent variables had a positive and significant association with behavioural intention to adopt digital library except for effort expectancy. Conclusively, this research successfully developed a new modified UTAUT2 and verified its applicability in digital library study.

## **CHAPTER 1: RESEARCH OVERVIEW**

### **1.0 Introduction**

This chapter provides a brief understanding on research topic by discussing the background, problem statement, research objectives and questions, and significances of research.

### **1.1 Research Background**

Internet is a brilliant human innovation that has revolutionized the world in many aspects. Technology advancement enables information to be stored online and easily accessible through, for instance, digital library (Kumar & Rao, 2014). According to statistical report from Malaysian Communications and Multimedia Commission (2015), 66.6% of the population in Malaysia was internet users in 2014. Besides, another statistical report showed that Malaysia's Internet penetration rate achieved 67.5% in 2015 ("Asia Internet Usage," 2016).

Malaysia is a rapidly growing e-learning country that achieves 41% of growth rate in adopting e-learning (Thompson, 2015). Digital library is essential in promoting the e-learning process as it provides various library services and information at anytime and anywhere owing to Internet accessibility (Alzaza & Zulkifli, 2007). Many educational institutions have introduced digital library as a complement to conventional library. Currently, there are approximately 41 digital libraries among all the Malaysian private universities to support the e-learning process (refer to Appendix 1.1).

Digital library, e-library, hybrid library, or virtual library refers to the electronic collections of information and intellectual services which can be accessed remotely on any computers that have Internet accessibility (Trivedi, 2010). For



instance, digital library provides many vital resources such as e-books, journals, and databases (Sahak & Masrek, 2014).

Next, behavioural intention is the perceived likelihood or subjective probability of an individual to engage himself or herself with a particular behaviour (Nysveen, Pedersen, & Thorbjornsen as cited in Alawamreh & Elias, 2015). Several models have been proposed to investigate individual's acceptance and intention to adopt digital library (Miller & Khera, 2010).

Further research in digital library study is of paramount importance as it can benefit the students and researchers to access academic resources in a more flexible and convenient way. Particularly, the dominant advantage of digital library is allowing students and researchers to access free full text of electronic articles that are not available alternatively in the conventional library and search engines such as Google, Yahoo, and Bing (Alfaresi & Hone, 2015).

## **1.2 Problem Statement**

### **1.2.1 Research Problem**

Nowadays, university libraries have been automated by information and communication technology to ease students' information searching process in completing their academic works (Kumar, 2012). Universities have invested significant amount of money in acquiring adequate library resources and upgrading library's facilities to benefit the students. Unfortunately, students still desist from making the best use of the digital library (Agboola & Bamigboye, 2011).

Sahak and Masrek (2014) advocated their disappointment on the minimal usage of library resources by students. They discovered that digital library

is not students' primary choice in information seeking. Besides, according to Low, undergraduates prefer using search engines, particularly 'Google' instead of digital library despite of its limitation in providing authentic, reliable, and credible sources of scholarly information (as cited in Chen, 2015). This is also supported by a study which revealed that users prefer searching desired information through the web (Kumar, 2011; Nawaz, Ali, Batool, & Alaudeen, 2015).

### **1.2.2 Past Studies that have Addressed the Problem**

In the past, researchers have made several efforts to explain the user's behavioural intention in using digital library by employing different models. Existing empirical studies that were conducted abroad integrated Technology Acceptance Model (TAM) and some external variables to predict the factors affecting users' intention to use digital library (Farahani & Kaviani, 2011; Hindagolla, 2014; Hong, Thong, Wong, & Tam, 2002; Park, Roman, Lee, & Chung, 2009; Tella, 2011). Besides, several studies on the similar topic had been explored in foreign countries or Malaysian public universities (Bagudu & Sadiq, 2013; Dollah & Kadir, 2010; Kadir, Rahman, Mustaffar, Rahman, & Amin, 2014; Letchumanan & Tarmizi, 2011; Rahman, Jamaludin, & Mahmud, 2011b).

Prediction on the users' intention to adopt digital library had also been enhanced by a few studies through utilizing Unified Theory of Acceptance and Use of Technology (UTAUT) model (Awwad & Al-Majali, 2015; Chang, 2013; Rahman et al., 2011b). Moreover, some researchers adopted Information Systems Success Model (ISSM) to explore users' intention to use digital library (Etinger, Šehanović, & Ribić, 2014; Huang, Pu, Chen, & Chiu, 2015; Samadi & Masrek, 2013). The results showed that information quality in ISSM was indeed related to the behavioural intention (Huang et al., 2015; Samadi & Masrek, 2013).

### **1.2.3 Deficiencies in Past Studies**

A few deficiencies could still be discovered from the past studies mentioned in the previous section. Firstly, studies on determining users' intention to use digital library in Malaysian private universities were found to be limited. Next, there are scarce past literatures using comprehensive model like UTAUT2 to investigate users' intention to adopt digital library which might result in limitation of research results as only few factors were taken into account by the applications of TAM, Theory of Planned Behaviour, and UTAUT. In fact, multiple relevant factors should also be considered.

In addition, since majority of the researches were conducted abroad, the findings may not be applicable in Malaysia as the research results will vary due to background, cultural, and technological differences.

Lastly, information quality from ISSM was rarely combined with UTAUT2 to investigate users' behavioural intention to adopt digital library. This can be a deficiency because the past researchers were unable to meet the UTAUT2 founders' expectation that other relevant determinants should also be incorporated in studying various consumers' use of technology (Venkatesh, Thong, & Xu, 2012).

Consequently, the underutilisation of digital library and the gaps in earlier studies trigger the need of identifying factors that will influence users' intention to use digital library.

## **1.3 Research Objectives and Questions**

To address the underutilisation problem of digital library, this research concentrated on the following general objective and question:

Table 1.1: General Research Objective and Question

<b>General Research Objective</b>	<b>General Research Question</b>
To examine the antecedents that will influence the behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.	What are the antecedents that will influence the behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.

Source: Developed for the research

This research has achieved seven objectives and answered seven questions specifically as follows:

Table 1.2: Specific Research Objectives and Questions

<b>Specific Research Objectives</b>	<b>Specific Research Questions</b>
1. To investigate the relationship between performance expectancy and behavioural intention to use digital library among undergraduates in private universities in Malaysia.	1. What is the relationship between performance expectancy and behavioural intention to use digital library among undergraduates in private universities in Malaysia?
2. To study the association between effort expectancy and behavioural intention to use digital library among undergraduates in private universities in Malaysia.	2. What is the association between effort expectancy and behavioural intention to use digital library among undergraduates in private universities in Malaysia?
3. To explore the connection between social influence and behavioural intention to use digital library among undergraduates in private universities in Malaysia.	3. What is the connection between social influence and behavioural intention to use digital library among undergraduates in private universities in Malaysia?

4. To find out the linkage between facilitating conditions and behavioural intention to use digital library among undergraduates in private universities in Malaysia.	4 What is the linkage between facilitating conditions and behavioural intention to use digital library among undergraduates in private universities in Malaysia?
5. To determine the correlation between hedonic motivation and behavioural intention to use digital library among undergraduates in private universities in Malaysia.	5. What is the correlation between hedonic motivation and behavioural intention to use digital library among undergraduates in private universities in Malaysia?
6. To ascertain the relationship between habit and behavioural intention to use digital library among undergraduates in private universities in Malaysia.	6. What is the relationship between habit and behavioural intention to use digital library among undergraduates in private universities in Malaysia?
7. To examine the association between information quality and behavioural intention to use digital library among undergraduates in private universities in Malaysia.	7. What is the association between information quality and behavioural intention to use digital library among undergraduates in private universities in Malaysia?

Source: Developed for the research

## 1.4 Significances of the Study

Academically, this research has successfully developed and verified a new modified UTAUT2 to be applied particularly in digital library study. Integration of ISSM into UTAUT2 has been proven to better suit the digital library context when price value from UTAUT2 was superseded by information quality from ISSM as one of the predictors in this study.

Next, this study may be one of the pioneer researches that can fill the research gap in which UTAUT2 is unusually used to scrutinize undergraduates' behavioural

intention to adopt digital library. In addition, this empirical analysis shed new light on the digital library adoption as private universities were chosen as the subject of this research. Ultimately, future researchers may also deliberate using this modified UTAUT2 in similar studies.

Practically, this research offers guidance to universities in recognizing which variable from the modified UTAUT2 is the strongest determinant that may stimulate the use of digital library among undergraduates. Specifically, this research will contribute to the universities that have yet to implement digital library in aspects of comprehending the undergraduates' needs better by considering all the significant factors or only the most influential antecedent in developing digital library services that are most appealing to the undergraduates.

The universities with digital library may also aware of the important features of the existing digital library that should be maintained and upgraded constantly so that they can always fulfil undergraduates' requirements and encourage them to continue using digital library. For instance, if effort expectancy is revealed as the greatest contributor of behavioural intention, it is vital for the universities to prioritize the digital library's ease of use in order to stimulate the use intention of the undergraduates.

## **1.5 Chapter Layout**

Research background, problem statement, research objectives and questions, and research contributions are introduced in Chapter 1. Past literatures, theoretical foundation, proposed conceptual framework, and hypotheses are illustrated in Chapter 2. Research design, data collection and sampling techniques, variables and measurements, data processing, and data analysis tools are discussed in Chapter 3. Meanwhile, Chapter 4 is furnished with analyses of results including descriptive analysis, scale measurement, and inferential analysis. Lastly, Chapter 5 provides statistical analysis summary, discussions of main results, implications, imperfections, and suggestions for the study.

## 1.6 Conclusion

Identification of the problem statement and research objectives and questions provides a clear direction to continue with the following chapters. The next chapter will present a comprehensive literature review of the study.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.0 Introduction**

This chapter reviews the prior researches and theoretical models in similar research areas. Besides, a proposed conceptual framework will be constructed to demonstrate the relationship between dependent variable and independent variables, and hypotheses will be formed.

### **2.1 Review of the Literature**

#### **2.1.1 Definitions of Dependent Variable and Independent Variables**

Definitions of dependent variable and independent variables are attached as Appendix 2.1.

#### **2.1.2 Behavioural Intention (BI)**

BI is regarded as a signal of actual behaviour (Fishbein & Ajzen as cited in Chang, 2016). Some researchers advocated that actual behaviour is affected by BI immediately and that it can be predicted most precisely by a good measure of intention (Ajzen as cited in Zhu, Wei, & Zhao, 2016). Hence, BI is a prime driver to shape actual adoption of digital library (Li & Lai, 2008). Additionally, several recent studies validated the significant positive impacts of BI on actual adoption of technology in academic contexts such as computer supported collaborative classrooms (Ali, Nair,



& Hussain, 2016) and ReWind, a lecture capture system (Nair, Ali, & Leong, 2015).

Nevertheless, actual adoption itself is difficult to be measured (Schuitema, Anable, Skippon, & Kinnear as cited in Zhu et al., 2016) and individuals would not interact with certain thing in deep if it failed to arouse their BI in the first place (Ding, Guo, Zhang, Qu, & Liu, 2016). Last but not least, many of the extant studies in educational settings such as academic use of Facebook (Sharma, Joshi, & Sharma, 2016), m-learning (Karimi, 2016), cloud-based virtual learning environment (Hew & Kadir, 2016), desktop web-conferencing in a blended management information system course (Lakhal & Khechine, 2016), and e-learning (Boateng, Mbrokoh, Boateng, Senyo, & Ansong, 2016) also incorporated BI instead of actual behaviour itself to assess adoption of technology. Thus, BI is appropriate and pivotal in probing into adoption of digital library.

### **2.1.3 Performance Expectancy (PE)**

To examine students' and lecturers' behavioural intention to use web 2.0 in e-learning, Usoro, Echeng, and Majewski (2013) collected the data face-to-face from 317 Nigerian universities' students and via e-mail from 273 respondents at one Scotland's university. Testing hypotheses with rank correlation coefficients, the authors revealed that PE had positive and significant impact on behavioural intention.

Moreover, Ayele and Sreenivasarao (2013) supported that PE had positive and significant connection with intention to use e-library services. Questionnaires were distributed to 276 academic staff and postgraduates in different universities and the hypotheses formulated were validated by utilizing structural equation modelling (SEM).

Lwoga and Komba (2015) investigated the drivers contributing to students' intention to continue using web-based learning management systems by collecting 231 questionnaires from third year undergraduates and tested the hypotheses using multiple regressions. Results depicted that PE had significantly positive effect on continued usage intention.

Tabassum, Roknuzzaman, and Islam (2015) also concluded that perceived usefulness, which is a construct similar to PE (Alwahaishi & Snasel, 2013), had a strong association with intention to adopt digital library. The authors gave 140 questionnaires to both library users and staff, of which 129 were valid and tested using chi-square test.

Nevertheless, Abdullateef and Allumi (2014) argued that PE had positive but insignificant relationship with behavioural intention to use online learning zone. Researchers collected 137 usable questionnaires via e-mail from postgraduates and undergraduates in a Malaysian university and analysed by SEM. They explained that effect was insignificant because the availability of required resources would not necessarily guarantee that students would definitely adopt the online learning zone. However, this finding may be questionable because the valid samples received were too negligible and merely from one university.

#### **2.1.4 Effort Expectancy (EE)**

Awwad and Al-Majali (2015) explored the drivers of behavioural intention to use e-library services. 575 usable samples among 700 questionnaires were gathered from students in the four largest public Jordanian universities. Results from SEM showed that EE had positive and the most salient relationship with the students' behavioural intention to adopt e-library services.

In examining students' behavioural intention in adopting m-learning, Mtebe and Raisamo (2014) personally distributed and e-mailed 1,000 and 518 questionnaires respectively to students from five higher educational institutions in East Africa. 823 valid questionnaires were received. Using linear regression analysis, the findings indicated that EE positively and significantly affected students' behavioural intention to use m-learning.

To explore the impact of particular user-driven factors on the intention to use video digital library, Ju and Albertson (2015) employed online survey and received 202 usable responses. Perceived ease of use, which is similar to EE as stated by Alwahaishi and Snasel (2013), was proven to have strongly positive influence on intention following the results of correlation coefficient and multiple regression analyses.

Hindagolla (2014) also demonstrated that perceived ease of use exerted a strong positive impact on the intention to employ electronic information sources. 538 completed samples from 610 questionnaires administered to final year undergraduates were analysed by multiple ordinary least square regression method.

Contrarily, Masa'deh, Tarhini, Mohammed, and Maqableh (2016) found that EE was less likely to affect students' usage behaviour on e-learning. 359 final responses out of 500 questionnaires have been collected from students and analysed by SEM. Nonetheless, the result remains less convincing as responses received in this research were only two times fewer than most of the previous studies cited.

### **2.1.5 Social Influence (SI)**

According to Al-Sultan (2015), SI positively and significantly affected behavioural intention to adopt e-library. This research targeted students from two higher educations in Kuwait. 212 out of 242 surveys were collected and analysed by SEM.

Besides, Farahat (2012) stated that SI had a positive and significant relationship with students' behavioural intention to use online learning. 141 questionnaires had been distributed to students and 20 incomplete questionnaires had been excluded. Pearson's correlation was employed as a data analysis tool.

Furthermore, Al-Gahtani (2016) conducted a research to investigate individuals' behaviour towards the assimilation of e-learning. 286 out of 600 questionnaires were collected from students of six targeted colleges. Results from partial least squares structural equation modelling (PLS-SEM) showed that SI had significant effect on the behavioural intention in using e-learning.

Next, Chang, Lou, Cheng, and Lin (2015) had investigated students' behavioural intention towards university library electronic resources by using combination of UTAUT and website service quality. 1,089 out of 1,206 surveys were valid and they were analysed by SEM. The results stated that SI positively affected behavioural intention.

Lastly, Evans and Le Roux (2016) had studied both academic staff and students' acceptance of using e-learning at University of Zululand. Only 405 and 73 valid questionnaires were collected from students and academic staff respectively. Data analysis tool used was PLS-SEM. SI was found to have the weakest positive relationship with behavioural intention but it had significant effect on students' acceptance of using electronic learning.

### 2.1.6 Facilitating Conditions (FC)

Chang (2013) employed UTAUT to describe users' behavioural intention of utilising library mobile applications in Taiwan's university libraries. 363 questionnaires were collected from undergraduates and graduates and then analysed by SEM. Findings showed that FC was positively associated with behavioural intention to adopt the digital library.

An investigation on undergraduates' acceptance level towards the incorporation of m-Learning in formal English Language Course had been conducted using UTAUT (Abdullah, Siraj, & Lim, 2014). 220 surveys were collected from a Malaysian private university's undergraduates. The data were then analysed by descriptive statistics. FC was found positively associated with use intention.

Iqbal and Qureshi (2012) investigated the students' perception to adopt m-learning by combining TAM and UTAUT. 300 structured questionnaires were sent to students from 10 chartered universities in Pakistan. 83% responses were received. Ordinary least square regression was used for hypotheses examination purpose and FC was found positively influencing the intention to use m-learning.

Moreover, Thomas, Singh, and Gaffar (2013) applied UTAUT to explain the behavioural intention to adopt m-learning in the higher education. 322 completed responses were collected from students through web survey of university of Guyana and analysed by using SEM. FC was found positively related to the behavioural intention.

According to Maduku (2015), FC was positively related to behavioural intention. The study investigated the gender differences in the factors of behavioural intention towards e-book use. 544 survey data were obtained from the students of two public universities and three private colleges in South Africa. The data were then analysed by regression analysis.

### **2.1.7 Hedonic Motivation (HM)**

Raman and Don (2013) conducted a research determining the factors affecting pre-service teachers' acceptance of Learning Management Software by using UTAUT2. 288 out of 320 Google online questionnaires were received from the undergraduates and hypotheses were analysed by partial least squares (PLS). HM was found positively influencing the behavioural intention to use this software.

Besides, Yang (2013) concluded that HM significantly and positively influenced undergraduates' behavioural intention to adopt m-learning. 182 valid responses were received from web-based surveys delivered to the students from an eastern China university. The hypotheses were tested using PLS.

Furthermore, Nguyen, Nguyen, and Cao (2014) supported that HM had a strong positive association with intention to adopt cloud-based e-learning in Vietnam. By applying convenience sampling, 282 usable questionnaires were received from both the users and potential users. The data were subsequently analysed by SEM.

Next, to examine students' intention to use m-learning, Bere (2014) distributed and eventually received 196 valid self-administered surveys from the students at University of Technology in Africa. From multiple regression analysis, HM had moderately positive effect on behavioural intention to employ m-learning using a mobile instant messaging application.

Oppositely, Ain, Kaur, and Waheed (2015) concluded that HM was insignificantly related with behavioural intention to use Learning Management System. 328 usable out of 349 closed-ended questionnaires were received from Malaysian university students who were the users and analysed by SEM.

These five studies had shown contradictory findings on the association between HM and behavioural intention to adopt online communities and this may be due to the different sample sizes used by the researchers.

### **2.1.8 Habit (HB)**

A study on m-learning acceptance had been conducted by using UTAUT2. 305 out of 325 surveys were collected from Korean's undergraduates and analysed using Pearson correlation analysis and multiple regression analysis. The findings showed that HB significantly influenced the undergraduates' behavioural intention to use m-learning (Kang, Liew, Lim, Jang, & Lee, 2014).

Next, HB was found positively influencing the behavioural intention to use classroom technology. 46 online surveys were received from the instructors of face-to-face classes at a South Eastern University and analysed using PLS (Lewis, Fretwell, Jim, & Parham, 2013).

Moreover, Nair et al. (2015) stated that HB significantly influenced the students' behavioural intention towards ReWIND, a complement system to support e-learning. 416 questionnaires were collected from students of Taylor University in Malaysia. However, only 398 questionnaires were suitable to be analysed by PLS-SEM.

Furthermore, Escobar-Rodríguez, Carvajal-Trujillo and Monge-Lozano (2014) conducted a research to investigate the factors influencing students' perceived benefits and relevance of utilising Facebook for academic purpose. 956 usable questionnaires were received and then analysed by PLS. The results showed that HB was a strong predictor of students' behavioural intention towards Facebook.

Contradictorily, HB was revealed to have significantly negative influence on teachers' acceptance and use of developed multimedia-enhanced content because habit is built through experience and it is impossible for teachers to acquire experience within short training period. 1,137 out of 2,000 self-administered questionnaires were collected and analysed by linear regression analysis (Mtebe, Mbwilo, & Kissaka, 2016).

### **2.1.9 Information Quality (IQ)**

Rahman et al. (2011b) collected data from four Malaysian public intensive research universities to study intention to use digital library. 534 usable questionnaires were collected from postgraduates and analysed using hierarchical regression analysis. IQ was found significantly and positively associated with intention to employ digital library.

A study in Iran was also carried out to study the intention of digital library users at University of Tehran. Data from 425 respondents were analysed using SEM. The results showed that IQ was a critical determinant of digital library usage behaviour (Samadi & Masrek, 2013).

Another study also showed that IQ positively and significantly influenced intention to use mobile library service system. 254 questionnaires were received from undergraduates and graduates at National University of Tainan and 206 valid data were analysed by PLS (Huang et al., 2015).

IQ was found positively affecting user intention to use e-learning system in Mohammadi's study (2015). 390 questionnaires were collected from students in four public universities of Tehran and analysed using SEM and path analysis.

However, Chiu, Chao, Kao, Pu, and Huang (2016) showed that IQ had no significant and positive impact on user's intention to adopt cloud e-



bookcase. 123 valid questionnaires were collected from three universities in southern Taiwan yielding response rate of 41% and further analysed by using PLS-SEM.

## **2.2 Review of Relevant Theoretical Models**

### **2.2.1 Identification of Theories for the Study**

UTAUT2 would be acted as the major theory accompanied by ISSM to investigate undergraduates' behavioural intention in using digital library.

### **2.2.2 Descriptions of UTAUT2 and ISSM**

Multiple theories that have been developed to study the users' intention to adopt new technology include Theory of Reasoned Action, Theory of Planned Behaviour, TAM, Motivational Model, Innovation Diffusion Theory, Social Cognitive Theory, and UTAUT (Venkatesh, Morris, Davis, & Davis, 2003).

Under UTAUT, only four key constructs including performance expectancy, effort expectancy, social influence, and facilitating conditions were employed to explain technology acceptance behaviour (Venkatesh et al., 2003). In 2012, UTAUT has been extended to UTAUT2 by inserting three new constructs which are hedonic motivation, price value, and habit (Venkatesh et al., 2012).

Basically, UTAUT2 is similar to UTAUT particularly in terms of independent variables but their other disparities are not ignorable either. Firstly, voluntariness of use was abolished as the moderator in UTAUT2

because consumer behaviours are utterly voluntary rather than obligatory and so, there will be no dissimilarity in voluntariness among consumers (Venkatesh et al., 2012). Furthermore, UTAUT concentrates on organizational context whereas UTAUT2 specifically focuses on individual context (Huang & Kao, 2015). Moreover, UTAUT2 has a stronger explanatory power as represented by higher coefficient of determination ( $R^2$ ). Statistically, UTAUT2 can explain 74% in consumer's behavioural intention and 52% in technology use whereas UTAUT can only explain 56% and 40% respectively (Venkatesh et al., 2012).

Meanwhile, ISSM was developed by DeLone and McLean in 1992 and updated in 2002 and 2003 (DeLone & McLean, 2003). It focuses on technology acceptance and information systems success (Zaied, 2012). ISSM's variables include information quality, service quality, and system quality which are presumed to affect the information usage (Samadi & Masrek, 2013). ISSM is frequently adopted to examine information system success such as e-learning system success (Mohammadi, 2015).

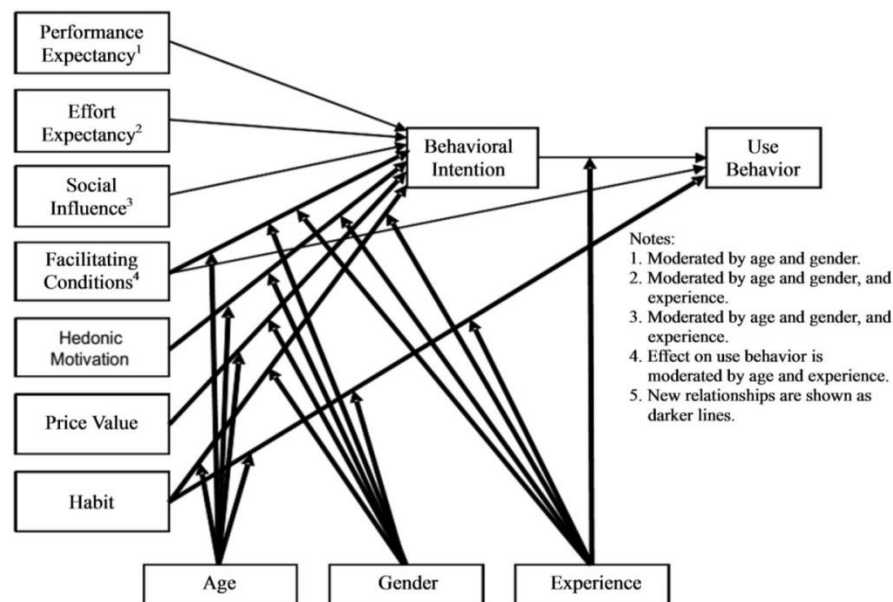
### **2.2.3 Applications of UTAUT2 and ISSM in Various Research Areas**

UTAUT2 has been widely used by researchers in different research areas such as online airline ticket purchasing behaviour (Escobar-Rodríguez & Carvajal-Trujillo, 2013), social network game players' continued usage intention (Xu, 2014), health care consumers' intention to use electronic health records portals (Tavares & Oliveira, 2014), and students' intention to use virtual learning agent (Ramli, Nathan, & Liew, 2015).

ISSM has also been diffusely employed by scholars in various research areas such as m-banking (Tam & Oliveira, 2016), web portal (Al-Debei, Jalal, & Al-Lozi, 2013), online shopping (Chen & Cheng, 2009), and e-commerce (DeLone & McLean, 2004; Wang, 2008b).

## 2.2.4 Concepts in UTAUT2 and Relationships among Them

Figure 2.1: UTAUT2



Adopted from: Venkatesh et al. (2012)

Figure 2.1 shows the original UTAUT2 developed by Venkatesh et al. (2012). Definitions of UTAUT2 concepts and their associations are stated in Table 2.1.

Table 2.1: Concepts in UTAUT2 and Their Relationships

Concept	Definition	Relationship
Performance Expectancy (PE)	“The degree to which using a technology will provide benefits to consumers in performing certain activities”.	Performance expectancy will have a direct impact on the behavioural intention to use a technology and an indirect effect on the use behaviour.

Effort Expectancy (EE)	“The degree of ease associated with consumers’ use of technology”.	Effort expectancy will affect the behavioural intention to use a technology directly and explain the use behaviour indirectly.
Social Influence (SI)	“The extent to which consumers perceive that important others (such as family and friends) believe they should use a particular technology”.	Behavioural intention to use a technology will be predicted directly by social influence while use behaviour will be influenced indirectly by social influence.
Facilitating Conditions (FC)	“Consumers’ perceptions of the resources and support available to perform a behaviour”.	Facilitating conditions will have a direct effect on both behavioural intention to use a technology and use behaviour.
Hedonic Motivation (HM)	“The fun or pleasure derived from using a technology”.	Behavioural intention to use a technology will be influenced directly by hedonic motivation whereas use behaviour will be explained indirectly by hedonic motivation.
Price Value (PV)	“Consumers’ cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them”.	Price value will predict the behavioural intention to use a technology directly and drive the use behaviour indirectly.

Habit (HB)	“The extent to which people tend to perform behaviours automatically because of learning”.	Both behavioural intention to use a technology and use behaviour will be directly affected by habit.
Behavioural Intention (BI)	“The degree to which a person has formulated conscious plans to perform or not perform some specified future behaviour”.	Behavioural intention to use a technology will result in actual use behaviour.
Use Behaviour	Actual usage frequency of a technology.	Use behaviour will be directly explained by behavioural intention, facilitating conditions, and habit and indirectly predicted by performance expectancy, effort expectancy, social influence, hedonic motivation, and price value.
Age	Moderators	Age, gender, and experience will moderate the effect of hedonic motivation and habit on behavioural intention.
Gender		
Experience		

		Only age and gender will moderate the effect of facilitating conditions and price value on behavioural intention. Experience will not significantly moderate the effect of facilitating conditions on behavioural intention.
		Age, gender, and experience will moderate the effect of habit on use behaviour.
		Experience will moderate the effect of behavioural intention on use behaviour.

Adapted from: Venkatesh et al. (2012)

### 2.2.5 Applications of UTAUT2 and ISSM in this Research

UTAUT2 and ISSM were amalgamated because of their suitability to predict the factors affecting the user intention. UTAUT2 was chosen as the major model instead of ISSM because UTAUT2 has stronger and sound theoretical background developed from previous models in explaining user's technology acceptance (Rondan-Cataluña, Arenas-Gaitán, & Ramírez-Correa, 2015). UTAUT2 incorporates technical structure and social norm like social influence which can effectively explain individual's behaviour (Xu, 2014). However, ISSM focuses mainly on providing a more comprehensive understanding towards the success of an information system (Machado-Da-Silva, Meirelles, Filenga, & Filho, 2014).

In this study, only six independent variables under UTAUT2 were employed to examine the behavioural intention to use digital library. Price value from UTAUT2 was replaced by information quality under ISSM. Justifications of excluding price value, moderators and use behaviour are explained below.

Firstly, digital library provides adequate and reliable resources to support the creation of powerful educational learning experience and encourages students to be independent learners (Edelson & Gordin, 1996; Kavulya, 2004). Many students also perceived that time and efforts spent in learning are more important than monetary costs (Ain et al., 2015). Thus, price value concept was irrelevant and eliminated from the core model (Baptista & Oliveira, 2015; Morosan & DeFranco, 2016; Raman & Don, 2013).

Since undergraduates targeted were in narrow range of ages, age was disregarded as a moderator (Wong, Tan, Loke, & Ooi, 2014). Next, gender and experience were also excluded as they have insignificant moderating effects on behavioural intention (Kimball, 2015; Rahman et al., 2011b). Finally, actual use behaviour was not investigated as this study did not focus on actual adoption of digital library (Wong et al., 2014).

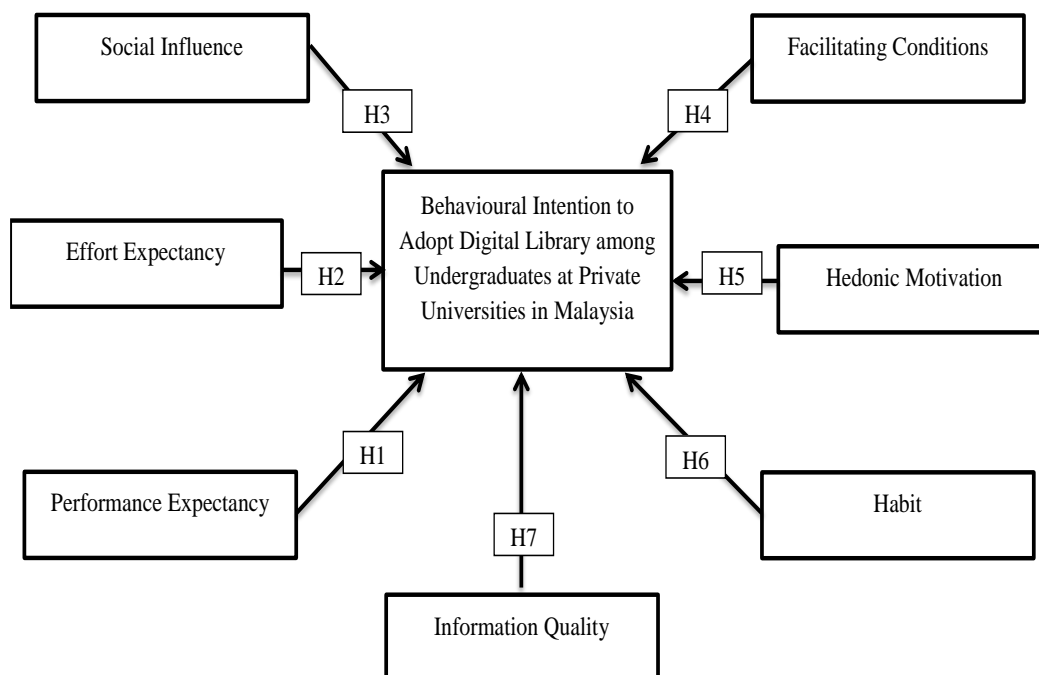
Generally, digital library is an information system on which its information is the most vital output (Wang & Lin, 2011). Many researches had shown that information quality has significant positive impact on behavioural intention to adopt digital library (Huang et al., 2015; Samadi & Masrek, 2013). Hence, information quality was added as it is a crucial antecedent to determine undergraduates' intention to use digital library and further improve the model.

Lastly, system quality and service quality were not incorporated due to redundancy issue. According to Janssen (2014), performance expectancy and effort expectancy are interrelated with system quality as they can detect time performance whereas effort expectancy and facilitating

conditions are able to detect technical issues as well as service quality. Thus, system quality and service quality may be inappropriate to be incorporated in this conceptual framework.

## 2.3 Proposed Conceptual Framework

Figure 2.2: Proposed Conceptual Framework



Adapted from: Rahman et al. (2011b); Venkatesh et al. (2012)

## 2.4 Hypothesis Development

All the independent variables were hypothesized to have positive impacts on behavioural intention following majority of the findings of prior empirical studies. Thus, seven hypotheses developed were as follows:



Table 2.2: Hypothesis Development

H1: There is a positive relationship between performance expectancy and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.
H2: There is a positive relationship between effort expectancy and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.
H3: There is a positive relationship between social influence and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.
H4: There is a positive relationship between facilitating conditions and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.
H5: There is a positive relationship between hedonic motivation and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.
H6: There is a positive relationship between habit and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.
H7: There is a positive relationship between information quality and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.

Source: Developed for the research

## 2.5 Conclusion

Many related articles are reviewed; and proposed theoretical framework and seven hypotheses are formed in this chapter. The next chapter will discuss thoroughly about research methodology of the study.

## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.0 Introduction**

This chapter presents an overview on the research design, data gathering approach, and sampling design. Additionally, it also clarifies the variables and measurement, data processing, and data analysis methods.

### **3.1 Research Design**

Quantitative research was conducted to investigate undergraduates' behavioural intention to adopt digital library in Malaysia. Survey method has been employed as it can describe the opinions of a large sample on certain issue (Fraenkel & Wallen as cited in Helvaci, 2015) rapidly and cost-efficiently (Goel, Obeng, & Rothschild, 2016). This was a cross-sectional study because survey was conducted for only few weeks (Merrill, 2012) and it only examined one phenomenon at one specific time (Gelo, Pritz, & Rieken, 2014). Cross-sectional study was best suited as it was impractical to interview or observe all Malaysian undergraduates within a tight budget and timeline. Thus, questionnaires were distributed to them through online or face-to-face.

### **3.2 Data Collection Method**

#### **3.2.1 Primary Data**

In this research, primary data in terms of self-administered questionnaires has been employed to collect data. The questionnaires were distributed by

the means of Internet (Google Form) and self-delivery and collection. Internet survey was used as the survey results can be recorded and stored immediately in an online database once the submission is made by respondents; and it is cheaper in terms of administration cost (Bhattacharjee, 2012). Next, face-to-face survey was employed because it provides significant advantages in terms of the quality, amount, and complexity of the data collected (Doyle, 2014).

### **3.3 Sampling Design**

#### **3.3.1 Target Population**

Target population of this research was Malaysian private universities' undergraduates. Private universities were being researched because National Higher Education Blueprint 2015–2025 estimated private university enrolment would increase 5.1% annually and may exceed the number of students in the public sector by 2025 (Ministry of Education Malaysia, 2015). Additionally, private universities were chosen as most of the past literatures had already investigated into Malaysian public universities.

Undergraduates were selected as they have dealt with the Internet environment since their tender age and so, they may exhibit more special digital information use patterns. Citing an example, undergraduates require digital library services to actively search for information for academic purpose (Lee, Paik, & Joo, 2012).

### **3.3.2 Sampling Frame and Sampling Location**

Sampling frame is unavailable as the undergraduates' details are kept private and confidential by the universities (Leng, 2010). Multimedia University Melaka, Universiti Tunku Abdul Rahman Selangor and Perak, and Curtin University Sarawak which are scattered in Southern, Central, Northern, and East Malaysia were the sampling locations.

These three universities were chosen because they provide the greatest number of subscribed e-databases among the Top 300 QS Malaysian private universities (refer to Appendices 3.1 to 3.3). Besides, Universiti Tunku Abdul Rahman and Multimedia University repositories ranked top 1 and 2 among Malaysian private universities as awarded by the Ranking of Repositories (refer to Appendix 3.4). Curtin University, Sarawak has also been included due to its varieties in learning resources and library facilities which provide the access to the library resources (EduSpiral Consultant Services, 2016). As respondents come from different States and pose distinctive races, culture, and belief, sample data can fairly represent the whole population (Sim, Tan, Wong, Ooi, & Hew, 2014).

### **3.3.3 Sampling Elements**

The participants were undergraduates from Malaysian private universities. More specifically, only undergraduates who have experiences in using digital library would be subject to analysis as only existing users could answer questions regarding habit (Venkatesh et al., 2012).

### **3.3.4 Sampling Technique**

Since the study of population was impracticable due to budget, time, and personnel constraints, sampling technique was applied (Awwad & Al-Majali, 2015; Kothari, 2004). Non-probability sampling could be used when there is limited resource available such as sampling frame that consists of the details of target respondents (Cooper & Greenaway, 2015). Convenience sampling approach was then adopted as it usually meets the selection criteria of the target respondents that are related to the research's objective (Saunders, Lewis & Thornhill, 2012). Participants would be easier to access once the consent from principal of each targeted university and participant has been obtained (Creswell, 2012).

### **3.3.5 Sampling Size**

According to Hinkin (as cited in Chepchirchir & Leting, 2015), item-to-response ratio should range from 1:4 to 1:10 for each set of variables. As 42 items were asked in the questionnaire, 168 to 420 samples are considered sufficient. Additionally, Sekaran (as cited in Radzi et al., 2014) also recommended that 384 sample size is suitable for any population larger than 100,000. Consequently, 500 printed and online questionnaires were distributed to undergraduates, of which 391 valid questionnaires were collected back.

## **3.4 Research Instrument**

Prior to actual data collection, a pilot test was run by involving 30 Universiti Tunku Abdul Rahman, Perak students to confirm the reliability of questionnaire (Browne as cited in Ryan, 2013).

The actual survey was directed for two weeks starting from 25 May 2016 to 7 June 2016. Most respondents were approached randomly face-to-face to ensure high response rate. Only few online questionnaires were sent to ease the data collection. Out of the 500 questionnaires distributed, 109 questionnaires were unusable due to invalid or incomplete data and thus only 391 questionnaires were valid, achieving response rate as high at 78.20%.

### 3.5 Constructs Measurement

Table 3.1 shows the number of survey items, operational definitions, and measurement for each variable.

Table 3.1: Operational Definitions of Variables

Variable	Item	Operational Definition	References	Measurement
Performance Expectancy (PE)	5	“The degree to which a student believes that using the digital library will help him/her attaining gains in assignment/ research performance”.	Venkatesh, Morris, Davis, & Davis (as cited in Khechine, Lakhal, Pascot, & Bytha, 2014)	Interval: 5-point Likert scales
Effort Expectancy (EE)	5	“The degree of ease related with digital library use”.	Venkatesh, Morris, Davis, & Davis (as cited in Chang, 2013)	Interval: 5-point Likert scales

Social Influence (SI)	5	“The degree to which a user perceives that important others believe he or she should use the digital library”.	Venkatesh, Morris, Davis, & Davis (as cited in Awwad & Al-Majali, 2015)	Interval: 5-point Likert scales
Facilitating Conditions (FC)	5	“The availability of facilities that support the respondents’ use of the digital library”.	Venkatesh, Morris, Davis, & Davis; Venkatesh, Thong, & Xu; Indrawati, Murugesan, & Raman; Indrawati; Wong, Tan, Loke, & Ooi; You; Foon & Yin-Fah (as cited in Indrawati & Haryoto, 2015)	Interval: 5-point Likert scales
Hedonic Motivation (HM)	5	“The enjoyment a person can experience from using the digital library”.	Venkatesh, Thong, & Xu (as cited in Gerhart, Peak, & Prybutok, 2015)	Interval: 5-point Likert scales
Habit (HB)	5	“The extent to which people tend to perform behaviours (use digital library) automatically because of learning”.	Limayem & Hirt (as cited in Clements, 2015)	Interval: 5-point Likert scales

Information Quality (IQ)	5	“The quality of the output provided by digital library”.	DeLone & McLean (as cited in Chen & Chengalur-Smith, 2015)	Interval: 5-point Likert scales
Behavioural Intention (BI)	7	“The degree to which a person has formulated conscious plans to perform or not perform some specified future behaviours”.	Ajzen & Fishbein (as cited in Lee, 2016)	Interval: 5-point Likert scales

Source: Developed for the research

Only reliable variables, for instance, with at least 0.70 Cronbach’s Alpha, were considered. Items with the highest factor loadings (if reported) and those most appropriate items in the context of digital library were then selected. Repetitive, ambiguous, confusing or unsuitable questions were excluded (refer to comments in articles softcopy for examples). Survey questions and their sources are attached as Appendix 3.5 and a sample of questionnaire is attached as Appendix 3.6.

### 3.6 Data Processing

First and foremost, questionnaires were checked thoroughly to exclude those with missing responses and respondents without experiences in using digital library from data processing. Subsequently, the first answer in Section A of questionnaire was labelled as 1 and so on while all the responses in Section B and C were coded as 1 to 5 depending on the degree to which the respondents agreed to the statements. Eventually, only valid data were analysed by SAS Enterprise Guide 5.1.



## **3.7 Data Analysis**

### **3.7.1 Descriptive Analysis**

Descriptive statistics summarizes and presents data in a meaningful way through numerical measurements, tables, and graphs (Wheelan, 2013). In this study, it was used to describe the demographic profile of the target respondents. The data were exhibited using pie charts which contain both frequency and percentage figures. The central tendency (mode and mean) and variability (standard deviation) were also analysed.

### **3.7.2 Scale Measurement**

Reliability test was conducted to evaluate internal consistency and precision of the items measuring a given variable (Lee, 2008). Cronbach's Alpha was employed to assess the reliability of questionnaire's items. According to Sekaran and Bougie, any variable with Cronbach's Alpha coefficient of 0.70 and above is regarded to have high reliability standard (as cited in Maiyaki & Mokhtar, 2011).

Next, normality test was conducted to determine data's normality through confirming the safety factor scores of questionnaires using Likert Scale (Wang, 2008a). Skewness and Kurtosis were used to test distribution type in which positive value indicates a positively-skewed distribution, and vice versa. Kline recommended that Skewness and Kurtosis value should range within -3 to +3 and -10 to +10 respectively to ensure data normality (as cited in Lee, 2008).

### 3.7.3 Inferential Analysis

#### 3.7.3.1 Pearson's Correlation Coefficient Analysis

Pearson's Correlation Coefficient analysis was executed to investigate the linear correlation between two variables (Samuel & Okey, 2015) which are interval data (Jackson, 2016). Normality assumption must be fulfilled for Pearson's Correlation Coefficient to be valid (Filed as cited in Chee, 2015).

From the results, p-value with less than 0.05 indicates a significant association between an independent variable and dependent variable, and vice versa (Hazra & Gogtay, 2016). Secondly, correlation coefficient ( $r$ ) represents the strength and direction of connection between an independent variable and dependent variable. Usually,  $r$  values range from -1 to +1. The stronger the correlation, the closer the  $r$  values to  $\pm 1$  (Samuel & Okey, 2015).

Additionally, the correlation between independent variables, as represented by  $r$ , should be less than 0.90 in order to avoid the multicollinearity problem (Hair, Black, Babin, & Anderson, 2010; Tabachnick & Fidell as cited in Badara & Saidin, 2014).

#### 3.7.3.2 Multiple Linear Regression Analysis

Multiple Linear Regression (MLR) analysis was conducted to explore the relationship between the seven independent variables and a dependent variable (Gupta, 2015). Key assumptions of MLR include normality and absence of multicollinearity (Tabachnick & Fidell as cited in Charles & Jaggernauth, 2015). MLR was used

because both independent variables and dependent variable were measured on interval scale (Richter, 2012).

From MLR results,  $R^2$  indicates the percentage of variation in dependent variable that may be predicted by the independent variables modelled (Samuel & Okey, 2015). Next, p-value from analysis of variance table that is less than 0.05 reveals a good model fit (Kamen, Ejim, Nwakaudu, & Onyelucheya, 2015). Moreover, Parameter Estimates can be used to interpret the value of intercept ( $\beta_0$ ) and slope coefficients ( $\beta_n$ ) in developing the MLR equation. The  $\beta_n$  value indicates change in dependent variable for every increase in an independent variable (Boyle & Schmierbach, 2015). Besides, hypothesis will be accepted if the p-value obtained from Parameter Estimates is below 0.05, and vice versa (Hazra & Gogtay, 2016). The MLR equation constructed for this study is as follows:

Table 3.2: MLR Equation

$BI = \beta_0 + \beta_1 (PE) + \beta_2 (EE) + \beta_3 (SI) + \beta_4 (FC) + \beta_5 (HM) + \beta_6 (HB) + \beta_7 (IQ) + \varepsilon$
Note:
BI= Behavioural Intention,
PE= Performance Expectancy,
EE= Effort Expectancy,
SI= Social Influence,
FC= Facilitating Conditions,
HM= Hedonic Motivation,
HB= Habit,
IQ= Information Quality,
$\beta_0$ = Intercept/ Constant,
$\beta_{1-7}$ = Slope Coefficients,
$\varepsilon$ = Error Term.

Source: Developed for the research

Additionally, the tolerance value should be at least 0.10 and the variance inflation factor (VIF) value should be at most 10 so that there will be no multicollinearity issue (Hair et al. as cited in Gorondutse & Hilman, 2014).

### **3.8 Conclusion**

Overall, this chapter has described about the methodology of the study. Next chapter would discuss about the results of the data analysis.

## **CHAPTER 4: DATA ANALYSIS**

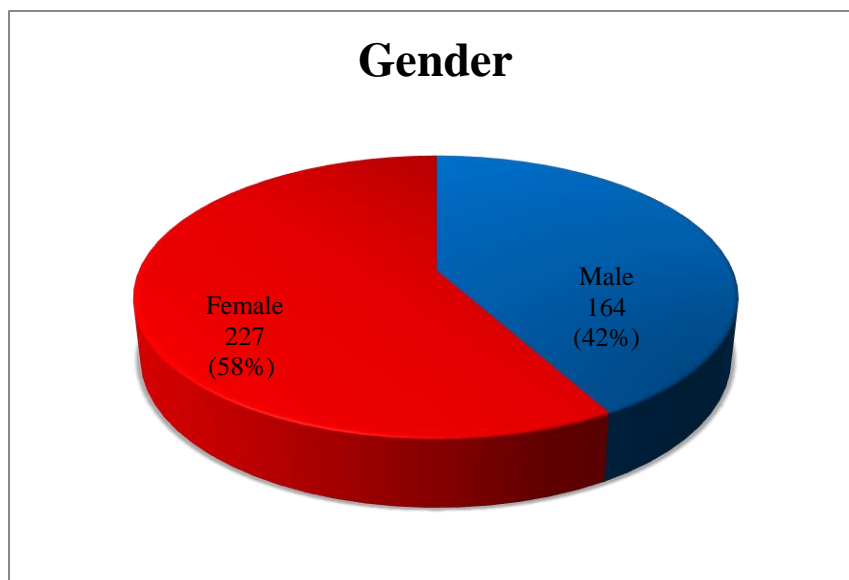
### **4.0 Introduction**

This chapter illustrates the result of data obtained from target respondents and analysed by SAS Enterprise Guide 5.1. The following section discusses about the results of descriptive analysis, scale measurement, and inferential analysis.

### **4.1 Descriptive Analysis**

#### **4.1.1 Demographic Profile of the Respondents**

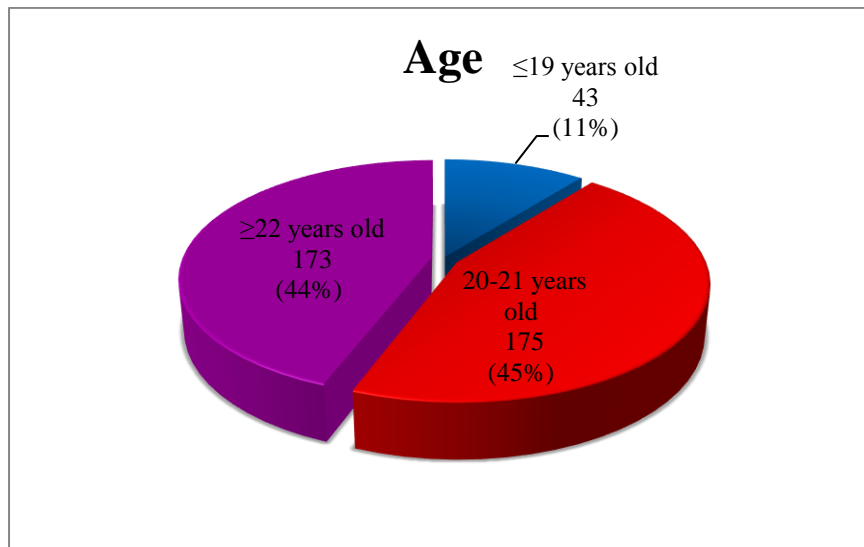
Figure 4.1: Gender of Respondents



Source: Developed for the research

As per Figure 4.1, only 164 male students (42%) participated in the survey whereas 227 respondents were female (58%).

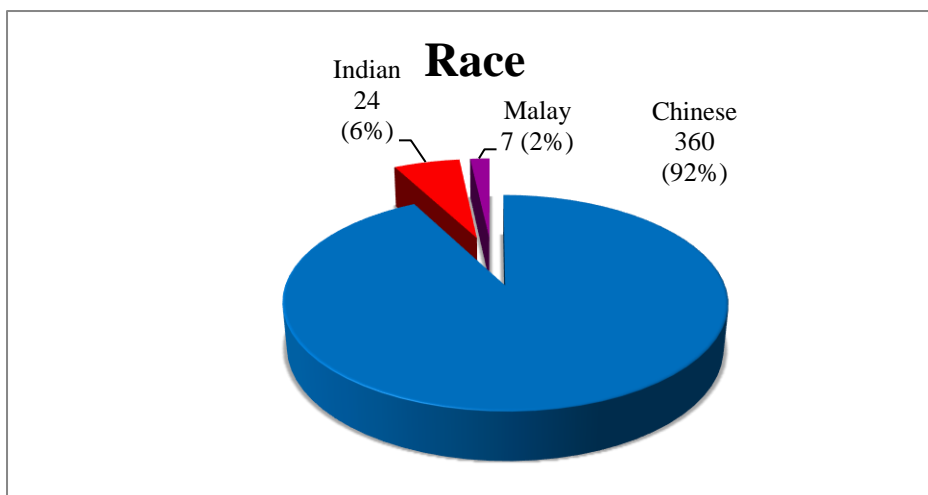
Figure 4.2: Age of Respondents



Source: Developed for the research

Figure 4.2 depicts the fact that undergraduates at the age of 19 or below accounted for only 11% (43). Nonetheless, 175 participants (45%) aged 20 to 21 years old and 173 respondents (44%) aged at least 22 years old.

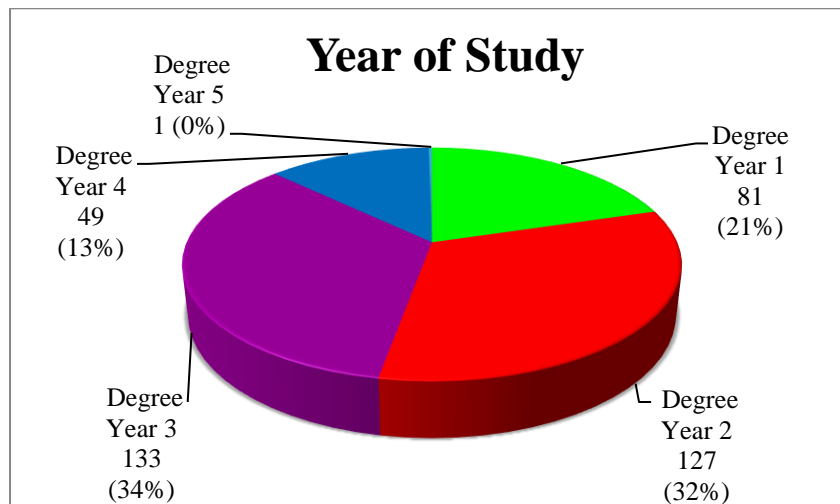
Figure 4.3: Race of Respondents



Source: Developed for the research

Figure 4.3 illustrates that 360 (92%) Chinese undergraduates constituted the largest proportion of respondents in this study. Nevertheless, Indian and Malay participants were as low as 24 (6%) and 7 (2%) respectively.

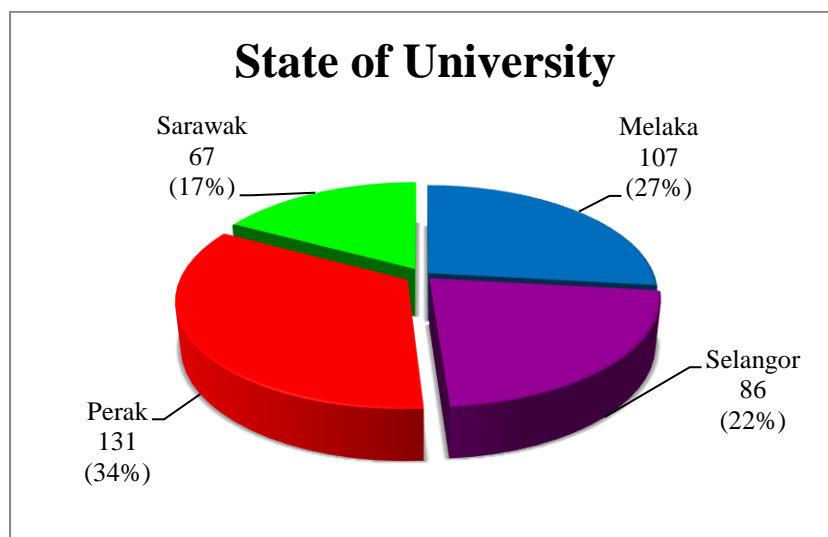
Figure 4.4: Year of Study of Respondents



Source: Developed for the research

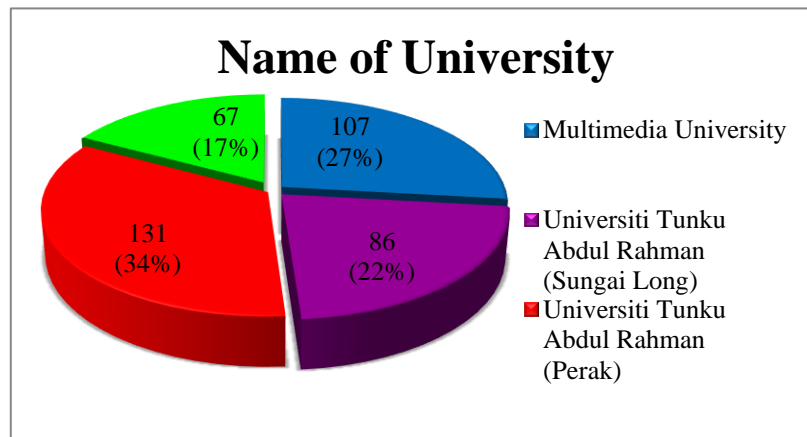
As demonstrated in Figure 4.4, Year 1 students amounted to barely 81 (21%). Year 2 and Year 3 respondents shared the similar proportions, i.e. 127 (32%) and 133 (34%) separately. 49 Year 4 students accounted for merely 13% and only one Year 5 undergraduate contributed to data analysis.

Figure 4.5: State of University of Respondents



Source: Developed for the research

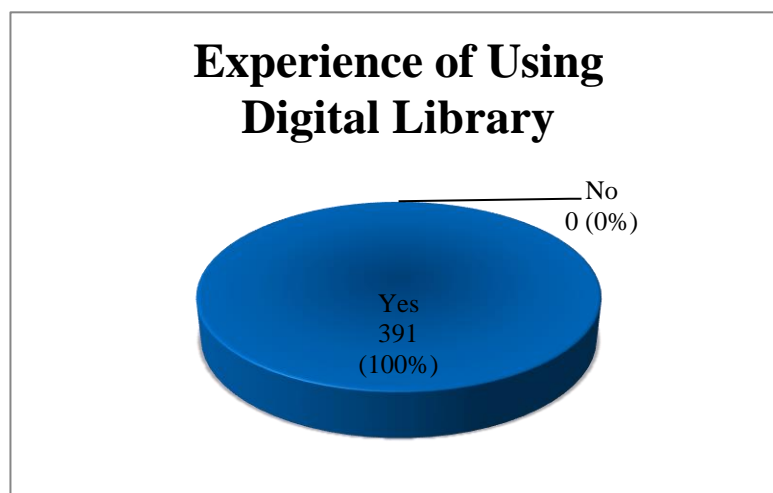
Figure 4.6: Name of University of Respondents



Source: Developed for the research

Figure 4.5 and Figure 4.6 point that 131 (34%) respondents were Universiti Tunku Abdul Rahman, Perak students, followed by Multimedia University, Melaka (107 or 27%), Universiti Tunku Abdul Rahman, Sungai Long (86 or 22%), and Curtin University, Sarawak (67 or 17%) undergraduates.

Figure 4.7: Experience of Respondents in Using Digital Library

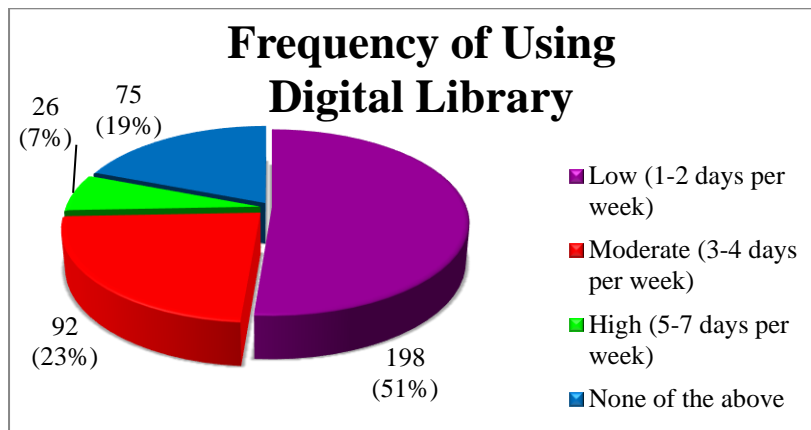


Source: Developed for the research

Judging by Figure 4.7, all the 391 respondents had come across digital library since those without exposure to the digital library were already prohibited from data processing in the first place.



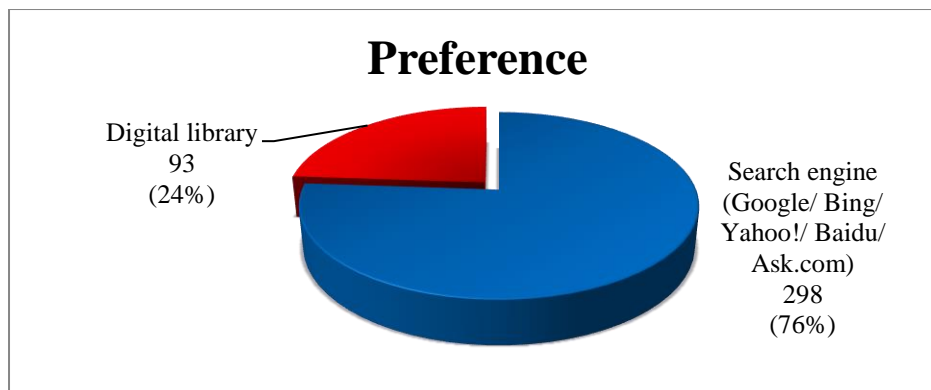
**Figure 4.8: Frequency of Respondents in Using Digital Library**



Source: Developed for the research

In the light of Figure 4.8, a multitude of undergraduates (198 or 51%) had low usage of digital library. 92 (23%) students utilized the digital library moderately. 75 (19%) of them opted for “none of the above”, implying that they had either never employed the digital library or did not use it on a weekly basis. Concernedly, there were only 26 (7%) respondents who applied the digital library 5 to 7 days a week.

**Figure 4.9: Preferred Means of Students in Doing Assignment or Research**



Source: Developed for the research

In line with the problem statement, Figure 4.9 manifests that most of the undergraduates (298 or 76%) preferred to make use of search engine rather than digital library for assignment or research purpose.

### 4.1.2 Central Tendencies Measurement of Constructs

Table 4.1: Mean, Standard Deviation, and Mode of Variables

Variable	Item	Mean	Standard Deviation	Mode
Performance Expectancy (PE)	PE1	3.7544757	0.6801766	4.0000000
	PE2	3.6624041	0.7670077	4.0000000
	PE3	3.7519182	0.7389113	4.0000000
	PE4	3.7033248	0.7537695	4.0000000
	PE5	3.6854220	0.7684598	4.0000000
Effort Expectancy (EE)	EE1	3.8132992	0.8673136	4.0000000
	EE2	3.6598465	0.9026451	4.0000000
	EE3	3.4398977	0.9006231	4.0000000
	EE4	3.7570332	0.8100620	4.0000000
	EE5	3.3657289	0.8867989	3.0000000
Social Influence (SI)	SI1	3.1381074	0.8690434	3.0000000
	SI2	3.3171355	0.8112592	3.0000000
	SI3	3.2710997	0.9132408	4.0000000
	SI4	3.8337596	0.7847821	4.0000000
	SI5	3.8618926	0.7206518	4.0000000
Facilitating Conditions (FC)	FC1	3.7186701	0.7630131	4.0000000
	FC2	3.9283887	0.7302878	4.0000000
	FC3	3.9462916	0.8410496	4.0000000
	FC4	3.6214834	0.7612061	4.0000000
	FC5	3.4475703	0.8269114	3.0000000
Hedonic Motivation (HM)	HM1	3.7468031	0.8562493	4.0000000
	HM2	3.6240409	0.8438830	4.0000000
	HM3	3.5396419	0.8550537	4.0000000
	HM4	3.5166240	0.8406986	4.0000000
	HM5	3.5626598	0.8656031	4.0000000
Habit (HB)	HB1	2.9565217	0.8919309	3.0000000
	HB2	3.0537084	0.8797904	3.0000000

	HB3	2.9437340	0.8897740	3.0000000
	HB4	3.2634271	0.8884833	3.0000000
	HB5	2.9693095	0.9109473	3.0000000
Information Quality (IQ)	IQ1	3.6445013	0.7672556	4.0000000
	IQ2	3.7468031	0.7301800	4.0000000
	IQ3	3.5882353	0.7624284	4.0000000
	IQ4	3.6828645	0.7522193	4.0000000
	IQ5	3.8900256	0.6798776	4.0000000
Behavioural Intention (BI)	BI1	3.6982097	0.7132244	4.0000000
	BI2	3.7314578	0.7175512	4.0000000
	BI3	3.4015345	0.7509978	3.0000000
	BI4	3.3324808	0.7791802	3.0000000
	BI5	3.4961637	0.7905601	4.0000000
	BI6	3.7084399	0.7725452	4.0000000
	BI7	3.6751918	0.8347414	4.0000000

Source: Constructed for the research

Based on Table 4.1, means of constructs fell in the range between 2.9437340 (HB3) and 3.9462916 (FC3). Generally, almost all the means exceeded 3. Besides, mode values were either 3.0000000 or 4.0000000. Thus, respondents mostly expressed neutral opinions or concurred to the questions incorporated excluding HB1, HB3, and HB5.

Next, standard deviations were between 0.6801766 (PE1) and 0.9132408 (SI3), indicating that the respondents had similar viewpoints with each other.

## 4.2 Scale Measurement

### 4.2.1 Reliability Analysis

Table 4.2: Reliability Statistics for Pilot Test and Full Test

Variable	Number of Items	Cronbach's Alpha (Pilot Test)	Cronbach's Alpha (Full Test)
Performance Expectancy	5	0.799310	0.846398
Effort Expectancy	5	0.858679	0.855003
Social Influence	5	0.752313	0.728054
Facilitating Conditions	5	0.835784	0.736080
Hedonic Motivation	5	0.851593	0.899478
Habit	5	0.935408	0.874472
Information Quality	5	0.853650	0.799980
Behavioural Intention	7	0.885423	0.845220

Source: Constructed for the research

Table 4.2 shows the results of the reliability analysis for each variable in both the pilot and full tests. For pilot test, the range of Cronbach's Alpha of the variables lied between 0.752313 and 0.935408. In the full test, hedonic motivation achieved the highest score of 0.899478 whereas social influence obtained the lowest score of 0.728054 while the scores for other variables are arranged in order as follows: FC (0.736080), IQ (0.799980), BI (0.845220), PE (0.846398), EE (0.855003), and HB (0.874472). Generally, all variables analysed in this research were reliable as they reached a score of over 0.70 which met the minimum criteria of Cronbach's Alpha generally accepted by researchers at large (Hair et al., 2010).

## 4.2.2 Normality Analysis

Table 4.3: Summary of Normality Test

<b>Variables</b>	<b>Items</b>	<b>Skewness</b>	<b>Kurtosis</b>
Performance Expectancy (PE)	PE1	-0.3383666	0.48951695
	PE2	-0.3688856	0.23303074
	PE3	-0.3357275	-0.0120318
	PE4	-0.4247044	0.39844099
	PE5	-0.2128596	-0.0868086
Effort Expectancy (EE)	EE1	-0.4824851	-0.1059832
	EE2	-0.3902138	-0.3024085
	EE3	-0.3484017	0.07898048
	EE4	-0.6053507	0.63919128
	EE5	-0.1649552	-0.2816119
Social Influence (SI)	SI1	0.24713138	-0.095234
	SI2	0.08363489	-0.5274156
	SI3	-0.4410024	-0.0966263
	SI4	-0.6580795	0.82655409
	SI5	-0.2826985	-0.0497313
Facilitating Conditions (FC)	FC1	-0.5202106	0.47089224
	FC2	-0.4444975	0.2024072
	FC3	-1.0418225	1.99625914
	FC4	-0.5035979	0.67786179
	FC5	-0.2831666	0.18459834
Hedonic Motivation (HM)	HM1	-0.5971835	0.42622897
	HM2	-0.4072988	0.09246553
	HM3	-0.5691781	0.53106619
	HM4	-0.3518754	0.32523572
	HM5	-0.2658536	-0.0348045

Habit (HB)	HB1	0.04177366	-0.2687998
	HB2	-0.0594182	-0.2541178
	HB3	0.17630429	-0.1693084
	HB4	-0.1890569	-0.235554
	HB5	0.04026068	-0.3020978
Information Quality (IQ)	IQ1	-0.5625169	0.5419367
	IQ2	-0.5607917	0.76554772
	IQ3	-0.3003786	0.32154331
	IQ4	-0.2396462	0.20284381
	IQ5	-0.2542684	0.07497283
Behavioural Intention (BI)	BI1	-0.3384018	0.2857649
	BI2	-0.3463957	0.53968769
	BI3	0.06524979	-0.1186513
	BI4	0.22586613	0.05002107
	BI5	-0.0655668	-0.2685942
	BI6	-0.5182614	0.40027672
	BI7	-0.4200733	0.20242341

Source: Constructed for the research

Table 4.3 presents the coefficients of skewness and kurtosis for every item of each variable. Skewness values ranged between -1.0418225 and +0.24713138 whereas kurtosis values ranged between -0.5274156 and +1.99625914. As the skewness values were all within  $\pm 3$  and kurtosis values were all within  $\pm 10$ , data were then normally distributed (Kline as cited in Lee, 2008).

## 4.3 Inferential Analysis

### 4.3.1 Pearson's Correlation Coefficient Analysis

Table 4.4: Pearson's Correlation

Pearson Correlation Coefficients, N = 391								
Variable	PE	EE	SI	FC	HM	HB	IQ	BI
<b>PE</b>	1							
<b>Sig.</b>								
<b>EE</b>	0.40265	1						
<b>Sig.</b>	<.0001							
<b>SI</b>	0.29419	0.29330	1					
<b>Sig.</b>	<.0001	<.0001						
<b>FC</b>	0.28851	0.40823	0.40435	1				
<b>Sig.</b>	<.0001	<.0001	<.0001					
<b>HM</b>	0.31025	0.33768	0.25648	0.31377	1			
<b>Sig.</b>	<.0001	<.0001	<.0001	<.0001				
<b>HB</b>	0.38732	0.41335	0.23814	0.27939	0.38004	1		
<b>Sig.</b>	<.0001	<.0001	<.0001	<.0001	<.0001			
<b>IQ</b>	0.40106	0.35561	0.34469	0.42675	0.34614	0.36769	1	
<b>Sig.</b>	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		
<b>BI</b>	0.48488	0.46365	0.40566	0.45894	0.50340	0.56915	0.5306	1
<b>Sig.</b>	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	9 <.000 1	

Source: Developed for the research

The result of the Pearson's Correlation analysis has been presented in Table 4.4. According to the findings, correlation values ranged from 0.40566 to 0.56915, indicating that all the independent variables were positively correlated with BI. Among these variables, HB had the most significant relationship with BI.

Among the relationships between independent variables, the association between FC and IQ was the strongest ( $r = 0.42675$ ) in this research. Meanwhile, SI and HB had the weakest correlation of 0.23814. Since the correlation coefficient for all variables were below 0.90, multicollinearity problem did not exist (Hair et al., 2010). In conclusion, all independent variables were significantly correlated with dependent variable (BI) due to the fact that all variables showed p-values below the level of 0.05.

### 4.3.2 Multiple Linear Regression Analysis

Table 4.5: Model Summary

Root MSE	0.36869
Dependent Mean	3.57764
Coefficient Variance	10.30544
R-Square	0.5618
Adj R-Square	0.5538

Source: Constructed for the research

By referring to Table 4.5,  $R^2$  is 0.5618, indicating that 56.18% of the undergraduates' behavioural intention toward digital library could be explained by the seven independent variables (PE, EE, SI, FC, HM, HB, and IQ) in the research model. The remaining 43.82% may be explained by the other factors that are not incorporated in the research.

Table 4.6: Analysis of Variance

Source	Degree of Freedom	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	66.75910	9.53701	70.16	<.0001
Error	383	52.06255	0.13593		
Corrected Total	390	118.82165			

Source: Developed for the research



Table 4.6 presents the Analysis of Variance table. It shows that the F value of 70.16 was significant as the p-value was less than 0.05. Therefore, the research model is considered fit to this study, meaning that at least one of the seven independent variables had significant relationship with the dependent variable (Rull, Wagner, & Gillespie, 2015).

Table 4.7: Summary of Multiple Linear Regressions Test

Variables	Unstandardized coefficients		T Value	Sig. (Pr > t)	Tolerance	Variance Inflation Factor
	Beta	Std. Error				
Intercept	0.14880	0.17160	0.87	0.3864	-	0
PE	0.13510	0.03779	3.58	0.0004	0.71505	1.39851
EE	0.06016	0.03257	1.85	0.0655	0.67924	1.47224
SI	0.10756	0.03727	2.89	0.0041	0.77451	1.29114
FC	0.12435	0.04119	3.02	0.0027	0.68407	1.46185
HM	0.15046	0.02969	5.07	<.0001	0.76309	1.31046
HB	0.21149	0.03046	6.94	<.0001	0.70899	1.41046
IQ	0.18536	0.04121	4.50	<.0001	0.67637	1.47847

Source: Developed for the research

From Table 4.7, it shows that beta values of the independent variables in order of significance are 0.21149 (HB), 0.18536 (IQ), 0.15046 (HM), 0.13510 (PE), 0.12435 (FC), 0.10756 (SI), and 0.06016 (EE) respectively. Hence, all independent variables were positively related to behavioural intention. Next, the p-values of the seven independent variables were less than 0.05 excluding effort expectancy (0.0655). Thus, all the determinants except for effort expectancy would significantly affect behavioural intention. Additionally, six out of seven hypotheses were supported. Ultimately, an MLR equation can be constructed as:

$$BI = 0.14880 + 0.13510 PE + 0.06016 EE + 0.10756 SI + 0.12435 FC + 0.15046 HM + 0.21149 HB + 0.18536 IQ$$

Note:
BI= Behavioural Intention,
PE= Performance Expectancy,
EE= Effort Expectancy,
SI= Social Influence,
FC= Facilitating Conditions,
HM= Hedonic Motivation,
HB= Habit,
IQ= Information Quality.

The equation above indicates that all independent variables were positively related to the dependent variable. Among them, habit had the most significant impact on behavioural intention as every increase in habit will increase 0.21149 unit of behavioural intention while holding other variables constant. However, effort expectancy had no significant influence on behavioural intention.

Next, since tolerance values were more than 0.10 and VIF values were less than 10, no multicollinearity was prevailing in this research (Hair et al. as cited in Gorondutse & Hilman, 2014).

## 4.4 Conclusion

This chapter provides the results pattern and brief interpretation of the results. A detailed discussion on major findings, implications, limitations, and recommendations will be outlined in chapter 5.

## **CHAPTER 5: DISCUSSIONS, IMPLICATIONS, AND**

### **CONCLUSION**

#### **5.0 Introduction**

This chapter recaps and discusses the results from previous section. It also includes implications, limitations, and further suggestions.

#### **5.1 Summary of Statistical Analysis**

##### **5.1.1 Summary of Descriptive Analysis**

In this research, female respondents (58%) were more than male respondents (42%) by 16%. 89% of undergraduates were at least 20 years old. Owing to the enormous enrolment of Chinese students in the Malaysian private universities, Chinese undergraduates (92%) were the major group in this research (Raman & Sua, 2010). 66% of valid samples were collected from degree Year 2 (32%) and Year 3 undergraduates (34%).

56% of respondents were Universiti Tunku Abdul Rahman students, of which 22% from Sungai Long campus and 34% from Perak campus. This is because researchers were unable to access more samples from Multimedia University and Curtin University as the data collection period had coincided with semester break, midterm, and assignment submission week respectively. However, as the universities chosen have the largest population, the results could still be representative (refer to appendix 5.1). Next, all respondents had experiences of using digital library but majority

(51%) had low usage frequency. 76% of users expressed that search engines would be more desirable consideration.

### 5.1.2 Summary of Scale Measurement

All the constructs had scored Cronbach's Alpha above 0.70 and thus were reliable. Normality assumption was also fulfilled as all the items reported skewness values within  $\pm 3$  and kurtosis values within  $\pm 10$ .

### 5.1.3 Summary of Inferential Analysis

Table 5.1: Summary of Inferential Analysis

Hypotheses	Pearson Correlation	Multiple Linear Regression (R-Square = 0.5618)		
	Result	Beta	P-value	Hypothesis
H1: There is a positive relationship between performance expectancy and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.	0.48488	0.13510	0.0004	Supported
H2: There is a positive relationship between effort expectancy and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.	0.46365	0.06016	0.0655	Not Supported

H3: There is a positive relationship between social influence and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.	0.40566	0.10756	0.0041	Supported
H4: There is a positive relationship between facilitating conditions and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.	0.45894	0.12435	0.0027	Supported
H5: There is a positive relationship between hedonic motivation and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.	0.50340	0.15046	<.0001	Supported
H6: There is a positive relationship between habit and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.	0.56915	0.21149	<.0001	Supported
H7: There is a positive relationship between information quality and behavioural intention to adopt digital library among undergraduates in private universities in Malaysia.	0.53069	0.18536	<.0001	Supported

Source: Constructed for the research

From Table 5.1, result of Pearson's Correlation reflects that all independent variables were positively associated with the dependent variable. Additionally, Multiple Linear Regression result supported that all independent variables were positively related with the dependent variable, yet effort expectancy was discovered to be insignificant. Therefore, all hypotheses were supported except effort expectancy. By analysing the beta values, habit was validated as the most effective determinant whereas effort expectancy was insignificant in this research.

## **5.2 Discussions of Major Findings**

### **5.2.1 Performance Expectancy and Behavioural Intention**

Compatible to the findings of Alharbi and Drew (2014), Bellaaj, Zekri, and Albugami (2015), and Pardamean and Susanto (2012), statistical analysis revealed that performance expectancy had remarkably positive impact on behavioural intention.

The rationale behind this is that undergraduates' perceive digital library is beneficial to make them become effective, productive, and efficient in their academic works. Besides, they believe that digital library will ease their tasks and ameliorates their performance. This connotes that undergraduates with greater performance expectancy have greater likelihood to adopt digital library. Those undergraduates are inclined to employ digital library due to their acknowledgment of digital library's aptitude to boost their upshot in assignment or research (Lwoga & Komba, 2015).

### **5.2.2 Effort Expectancy and Behavioural Intention**

Astonishingly, the positive association between effort expectancy and behavioural intention was inconsequential. This conclusion was matched with extant papers published by Dečman (2015), Imtiaz and Maarop (2014), Jambulingam (2013), Joo, Joung, Shin, Lim, and Choi (2014), Raman, Don, Khalid, and Rizuan (2014), and Singeh, Abrizah, and Abdul Karim (2013) which also discovered the insignificant effect of effort expectancy on behavioural intention. As elucidated by Dečman (2015), effort expectancy had little power to affect behavioural intention as digital library is modern, web-based, and user-friendly.

Additionally, this study upholds Roberts who asserted that the digital natives like undergraduates who were born and raised with cutting edge technology are so well-versed in computers and Internet (as cited in Jambulingam, 2013). Thus, digital library that requires the use of computers and Internet may just be something ordinary for undergraduates.

Additionally, Mukisa and Ochieng (2013) predicated that the efforts inescapable to learn and obtain skills on using digital library would not be a concern for undergraduates to employ the system. As long as undergraduates found that the digital library is advantageous to them, then they will devote to master the digital library.

### **5.2.3 Social Influence and Behavioural Intention**

In line with Al-Sultan (2015), Chang et al. (2015), Dečman (2015), Farahat (2012), and Jawad and Hassan (2015), social influence had a positive and significant association with behavioural intention to use digital library.

Contradictorily, Evans and Le Roux (2016) revealed that social influence seemed to have the weakest positive relationship with students' behavioural intention to adopt e-learning resources. However, it showed different result in this research. This may be due to the important people around target respondents provide their opinions regarding the benefits of using digital library. Indirectly, this will motivate users to use digital library (Oh & Yoon, 2014).

#### **5.2.4 Facilitating Conditions and Behavioural Intention**

Consistent with the studies of Gawande (2015), Kocaleva, Stojanovic, and Zdravev (2015), and Uğur, Koç, and Koç (2016), facilitating conditions was found to be positively influencing the behavioural intention to adopt digital library.

Facilitating conditions can act as motivating factor when university supports the use of the digital library system by providing necessary facilities such as computer, internet access, and systematic library websites of which learning resources are available. The significant positive result indicated that the students perceived there was organizational and technical support when using the digital library. This may be because they have resources to assist them in using the digital library, possess relevant knowledge to operate and get assistance from the specific personnel (Abdullah et al., 2014).

#### **5.2.5 Hedonic Motivation and Behavioural Intention**

In agreement with the results of Yang (2013), Nguyen et al. (2014), Kang et al. (2014), and Nguyen, Nguyen, Pham, and Misra (2014), hedonic motivation was found to have significant positive association with the



behavioural intention to adopt digital library. Digital library seemed to have the ability to provide fun, entertainment, and enjoyment to the students.

However, this research's result is contradicted with Ain et al. (2015), who suggested that hedonic value of learning management system was insignificant towards students' intention to adopt it. This is because students perceived learning management system as an academic-based system which did not provide any pleasure to them while using it. From the result obtained, it can be inferred that, despite of the fact that digital library is more course-related, the students believe that using digital library is more fun compared to the traditional library because they are able to access to the electronic books, journals, magazines, or academic videos with the accessibility to Internet (Alfaresi & Hone, 2015). For this reason, users' usage intention is driven by the hedonic value obtained from using digital library.

### **5.2.6 Habit and Behavioural Intention**

This research found that habit had significant positive effect on the behavioural intention to adopt digital library. This result is supported by the findings of Nair et al. (2015), Kang et al. (2014), Nguyen et al. (2014), Lewis et al. (2013), and Liao, To, Liu, Kuo, and Chuang (2011). However, the finding of Mtebe et al. (2016) showed a contradictory result which revealed that habit had significantly negative influence on behavioural intention. This is because users perceived that habit is built through experience which users should at least use the technology for some time. It is impossible for users to cultivate a habit in using new technology especially when users are not familiar with it.

In this study, habit had the strongest positive connection with behavioural intention to adopt digital library. This result is in line with Escobar-

Rodríguez et al. (2014) who proved that habit is the strongest factor in influencing behavioural intention. This may be due to the familiarity of target respondents towards digital library as most of the undergraduates will use digital library for coursework and study purpose (Baro, Onyenania, & Osaheni, 2010). Hence, this increases the undergraduates' acceptance of digital library during the learning process.

### **5.2.7 Information Quality and Behavioural Intention**

Information quality was found to have significant positive association with users' behavioural intention to adopt digital library. This result is coincident with the result of Wang and Chiu (2011) that showed information quality had significant positive influence on users' intention to adopt e-learning system. However, it is contradictory with the result of Chiu et al. (2016) that showed information quality had no significant positive influence on intention to use cloud e-bookcase. This indicates that there was no positive linkage between information accuracy and comprehensibility with user satisfaction and use intention owing to the fact that users perceive information quality was not a factor that can influence their satisfaction and intention to use the system.

The result is consistent with Etinger et al. (2014) who revealed that information quality and users' intention to adopt e-library had positive relationship. The important drivers of users' satisfaction and intention to use such as sufficiency and usefulness of content in e-library enable students to improve their skills and capabilities in completing their assignments. Thus, an appropriate attention should be directed to the information quality.

This result is also congruent with the past study that showed a positive relationship between information quality and behavioural intention in using e-learning among students in public higher education (Ramayah,

Ahmad, & Lo, 2010). This result indicates that the e-learning system which provides sufficient and updated information will absolutely enhance the students' intention to use e-learning systems in Malaysia.

## **5.3 Implications of the Study**

### **5.3.1 Theoretical Implications**

To begin with, this research successfully reinforced that the inspiration to ameliorate UTAUT2 by synthesis of ISSM, which presumably has never been done, was not in vain. The  $R^2$  value was 56.18%, stressing the fact that more than half of the variances in undergraduates' behavioural intention could be explained by the independent variables incorporated in this study. Also, no multicollinearity was detected despite of the merge of newly added independent variable which was information quality with UTAUT2. Besides, as this paper probed into private universities which, to the best of researchers' knowledge, appear to be a rather newly investigated target in digital library study, it has opened the door for other academicians to examine it further afterwards. All in all, the current study was so avant-garde in different aspects, be it the theories combined, mix of variables, or unit of analysis.

### **5.3.2 Managerial Implications**

The findings are beneficial to Malaysian private universities. Only effort expectancy was irrelevant while all the other six independent variables were notable determinants that positively engendered undergraduates' behavioural intention to adopt digital library.

Firstly, habit, being the most vital determinant of behavioural intention, should be the foremost consideration of universities. Nonetheless, it may be implausible to break the habitual behaviour of undergraduates in reality. Thus, rules and regulations ensuring consistent utilization of digital library could be implemented in order to cultivate undergraduates' habit and ultimately their behavioural intention of employing the system as supplemental tool for academic tasks.

Next, information quality was the second pivotal driver to foster behavioural intention. Information furnished should therefore be always rich, accurate, up-to-date, high quality, and useful to the undergraduates. For instance, universities could subscribe to more commonly used and sought-after databases and purchase greater number of articles particularly those published in recent years. Alternatively, the universities may also collaborate with other institutes that enjoy relatively abundant databases to share the information sources.

The third significant antecedent of behavioural intention was hedonic motivation. To exhilarate undergraduates' browsing experiences, universities could fuse several multimedia contents namely animations, thumbnails, pictures, audios, and video clips into the digital library to diminish its monotonousness.

Following that, performance expectancy should be the fourth factor to ponder. To improve undergraduates' perception on performance expectancy, more assignments requiring citing contemporary scholarly articles from trustworthy sources should be designated by the academic staff. As a vast amount of articles are only available for preview online, undergraduates may eventually realize that digital library is the only tool that empowers them the access to download and view full text of articles without charge.

In order of importance, the effect of facilitating conditions on behavioural intention ranked the fifth. As digital library is approachable anywhere via Internet, universities should not merely ensure that librarians are available for assistance around the physical library, but also cater the needs of students who access the digital library outside the campus. For example, undergraduates could be provided with the support to inquire immediately at their convenience by integrating chat function into the digital library or by the means of social media and messaging applications.

Next, social influence had noteworthy but the most trivial impact on behavioural intention. So, universities could, for instance, start by promoting digital library to senior undergraduates and inviting academic staff to recommend it to their students. Once they have grasped an understanding on the merit that digital library could yield, the seniors may then introduce the digital library to juniors and the undergraduates from one class may also suggest it to those from another group.

Finally, as behavioural intention would not be influenced by effort expectancy considerably, universities may divert their attention from this issue and just emphasize on the six outstanding variables identified earlier.

## **5.4 Limitations and Recommendations**

No research could be flawless. Several inevitable imperfections are still prevailing in the current study.

Firstly, the use of cross-sectional study generated only a snapshot of how things were at a certain time (Siegel, 2011). It did not take into consideration that the experiences, preferences, and opinions of undergraduates may evolve over time. Thus, longitudinal approach that collects the data from and analyses the changes of respondents over a long-term may be adopted thereafter (Caruana, Roman, Hernández-Sánchez, & Solli, 2015). For instance, future researchers may

investigate in-depth whether students' behavioural intention to adopt digital library will differ before and after they embark into research or final year project which requires them to intensively seek for electronic scholarly information.

Secondly, collecting primary data by the means of self-administered questionnaires has been contentious because, for example, the respondents may not pore over the questions attentively and may fill in the questionnaires haphazardly (Hughes, 2012). Therefore, interviewer-administered questionnaires may be a robust alternative if time and budget were not an apprehension of future academicians. The practice of such *modus operandi* will not only ensure more accurate and complete recording of responses, but also the feasibility for researchers to elucidate thoroughly the survey questions to the respondents (MacDonald, 2012).

Thirdly, the sampling locations were restricted to only three private universities in four states of Malaysia. The choice of merely three tertiary educational institutions may be inadequate as there were a total of 47 private academies in Malaysia being granted university status by the time of completion of this research (refer to Appendix 1.1). Besides, this paper covered only 4 out of 13 states and 3 federal territories in Malaysia (Naing et al., 2016) and Malaysia is just one of the 195 commonwealths in the world (U.S. Department of State, 2016). All of them point to the same concern in which the findings may be subject to limited generalizability in the case of other private universities and states in Malaysia as well as in the case of other nations. Consequently, the involvement of more private institutes, prefectures, and countries in future research is advised depending on the subject of interest.

Last but not least, the samples were predominantly Chinese in this study. As postulated by Rahman, Jamaludin, and Mahmud (2011a), ethnic difference does matter in measuring behavioural intention to employ digital library. Accordingly, more undergraduates of ethnicity other than Chinese could be engaged by future scholars to diminish the racial variation.

Despite of the loopholes highlighted, all the drawbacks just allow room for improvements and serve as a foundation for further research and the contributions of this empirical work are nevertheless indubitable.

## **5.5 Conclusion**

This research's findings show that all independent variables excluding effort expectancy had significant positive relationship with behavioural intention to adopt digital library among private universities' undergraduates. This study enhances the understanding of management board in private universities regarding undergraduates' intention to use digital library. Therefore, management board can make improvement in right direction which can successfully increase the undergraduates' acceptance level towards digital library and reduce the underutilisation problem. In conclusion, modified UTAUT2 can be considered as an appropriate model in predicting the undergraduates' behavioural intention to use digital library.

## REFERENCES

- Abdullah, M. R. T. L., Siraj, S., & Lim, L. Y. (2014). Engineering students' acceptance of mlearning in formal english language learning: Application of UTAUT model. *Advances in Educational Technologies*, 150-156. Retrieved from <http://www.inase.org/library/2014/santorini/bypaper/EDU/EDU-26.pdf>
- Abdullateef, A. O., & Allumi, N. A. (2014). Determinants of Moodle 1.9 online learning-zone services adoption. *Journal of Management Information System and E-commerce*, 1(1), 29-40.
- Abu-Al-Aish, A. A., & Love, S. (2013). Factors influencing students' acceptance of m-learning: An investigation in higher education. *The International Review of Research in Open and Distance Learning*, 14(5), 82-107.
- Agboola, I. O., & Bamigboye, O. B. (2011). Students' level of study and user of library resources in Nigerian universities: A comparative study. *Library Philisophy and Practice*. Retrieved from <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1559&context=libphilprac>
- Ain, N. U., Kaur, K., & Waheed, M. (2015). The influence of learning value on learning management system use: An extension of UTAUT2. *Information Development*, 1-16. doi:10.1177/0266666915597546
- Alawamreh, A. R., & Elias, N. F. (2015). Examining the effectiveness of using web-based learning for gifted students: Jordan as case study. *Journal of Theoretical and Applied Information Technology*, 76(2), 160-169.
- Al-Debei, M. M., Jalal, D., & Al-Lozi, E. (2013). Measuring web portals success: a respecification and validation of the DeLone and McLean information systems success model. *International Journal of Business Information Systems*, 14(1), 96. doi:10.1504/ijbis.2013.055555
- Alfaresi, S. H., & Hone, K. (2015). The intention to use mobile digital library technology: A focus group study in the United Arab Emirates. *International Journal of Mobile Human Computer Interaction*, 7(2), 23-42. doi:10.4018/ijmhci.2015040102



- Al-Gahtani, S. S. (2016). Empirical investigation of e-learning acceptance and assimilation: A structural equation model. *Applied Computing and Informatics*, 12(1), 27-50. doi:10.1016/j.aci.2014.09.001
- Alharbi, S., & Drew, S. (2014). Mobile learning-system usage: Scale development and empirical tests. *International Journal of Advanced Research in Artificial Intelligence*, 3(11), 31-47. doi:10.14569/ijarai.2014.031105
- Ali, F., Nair, P. K., & Hussain, K. (2016). An assessment of students' acceptance and usage of computer supported collaborative classrooms in hospitality and tourism schools. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 18, 51-60. doi:10.1016/j.jhlste.2016.03.002
- Al-Sultan, A. T. (2015). Empirical investigation on factors influencing the behavioral intention to use e-library for a private university in Kuwait using statistical approach in a structure equation model (SEM). *Far East Journal of Mathematical Education*, 14(1), 25-48. doi:10.17654/fjmefeb2015\_025\_048
- Alwahaishi, S., & Snasel, V. (2013). Consumers' acceptance and use of information and communications technology: A UTAUT and flow based theoretical model. *Journal of Technology Management & Innovation*, 8(2), 61-73. doi:10.4067/s0718-27242013000200005
- Alzaza, N. S., & Zulkifli, A. N. (2007). Mobile-based library loan service. *Proceedings of the Rural ICT Development Conference*, 1-8. Retrieved from <https://najishukri.files.wordpress.com/2010/05/papermblls.pdf>
- Asia Internet usage and population statistics*. (2016, March 7). Retrieved March 10, 2016, from <http://www.internetworldstats.com/stats3.htm>
- Awwad, M. S., & Al-Majali, S. M. (2015). Electronic library services acceptance and use: An empirical validation of unified theory of acceptance and use of technology. *The Electronic Library*, 33(6), 1100-1120. doi:10.1108/EL-03-2014-0057

- Ayele, A. A., & Sreenivasarao, V. (2013). A case study of acceptance and use of electronic library services in universities based on SO-UTAUT model. *International Journal of Innovative Research in Computer and Communication Engineering*, 1(4), 903-911.
- Badara, M. S., & Saidin, S. Z. (2014). Internal audit effectiveness: Data screening and preliminary analysis. *Asian Social Science*, 10(10), 76-85. doi:10.5539/ass.v10n10p76
- Bagudu, A. A., & Sadiq, H. (2013). Students' Perception of Digital Library Services: A Case Study of International Islamic University, Malaysia. *Library Philosophy and Practice*. Retrieved from <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=2142&context=libphilprac>
- Baptista, G., & Oliveira, T. (2015). Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators. *Computers in Human Behavior*, 50, 418-430. doi:10.1016/j.chb.2015.04.024
- Baro, E. E., Onyenania, G. O., & Osaheni, O. (2010). Information seeking behaviour of undergraduate students in the humanities in three universities in Nigeria. *South African Journal of Libraries and Information Science*, 76(2). doi:10.7553/76-2-74
- Bellaaj, M., Zekri, I., & Albugami, M. (2015). The continued use of e-learning system: An empirical investigation using UTAUT model at the university of Tabuk. *Journal of Theoretical and Applied Information Technology*, 72(3), 464-474.
- Bere, A. (2014). *Exploring determinants for mobile learning user acceptance and use: An application of UTAUT*. Paper presented at 11th International Conference on Information Technology: New Generations. doi:10.1109/ITNG.2014.114
- Bhattacharjee, A. (2012). *Social science research: Principles, methods, and practices*. Retrieved from [http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1002&context=oa\\_textbooks](http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1002&context=oa_textbooks)

- Boateng, R., Mbrokoh, A. S., Boateng, L., Senyo, P. K., & Ansong, E. (2016). Determinants of e-learning adoption among students of developing countries. *The International Journal of Information and Learning Technology*, 33(4). Retrieved from <http://dx.doi.org/10.1108/IJILT-02-2016-0008>
- Boyle, M. P., & Schmierbach, M. (2015). *Applied communication research methods: Getting started as a researcher*. Routledge.
- Caruana, E., Roman, M., Hernández-Sánchez, J., & Solli, P. (2015). Longitudinal studies. *Journal of Thoracic Disease*, 7(11), E537-E540.
- Chang, C. C. (2013). Library mobile applications in university libraries. *Library Hi Tech*, 31(3), 478-492. doi:10.1108/lht-03-2013-0024
- Chang, K. C. (2016). Effect of servicescape on customer behavioral intentions: Moderating roles of service climate and employee engagement. *International Journal of Hospitality Management*, 53, 116-128. doi:10.1016/j.ijhm.2015.12.003
- Chang, S., Lou, S., Cheng, S., & Lin, C. (2015). Exploration of usage behavioral model construction for university library electronic resources. *The Electronic Library*, 33(2), 292-307. doi:10.1108/el-10-2013-0195
- Charles, M. J., & Jaggernauth, S. (2015). An investigation of the influence of teacher variables on pre-training efficacy beliefs. *Caribbean Teaching Scholar*, 5(1), 5-24.
- Chee, J. D. (2015). Pearson's product-moment correlation: Sample analysis. doi:10.13140/RG.2.1.1856.2726
- Chen, C. D., & Cheng, C. J. (2009). Understanding consumer intention in online shopping: a respecification and validation of the DeLone and McLean model. *Behaviour & Information Technology*, 28(4), 335-345. doi:10.1080/01449290701850111
- Chen, Y. H. (2015). Testing the impact of an information literacy course: Undergraduates' perceptions and use of the university libraries' web portal. *Library & Information Science Research*, 37(3), 263-274. doi:10.1016/j.lisr.2015.04.002

- Chen, Y. H., & Chengalur-Smith, I. (2015). Factors influencing students' use of a library Web portal: Applying course-integrated information literacy instruction as an intervention. *The Internet and Higher Education*, 26, 42-55. doi:10.1016/j.iheduc.2015.04.005
- Cheng, Y. M. (2014). Why do users intend to continue using the digital library? An integrated perspective. *Aslib Journal of Information Management*, 66(6), 640-662. doi:10.1108/ajim-05-2013-0042
- Chepchirchir, J., & Leting, M. (2015). Effects of brand quality, brand prestige on brand purchase intention of mobile phone brands: Empirical assessment from Kenya. *International Journal of Management Science and Business Administration*, 1(11), 7-14. doi:10.18775/ijmsba.1849-5664-5419.2014.111.1001
- Chiu, P., Chao, I., Kao, C., Pu, Y., & Huang, Y. (2016). Implementation and evaluation of mobile e-books in a cloud bookcase using the information system success model. *Library Hi Tech*, 34(2), 207-223. doi:10.1108/lht-12-2015-0113
- Chopra, S., & Rajan, P. (2016). Modeling intermediary satisfaction with mandatory adoption of e-government technologies for food distribution. *Information Technologies & International Development*, 12(1), 15-34.
- Clements, J. A. (2015). Beyond habit: The role of sunk costs on developing automatic IS use behaviors. *Journal of the Southern Association for Information Systems*, 3(1), 17-37. doi:10.3998/jsais.11880084.0003.103
- Cohen, J. F., Bancilhon, J. M., & Jones, M. (2013). South African physicians' acceptance of e-prescribing technology: An empirical test of a modified UTAUT model. *South African Computer Journal*, 50(1), 43-54. doi:10.18489/sacj.v50i1.175
- Consejo Superior de Investigaciones Científicas. (2016). Ranking Web of Repositories. Retrieved June 2, 2016, from <http://repositories.webometrics.info/en/asia/malaysia%20>

- Cooper, D., & Greenaway, M. (2015). Non-probability survey sampling in official statistics (4). Retrieved from Office for National Statistics website:  
<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiY-P6q7KvLAhXCCI4KHZcdCxgQFggdMAA&url=http%3A%2F%2Fwww.ons.gov.uk%2Fons%2Fguide-method%2Fmethod-quality%2Fspecific%2Fgss-methodology-series%2Fons-working-paper-series%2Fmwp3-non-probability-survey-sampling-in-official-statistics.pdf&usg=AFQjCNESPTfV-916vUz6Pps0p9ryti8QoA&sig2=d-oAI2fPCZX0UqkDf2nSRA>
- Creswell, J. W. (2012). Collecting quantitative data. In *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (4th ed., pp. 140-173). Retrieved from <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwiI2In366vLAhWBv44KHdBqDawQFggqMAE&url=https%3A%2F%2Fclass.uoa.gr%2Fmodules%2Fdocument%2Findex.php%3Fcourse%3DPPP630%26download%3D%2F5675d94bTYjI.pdf&usg=AFQjCNF4GoBPWZtNVCddKKgBMYfgUfWsGg&sig2=eX--pHnj6AlkVuOjLvZLKg>
- Dečman, M. (2015). Modeling the acceptance of e-learning in mandatory environments of higher education: The influence of previous education and gender. *Computers in Human Behavior*, 49, 272-281. doi:10.1016/j.chb.2015.03.022
- DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten year update. *Journal of Management Information Systems*, 19(4), 9–30. Retrieved from <http://www.asiaa.sinica.edu.tw/~ccchiang/GILIS/LIS/p9-Delone.pdf>
- DeLone, W. H., & McLean, E. R. (2004). Measuring e-commerce success: Applying the DeLone & McLean information systems success model. *International Journal of Electronic Commerce*, 9(1), 31-47. Retrieved from [https://www.researchgate.net/publication/279894167\\_Measuring\\_e-Commerce\\_Success\\_Applying\\_the\\_DeLone\\_McLean\\_Information\\_Systems\\_Success\\_Model](https://www.researchgate.net/publication/279894167_Measuring_e-Commerce_Success_Applying_the_DeLone_McLean_Information_Systems_Success_Model)
- Department of Higher Education. (2015). *Institusi Pendidikan Tinggi Swasta (IPTS) Malaysia Profile of Private Higher Educational Institution (PHEIs) 2014*. Retrieved from Department of Higher Education, Ministry of Higher Education website:  
[https://drive.google.com/file/d/0B\\_d1Pn\\_kLUU5eENPMzFmQnBwdmM/view?pref=2&pli=1](https://drive.google.com/file/d/0B_d1Pn_kLUU5eENPMzFmQnBwdmM/view?pref=2&pli=1)

- Ding, Y., Guo, F., Zhang, X. F., Qu, Q. X., & Liu, W. L. (2016). Using event related potentials to identify a user's behavioural intention aroused by product form design. *Applied Ergonomics*, 55, 117-123. doi:10.1016/j.apergo.2016.01.018
- Dollah, K. W., & Kadir, R. A. (2010). *Academic Digital Library in Malaysia: A Case Study on the Status of Digital Reference Services*. Paper presented at National Seminar on Information Technology in the Library , Bayview Hotel, Penang, Malaysia. Retrieved from [http://repo.uum.edu.my/559/1/SPEAKER\\_WAN\\_KADIR.pdf](http://repo.uum.edu.my/559/1/SPEAKER_WAN_KADIR.pdf)
- Doyle, J. K. (2014). Face-to-face surveys. In *Wiley StatsRef: Statistics Reference Online*. doi:10.1002/9781118445112.stat06686
- Edelson, D. C., & Gordin, D. N. (1996). Adapting digital libraries for learners. *D-Lib Magazine*, 2(9). doi:10.1045/september96-edelson
- EduSpiral Consultant Services. (2016). *Education advise on choosing the best universities & top colleges in Malaysia & Singapore*. Retrieved June 4, 2016, from <https://eduspiral.com/curtin-university-sarawak-campus/>
- Escobar-Rodriguez, T., & Carvajal-Trujillo, E. (2013). Online drivers of consumer purchase of website airline tickets. *Journal of Air Transport Management*, 32, 58-64. doi:10.1016/j.jairtraman.2013.06.018
- Escobar-Rodríguez, T., Carvajal-Trujillo, E., & Monge-Lozano, P. (2014). Factors that influence the perceived advantages and relevance of Facebook as a learning tool: An extension of the UTAUT. *AJET*, 30(2). doi:10.14742/ajet.585
- Etinger, D., Šehanović, J., & Ribić, A. (2014). Measuring the success of e-library implementation: Students perceptions and use. *The Impact of Migration on Croatian Cultural Diversity*, 957-969. Retrieved February 25, 2016, from <http://www.efos.unios.hr/repec/osi/journal/PDF/InterdisciplinaryManagementResearchX/IMR10a73>
- Evans, N. D., & Le Roux, J. (2016). Modelling the acceptance and use of electronic learning at the University of Zululand. *South African Journal of Libraries and Information Science*, 81(2). doi:10.7553/81-2-1562

- Farahani, E. F., & Kaviani, M. (2011). *Understanding User Acceptance of Digital Library*. Unpublished bachelor's thesis, Jönköping University, Jönköping International Business School, Jönköping, Sweden. Retrieved February 20, 2016, from <http://www.diva-portal.se/smash/get/diva2:461467/FULLTEXT01.pdf>
- Farahat, T. (2012). Applying the technology acceptance model to online learning in the Egyptian Universities. *Procedia - Social and Behavioral Sciences*, 64, 95-104. doi:10.1016/j.sbspro.2012.11.012
- Gawande, V. (2015). Development of blended learning model based on the perceptions of students at higher education institutes in Oman. *International Journal of Computer Applications*, 114(1), 38-45. doi:10.5120/19946-1747
- Gelo, O. C., Pritz, A., & Rieken, B. (2014). *Psychotherapy research: Foundations, process, and outcome*. Springer.
- Gerhart, N., Peak, D. A., & Prybutok, V. R. (2015). Searching for new answers: The application of task-technology fit to e-textbook usage. *Decision Sciences Journal of Innovative Education*, 13(1), 91-111. doi:10.1111/dsji.12056
- Goel, S., Obeng, A., & Rothschild, D. (2016). Non-representative surveys: Fast, cheap, and mostly accurate.
- Gorondutse, A. H., & Hilman, H. (2014). Effect of business social responsibility (BSR) on performance of SMEs: Data screening and preliminary analysis. *Asian Social Science*, 10(8), 103-115. doi:10.5539/ass.v10n8p103
- Gupta, S. (2015). A multiple regression technique in data mining. *International Journal of Computer Applications*, 126(5), 32-34. doi:10.5120/ijca2015906058
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Retrieved from [http://www.docente.unicas.it/useruploads/001223/files/multivariate\\_data\\_analysis\\_\(7th,\\_2009\).pdf](http://www.docente.unicas.it/useruploads/001223/files/multivariate_data_analysis_(7th,_2009).pdf)

- Hazra, A., & Gogtay, N. (2016). Biostatistics and research methodology for the dermatologist. *Indian Journal of Dermatology*, 61(2), 137-145. doi:10.4103/0019-5154.177775
- Helvacı, M. A. (2015). Schools' readiness towards change. *The Anthropologist*, 19(3), 723-734.
- Hew, T. S., & Kadir, S. L. (2016). Predicting the acceptance of cloud-based virtual learning environment: The roles of self determination and channel expansion theory. *Telematics and Informatics*, 33(4), 990-1013. doi:10.1016/j.tele.2016.01.004
- Hindagolla, M. (2014). Understanding user acceptance of electronic information resources: Effects of content relevance and perceived abilities. *The Journal of the Study of Modern Society and Culture*, (59), 239-255. Retrieved February 21, 2016, from [http://dSPACE.lib.niigata-u.ac.jp/dSPACE/bitstream/10191/31257/1/59\\_239-255.pdf](http://dSPACE.lib.niigata-u.ac.jp/dSPACE/bitstream/10191/31257/1/59_239-255.pdf)
- Hong, W. Y., 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 Information System*, 18(3), 97-124. Retrieved February 11, 2016, from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.473.1489&rep=rep1&type=pdf>
- Huang, C. Y., & Kao, Y. S. (2015). UTAUT2 based predictions of factors influencing the technology acceptance of phablets by DNP. *Mathematical Problems in Engineering*, 1-23. doi:10.1155/2015/603747
- Huang, Y. M., Pu, Y. H., Chen, T. S., & Chiu, P. S. (2015). Development and evaluation of the mobile library service system success model: A case study of Taiwan. *The Electronic Library*, 33(6), 1174-1192. doi:10.1108/el-06-2014-0094
- Hughes, J. (2012). Power issues in internet research. In *Sage internet research methods* (p. 53).
- Intiaz, M. A., & Maarop, N. (2014). Feasibility study of lecturer's acceptance of e-assessment. *Proceedings of the 25th Australasian Conference on Information Systems*.



- Indrawati, & Haryoto, K. S. (2015, August). *The use of modified theory of acceptance and use of technology 2 to predict prospective users' intention in adopting TV streaming*. Paper presented at Proceedings of the 5th International Conference on Computing and Informatics, Istanbul, Turkey.
- Iqbal, S., & Qureshi, I. A. (2012). M-learning adoption: A perspective from a developing country. *International Review of Research in Open & Distance Learning*, 13(3), 147-164. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/viewFile/1152/2246>
- Jackson, S. L. (2016). Correlational procedures. In *Statistics: Plain and simple* (4th ed., p. 329). Cengage Learning.
- Jambulingam, M. (2013). Behavioural intention to adopt mobile technology among tertiary students. *World Applied Sciences Journal*, 22(9), 1262-1271. doi:10.5829/idosi.wasj.2013.22.09.2748
- Janssen, M. (2014). *Electronic government: 13th IFIP WG 8.5 International Conference, EGOV 2014, Dublin, Ireland, September 1-3, 2014. Proceedings*. Dublin: Springer.
- Jawad, H. H. M., & Hassan, Z. B. (2015). Applying Utaut to evaluate the acceptance of mobile learning in higher education in Iraq. *International Journal of Science and Research*, 4(5). Retrieved from <http://www.ijsr.net/archive/v4i5/SUB154307.pdf>
- Joo, Y. J., Joung, S., Shin, E. K., Lim, E., & Choi, M. (2014). Factors influencing actual use of mobile learning connected with e-learning. *Computer Science & Information Technology (CS & IT)*, 169-176. doi:10.5121/csit.2014.41116
- Ju, B., & Albertson, D. (2015). Examining user-driven factors for intentions to use video digital libraries. *Proceedings of the Association for Information Science and Technology*, 52(1), 1-4. doi:10.1002/pr2.2015.145052010087
- Kadir, R. A., Rahman, S. A., Mustaffar, M. Y., Rahman, F., & Amin, Z. M. (2014). Demographic factors and awareness of academic digital libraries at higher learning institutions. *GlobalIlluminators*, 1, 513-528. Retrieved from <http://globalilluminators.org/wp-content/uploads/2014/12/ITMAR-14-444.pdf>

- Kamen, F. L., Ejim, I. F., Nwakaudu, M. S., & Onyelucheya, O. E. (2015). Statistical modeling and optimization of algae oil extraction using response surface methodology. *American International Journal of Contemporary Scientific Research*, 2(3), 20-25.
- Kang, M., Liew, B. Y., Lim, H., Jang, J., & Lee, S. (2014). Investigating the determinants of mobile learning acceptance in Korea using UTAUT2. *Emerging Issues in Smart Learning*, 209-216. doi:10.1007/978-3-662-44188-6\_29
- Karimi, S. (2016). Do learners' characteristics matter? An exploration of mobile-learning adoption in self-directed learning. *Computers in Human Behavior*, 63, 769-776. doi:10.1016/j.chb.2016.06.014
- Kavulya, J. M. (2004). Challenges in the provision of library services for distance education: A case study of selected universities in Kenya. *African Journal of Library, Archives, and Information Science*, 14(1), 15-28.
- Keong, Y. C., Albadry, O., & Raad, W. (2014). Behavioral intention of EFL teachers to apply e-learning. *Journal of Applied Sciences*, 14(20), 2561-2569. doi:10.3923/jas.2014.2561.2569
- Khechine, H., Lakhal, S., Pascot, D., & Bytha, A. (2014). UTAUT model for blended learning: The role of gender and age in the intention to use Webinars. *Interdisciplinary Journal of E-Learning and Learning Objects*, 10, 33-52.
- Kimball, J. (2015). *Motivations of students in the open-ended use of mobile computing in lecture-based classrooms* (Doctoral dissertation). Retrieved from [http://nsuworks.nova.edu/cgi/viewcontent.cgi?article=1367&context=gscis\\_etd](http://nsuworks.nova.edu/cgi/viewcontent.cgi?article=1367&context=gscis_etd)
- Kocaleva, M., Stojanovic, I., & Zdravev, Z. (2015). Model of e-learning acceptance and use for teaching staff in higher education institutions. *IJMECS*, 7(4), 23-31. doi:10.5815/ijmeecs.2015.04.03
- Kothari, C. R. (2004). *Research methodology: Methods & techniques* (2nd ed.). Retrieved from <http://www2.hcmuaf.edu.vn/data/quoctuan/Research%20Methodology%20-%20Methods%20and%20Techniques%202004.pdf>

- Kumar, S. (2011). Effect of web searching on the OPAC: a comparison of selected university libraries. *Library Hi Tech News*, 28(6), 14-21. doi:10.1108/07419051111173883
- Kumar, S. (2012). Impact of internet search engines on OPAC users: A study of Punjabi University, Patiala (India). *Program: Electronic Library and Information Systems*, 46(1), 56-70. doi:10.1108/00330331211204566
- Kumar, V. V., & Rao, P. R. M. (2014). Digitization of Library Resources and the Formation of Digital Libraries: A Practical Approach. *International Journal & Magazine of Engineering, Technology, Management and Research*, 1(12), 69-71. Retrieved from <http://www.ijmetmr.com/oldecember2014/VVijayKumar-DrPRamaMohanRao-14.pdf>
- Lakhal, S., & Khechine, H. (2016). Student intention to use desktop web-conferencing according to course delivery modes in higher education. *The International Journal of Management Education*, 14, 146-160. doi:10.1016/j.ijme.2016.04.001
- Lee, J. Y., Paik, W., & Joo, S. (2012). Information resource selection of undergraduate students in academic search tasks. *Information Research*, 17(1). Retrieved from <http://www.informationr.net/ir/17-1/paper511.html>
- Lee, K. I. (2016). Understanding Taiwan seniors' motivation to consume food-away-from-home. *Journal of Tourism and Hospitality Management*, 4(1), 22-36. doi:10.17265/2328-2169/2016.02.003
- Lee, S. (2008). *Influence of moral view and other variables on purchase intentions concerning counterfeits*. Unpublished degree dissertation, University of Minnesota. Retrieved February 27, 2016, from <http://faculty.mu.edu.sa/public/uploads/1357319510.6006out11.pdf>
- Leng, P. (2010). *Students' perceptions toward private sector higher education in Cambodia* (Master's thesis). Retrieved from [https://etd.ohiolink.edu/rws\\_etd/document/get/ohiou1275029368/inline](https://etd.ohiolink.edu/rws_etd/document/get/ohiou1275029368/inline)
- Letchumanan, M., & Tarmizi, R. (2011). Assessing the intention to use e-book among engineering undergraduates in Universiti Putra Malaysia, Malaysia. *Library Hi Tech*, 29(3), 512-528. doi:10.1108/07378831111174459

- Lewis, C. C., Fretwell, C. E., Jim, R., & Parham, J. B. (2013). Faculty use of established and emerging technologies in higher education: A unified theory of acceptance and use of technology perspective. *International Journal of Higher Education*, 2(2), 22-34. Retrieved from <http://dx.doi.org/10.5430/ijhe.v2n2p22>
- Liao, C., To, P., Liu, C., Kuo, P., & Chuang, S. (2011). Factors influencing the intended use of web portals. *Online Information Review*, 35(2), 237-254. doi:10.1108/14684521111128023
- Li, H., & Lai, V. S. (2008). Antecedents of behavioural intention of virtual community participation: An empirical study. *Americas Conference on Information Systems (AMCIS)*, 369-371.
- Lin, S., Zimmer, J. C., & Lee, V. (2013). Podcasting acceptance on campus: The differing perspectives of teachers and students. *Computers & Education*, 68, 416-428. doi:10.1016/j.compedu.2013.06.003
- Liu, G., Huang, S. P., & Zhu, X. K. (2008). User acceptance of Internet banking in an uncertain and risky environment. *International Conference on Risk Management & Engineering Management*, 381-386. doi:10.1109/icrmem.2008.82
- Lwoga, E. T., & Komba, M. (2014). Understanding university students' behavioural continued intentions to use elearning in Tanzania. *Proceedings and Report of the 7th UbuntuNet Alliance Annual Conference*, 167-188.
- Lwoga, E. T., & Komba, M. (2015). Antecedents of continued usage intentions of web-based learning management system in Tanzania. *Education + Training*, 57 (7), 738-756. doi:10.1108/et-02-2014-0014
- MacDonald, P. D. (2012). Hypothesis-testing interviews. In *Methods in field epidemiology* (p. 175). Burlington, MA: Jones & Bartlett Learning.
- Machado-Da-Silva, F. N., Meirelles, F. D., Filenga, D., & Filho, M. B. (2014). Student satisfaction process in virtual learning system: Considerations based in information and service quality from Brazil's experience. *Turkish Online Journal of Distance Education*, 15(3), 122-142. doi:10.17718/tojde.52605

- Maduku, D.K. (2015). Understanding behavioural intention towards e-books use: Does gender really matter? *Proceedings of 31<sup>st</sup> International Business Research Conference*, 1-15.
- Maiyaki, A. A., & Mokhtar, S. S. M. (2011). Determinants of customer behavioural responses: A pilot study. *International Business Research*, 4(1), 193-197. doi:10.5539/ibr.v4n1p193
- Malaysian Communications and Multimedia Commission. (2015). *Internet users survey 2014*. Retrieved February 5, 2016, from <http://www.skmm.gov.my/skmmgovmy/media/General/pdf/Internet-Users-Survey-2014.pdf>
- Malaysian Qualifications Agency. (2016). *List of private higher education qualifications*. Retrieved April 18, 2016, from <http://www.mqa.gov.my/mqr/english/eakrbyipts.cfm>
- Masa'deh, R., Tarhini, A., Mohammed, A. B., & Maqableh, M. (2016). Modeling factors affecting student's usage behaviour of e-learning systems in Lebanon. *International Journal of Business and Management*, 11(2), 299-312. doi:10.5539/ijbm.v11n2p299
- Merrill, R. M. (2012). *Introduction to epidemiology* (6th ed.). Jones & Bartlett Learning.
- Miller, J., & Khera, O. (2010). Digital Library Adoption and the Technology Acceptance Model: A Cross-Country Analysis. *Electronic Journal on Information Systems in Developing Countries*, 40(6). Retrieved from [https://www.researchgate.net/publication/228631114\\_Digital\\_Library\\_Adoption\\_and\\_the\\_Technology\\_Acceptance\\_Model\\_A\\_Cross-Country\\_Analysis](https://www.researchgate.net/publication/228631114_Digital_Library_Adoption_and_the_Technology_Acceptance_Model_A_Cross-Country_Analysis)
- Ministry of Education Malaysia. (2015). *Malaysia Education Blueprint 2015-2025*. Retrieved from [http://www.moe.gov.my/cms/upload\\_files/files/3\\_%20Malaysia%20Education%20Blueprint%202015-2025%20\(Higher%20Education\).pdf](http://www.moe.gov.my/cms/upload_files/files/3_%20Malaysia%20Education%20Blueprint%202015-2025%20(Higher%20Education).pdf)
- Mohammadi, H. (2015). Investigating users' perspectives on E-learning: An integration of TAM and IS success model. *Computers in Human Behavior*, 45, 359-374. doi:10.1016/j.chb.2014.07.044

- Morar, A., Venter, M., & Chuchu, T. (2015). To vote or not to vote: Marketing factors influencing the voting intention of university students in Johannesburg. *Journal of Economics and Behavioral Studies*, 7(6), 81-93.
- Morosan, C., & DeFranco, A. (2016). It's about time: Revisiting UTAUT2 to examine consumers' intentions to use NFC mobile payments in hotels. *International Journal of Hospitality Management*, 53, 17-29. doi:10.1016/j.ijhm.2015.11.003
- Mtebe, J. S., Mbwilo, B., & Kissaka, M. M. (2016). Factors influencing teachers' use of multimedia enhanced content in secondary schools in Tanzania. *International Review of Research in Open and Distributed Learning*, 17(2). doi:10.19173/irrodl.v17i2.2280
- Mtebe, J. S., & Raisamo, R. (2014). Investigating students' behavioural intention to adopt and use mobile learning in higher education in East Africa. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 10(3), 4-20. Retrieved from <http://ijedict.dec.uwi.edu/viewarticle.php?id=1807>
- Mukisa, M. T., & Ochieng, D. O. (2013). Post adoption evaluation model for cloud computing services utilization in universities in Kenya. *International Journal of Management & Information Technology*, 5(3), 613-628.
- Naing, C., Yeoh, P. N., Wai, V. N., Win, N. N., Kuan, L. P., & Aung, K. (2016). Hypertension in Malaysia: An analysis of trends from the national surveys 1996 to 2011. *Medicine*, 95(2), 1-7. doi:10.1097/md.00000000000002417
- Nair, P. K., Ali, F., & Leong, L. C. (2015). Factors affecting acceptance & use of ReWIND: Validating the extended unified theory of acceptance and use of technology. *Interactive Technology and Smart Education*, 12(3), 183-201. doi:10.1108/itse-02-2015-0001
- Nawaz, S., Ali, R., Batool, S., & Alaudeen, Z. (2015). Use of internet among youth and its effect on library attendance. *Pakistan Journal of Information Management & Libraries (PJIM&L)*, 16, 29-37. Retrieved from <http://journals.pu.edu.pk/journals/index.php/pjiml/article/viewFile/748/385>

- Nguyen, T. D., Nguyen, D. T., & Cao, T. H. (2014). Acceptance and use of information system: E-learning based on cloud computing in Vietnam. *Information and Communication Technology*, 139-149. doi:10.1007/978-3-642-55032-4\_14
- Nguyen, T. D., Nguyen, T. M., Pham, Q., & Misra, S. (2014). Acceptance and use of e-learning based on cloud computing: The role of consumer innovativeness. *Computational Science and Its Applications – ICCSA 2014*, 159-174. doi:10.1007/978-3-319-09156-3\_12
- Oh, J., & Yoon, S. (2014). Predicting the use of online information services based on a modified UTAUT model. *Behaviour & Information Technology*, 33(7), 716-729. doi:10.1080/0144929x.2013.872187
- Pardamean, B., & Susanto, M. (2012). Assessing user acceptance toward blog technology using the UTAUT model. *International Journal of Mathematics and Computers in Simulation*, 6(1), 203-212.
- 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 Information Management*, 29, 196-209. doi:10.1016/j.ijinfomgt.2008.07.001
- QS University Rankings: Asia. (2015). Retrieved from [http://www.topuniversities.com/university-rankings/world-university-rankings/2015#sorting=rank+region="+country="+faculty="+stars=false+search=](http://www.topuniversities.com/university-rankings/world-university-rankings/2015#sorting=rank+region=)
- Radzi, S. M., Bakhtiar, M. F. S., Mohi, Z., Zahari, M. S. M., Sumarian, N., Chik, C. T., & Anuar, F. I. (2014). *Theory and Practice in Hospitality and Tourism Research*. Retrieved from [https://books.google.com.my/books?id=R-isBAAAQBAJ&pg=PA453&lpg=PA453&dq=Salleh+Mohd+Radzi+et+al+.,+2014&source=bl&ots=a1IxvRMMC\\_&sig=de25L8GIIz1ASWSpSV7FfF02erI&hl=en&sa=X&redir\\_esc=y#v=onepage&q=384&f=false](https://books.google.com.my/books?id=R-isBAAAQBAJ&pg=PA453&lpg=PA453&dq=Salleh+Mohd+Radzi+et+al+.,+2014&source=bl&ots=a1IxvRMMC_&sig=de25L8GIIz1ASWSpSV7FfF02erI&hl=en&sa=X&redir_esc=y#v=onepage&q=384&f=false)
- Rahman, A. L., Jamaludin, A., & Mahmud, Z. (2011a). Considering race, mode of study, university and academic structure differences on behavioural intention to use information systems. *2011 IEEE Colloquium on Humanities, Science and Engineering*, 117-120. doi:10.1109/chuser.2011.6163698

- Rahman, A. L. A., Jamaluddin, A., & Mahmud, Z. (2011b). Intention to use digital library based on modified UTAUT model: Perspectives of Malaysian postgraduate students. *International Journal of Social, Behavioral, Educational, Business and Industrial Engineering*, 5(3), 270-276. Retrieved February 15, 2016, from <http://waset.org/Publication/intention-to-use-digital-library-based-on-modified-utaut-model-perspectives-of-malaysian-postgraduate-students/2983>
- Raman, A., & Don, Y. (2013). Preservice teachers' acceptance of learning management software: An application of the UTAUT2 model. *International Education Studies*, 6(7), 157-164. doi:10.5539/ies.v6n7p157
- Raman, A., Don, Y., Khalid, R., & Rizuan, M. (2014). Usage of learning management system (Moodle) among postgraduate students: UTAUT Model. *Asian Social Science*, 10(14), 186-192. doi:10.5539/ass.v10n14p186
- Raman, S. R., & Sua, T. Y. (2010). Ethnic segregation in Malaysia's education system: enrolment choices, preferential policies and desegregation. *Paedagogica Historica*, 46(1-2), 117-131. doi:10.1080/00309230903528496
- Ramayah, T., Ahmad, N. H., & Lo, M. (2010). The role of quality factors in intention to continue using an e-learning system in Malaysia. *Procedia Social and Behavioral Sciences*, 2(2), 5422-5426. doi:10.1016/j.sbspro.2010.03.885
- Ramli, S. S. M., Nathan, R. J., & Liew, T. W. (2015). Adaptation of UTAUT2 model in understanding student's acceptance of virtual learning agent. *Australian Journal of Basic and Applied Sciences*, 9(25), 66-71. Retrieved from [http://ajbasweb.com/old/ajbas/2015/Special%20IPN%20Langkawi%20\(Aug\)/66-71.pdf](http://ajbasweb.com/old/ajbas/2015/Special%20IPN%20Langkawi%20(Aug)/66-71.pdf)
- Richter, T. (2012). *International marketing mix management: Theoretical framework, contingency factors and empirical findings from world-markets* (p. 133). Berlin: Logos-Verl.
- Rondan-Cataluña, F. J., Arenas-Gaitán, J., & Ramírez-Correa, P. E. (2015). A comparison of the different versions of popular technology acceptance models. *Kybernetes*, 44(5), 788-805. doi:10.1108/k-09-2014-0184



- Rull, E., Wagner, W. E., & Gillespie, B. J. (2015). *The practice of survey research: Theory and applications*. SAGE Publications.
- Ryan, T. P. (2013). Methods of determining sample sizes. In *Sample size determination and power*. Hoboken, NJ: John Wiley & Sons.
- Sahak, M. D., & Masrek, M. N. (2014). Library usage of medical students: A comparative analysis of first year and third year students in Universiti Putra Malaysia. *Procedia- Social and Behavioral Sciences*, 129, 127-132. doi:10.1016/j.sbspro.2014.03.657
- Salmi, M. A., & Hasnan, N. (2016). E-government analysis: Sultanate of Oman case. *Open Journal of Social Sciences*, 4, 35-40. doi:10.4236/jss.2016.43006
- Samadi, I., & Masrek, M. N. (2013). Evaluating digital library effectiveness: A survey at University of Tehran. *2013 International Conference on Advanced Computer Science Applications and Technologies*, 80-84. doi:10.1109/acsat.2013.23
- Samuel, M., & Okey, L. E. (2015). The relevance and significance of correlation in social science research. *International Journal of Sociology and Anthropology Research*, 1(3), 22-28.
- Saunders, M., Lewis, P., & Thornhill, A. (2012). Selecting samples. In *Research Methods for Business Students* (6th ed., pp. 258-303). Harlow Essex CM20 2JE, England: Pearson Education Limited.
- Sharma, S. K., Joshi, A., & Sharma, H. (2016). A multi-analytical approach to predict the Facebook usage in higher education. *Computers in Human Behavior*, 55, 340-353. doi:10.1016/j.chb.2015.09.020
- Siegel, A. F. (2011). Data structures. In *Practical business statistics* (6th ed., p. 23). Burlington, MA: Academic Press.
- Sim, J., Tan, G. W., Wong, J. C., Ooi, K., & Hew, T. (2014). Understanding and predicting the motivators of mobile music acceptance – A multi-stage MRA-artificial neural network approach. *Telematics and Informatics*, 31(4), 569-584. doi:10.1016/j.tele.2013.11.005

- Singeh, F. W., Abrizah, A., & Abdul Karim, N. H. (2013). Malaysian authors' acceptance to self-archive in institutional repositories: Towards a unified view. *The Electronic Library*, 31(2), 188-207. doi:10.1108/02640471311312375
- Tabassum, M., Roknuzzaman, M., & Islam, M. M. (2015). Usage of a digital library system at a private university library in Bangladesh. *Annals of Library and Information Studies*, 62, 94-103. Retrieved from [http://nopr.niscair.res.in/bitstream/123456789/31963/1/ALIS%2062\(2\)%2094-103.pdf](http://nopr.niscair.res.in/bitstream/123456789/31963/1/ALIS%2062(2)%2094-103.pdf)
- Tam, C., & Oliveira, T. (2016). Understanding the impact of m-banking on individual performance: DeLone & McLean and TTF perspective. *Computers in Human Behavior*, 61, 233-244. doi:10.1016/j.chb.2016.03.016
- Tavares, J., & Oliveira, T. (2014). Electronic health record portal adoption by health care consumers - Proposal of a new adoption model. *Proceedings of the 10th International Conference on Web Information Systems and Technologies*, 387-393. doi:10.5220/0004947003870393
- Tella, A. (2011). Predicting users' acceptance of e-library from the perspective of technology acceptance model. *International Journal of Digital Library Systems*, 2(4), 34-44. doi:10.4018/jdls.2011100104
- Thomas, T. D., Singh, L., & Gaffar, K. (2013). The utility of the UTAUT model in explaining mobile learning adoption in higher education in Guyana. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 9(3), 71-85. Retrieved from <http://ijedict.dec.uwi.edu/viewarticle.php?id=1687>
- Thompson, C. (2015, October 4). *The Top eLearning Statistics and Facts for 2015 You Need To Know*. Retrieved February 5, 2016, from <https://www.linkedin.com/pulse/top-elearning-statistics-facts-2015-you-need-know-colin-thompson>
- Trivedi, M. (2010). Digital libraries: Functionality, usability, and accessibility. *Library Philosophy and Practice 2010*, 1-6. Retrieved from <http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1395&context=libphilprac>

- Uğur, N. G., Koç, T., & Koç, M. (2016). An analysis of mobile learning acceptance by college students. *Journal of Educational and Instructional Studies*, 6(2), 39-49. Retrieved from [http://www.wjeis.org/FileUpload/ds217232/File/05.naciye\\_guliz\\_ugur.pdf](http://www.wjeis.org/FileUpload/ds217232/File/05.naciye_guliz_ugur.pdf)
- Usoro, A., Echeng, R., & Majewski, G. (2013). A model of acceptance of web 2.0 in learning in higher education: A case study of two cultures. *Journal on Computing*, 3(3). doi:10.7603/s40601-013-0024-y
- U.S. Department of State. (2016). *Independent states in the world*. Retrieved from <http://www.state.gov/s/inr/rls/4250.htm>
- 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. Retrieved from March 2, 2016 <http://www.cob.calpoly.edu/~eli/Class/p25.pdf>
- Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the Unified Theory of Acceptance and Use of Technology. *Forthcoming in MIS Quarterly*, 36(1), 157-178. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2002388](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2002388)
- Wang, H. (2008a). *Safety factors and leading in shipping organizations: Tanker and container operations*. Unpublished degree dissertation, Rensselaer Polytechnic Institute, New York, United States. Retrieved March 2, 2016, from [http://digitool.rpi.edu:8881/R/CRI2JVQE153PTQRA39D97453ERGBDH2PSYYDNT97HYK6YTCH2-04006?func=dbin-jump-full&object\\_id=11070&local\\_base=GEN01&pds\\_handle=GUEST](http://digitool.rpi.edu:8881/R/CRI2JVQE153PTQRA39D97453ERGBDH2PSYYDNT97HYK6YTCH2-04006?func=dbin-jump-full&object_id=11070&local_base=GEN01&pds_handle=GUEST)
- Wang, H. C., & Chiu, Y. F. (2011). Assessing e-learning 2.0 system success. *Computers & Education*, 57(2), 1790-1800. doi:10.1016/j.compedu.2011.03.009
- Wang, S. M., & Lin, J. C. C. (2011). The effect of social influence on bloggers' usage intention. *Online Information Review*, 35(1), 50-65. doi:10.1108/14684521111113588

- Wang, Y. (2008b). Assessing e-commerce systems success: a respecification and validation of the DeLone and McLean model of IS success. *Information Systems Journal*, 18(5), 529-557. doi:10.1111/j.1365-2575.2007.00268.x
- Wheelan, C. J. (2013). *Naked statistics: Stripping the dread from the data*. Retrieved from <http://www.samaras-assoc.com/PublicDocs/QuickStatGuide.pdf>
- Wohn, D. Y. (2015). The effects of feedback and habit on content posting in an online community. In *Proceedings of iConference 2015*, Washington, D.C.: iSchools.1-8.
- Wong, C. H., Tan, G. W., Loke, S. P., & Ooi, K. B. (2014). Mobile TV: A new form of entertainment? *Industrial Management & Data Systems*, 114(7), 1050-1067. doi:10.1108/imds-05-2014-0146
- Xu, X. (2014). Understanding users' continued use of online games: An application of UTAUT2 in social network games. *The Sixth International Conferences on Advances in Multimedia*. Retrieved from [https://www.thinkmind.org/download.php?articleid=mmedia\\_2014\\_4\\_10\\_50036](https://www.thinkmind.org/download.php?articleid=mmedia_2014_4_10_50036)
- Yang, S. (2013). Understanding undergraduate students' adoption of mobile learning model: A perspective of the extended UTAUT2. *Journal of Convergence Information Technology*, 8(10), 969-979. doi:10.4156/jcit.vol8.issue10.118
- Yun, H., Han, D., & Lee, C. C. (2013). Understanding the use of location-based service applications: Do privacy concerns matter?. *Journal of Electronic Commerce Research*, 14(3), 215-230.
- Zaied, A. N. H. (2012). An integrated success model for evaluating information system in public sectors. *Journal of Emerging Trends in Computing and Information Sciences*, 3(6), 814-825. Retrieved from [http://www.cisjournal.org/journalofcomputing/archive/vol3no6/vol3no6\\_1.pdf](http://www.cisjournal.org/journalofcomputing/archive/vol3no6/vol3no6_1.pdf)
- Zhu, W. W., Wei, J. C., & Zhao, D. T. (2016). Anti-nuclear behavioral intentions: The role of perceived knowledge, information processing, and risk perception. *Energy Policy*, 88, 168-177. doi:10.1016/j.enpol.2015.10.009

## APPENDICES

Appendix 1.1: List of Private Universities in Malaysia and Their Library Websites

No.	Name of University	State	Library Website
1	AIMST University	Kedah	<a href="http://portallibrary.aimst.edu.my/equip-aimst/">http://portallibrary.aimst.edu.my/equip-aimst/</a>
2	Albukhary International University	Kedah	Not found
3	Al-Madinah International University (MEDIU)	Selangor	<a href="http://www.mediu.edu.my/blog/2015/12/03/mediu-libraries/">http://www.mediu.edu.my/blog/2015/12/03/mediu-libraries/</a>
4	Asia e University	Wilayah Persekutuan Kuala Lumpur	<a href="http://library.aeu.edu.my/">http://library.aeu.edu.my/</a>
5	Asia Metropolitan University	Selangor	Not found
6	Asia Pacific University of Technology and Innovation (Asia Pacific UTI)	Wilayah Persekutuan Kuala Lumpur	<a href="https://library.apiit.edu.my/">https://library.apiit.edu.my/</a>
7	Binary University of Management and Entrepreneurship	Selangor	Not found but the university has provided digital library as specified on its website: <a href="http://www.binary.edu.my/about-us/facilities/campus-facilities.html">http://www.binary.edu.my/about-us/facilities/campus-facilities.html</a>
8	Curtin University, Sarawak Malaysia	Sarawak	<a href="http://library.curtin.edu.my/">http://library.curtin.edu.my/</a>
9	DRB-HICOM University of Automotive Malaysia	Pahang	Not found
10	HELP University	Wilayah Persekutuan Kuala Lumpur	<a href="http://library.help.edu.my/">http://library.help.edu.my/</a>
11	Heriot-Watt University Malaysia	Wilayah Persekutuan Putrajaya	<a href="http://www.hw.ac.uk/is/library-essentials/onoff-campus-access.htm">http://www.hw.ac.uk/is/library-essentials/onoff-campus-access.htm</a>
12	Infrastructure University Kuala Lumpur	Selangor	<a href="http://iukl.edu.my/campus-life/library/">http://iukl.edu.my/campus-life/library/</a>
13	International Centre for Education in Islamic Finance (INCEIF)	Wilayah Persekutuan Kuala Lumpur	<a href="http://www.inceif.org/knowledge-management-centre/">http://www.inceif.org/knowledge-management-centre/</a>

14	International Medical University (IMU)	Wilayah Persekutuan Kuala Lumpur	<a href="http://i-lib.imu.edu.my/NewPortal/">http://i-lib.imu.edu.my/NewPortal/</a>
15	International University of Malaya-Wales (IUMW)	Wilayah Persekutuan Kuala Lumpur	<a href="http://www.iumw.edu.my/student/library/">http://www.iumw.edu.my/student/library/</a>
16	INTI International University	Negeri Sembilan	<a href="http://intilib.intimal.edu.my/equipmentin/custom/home.jsp">http://intilib.intimal.edu.my/equipmentin/custom/home.jsp</a>
17	Limkokwing University of Creative Technology	Selangor	Not found but the university has provided digital library as specified on its website: <a href="http://www.limkokwing.net/malaysia/life/facilities/library">http://www.limkokwing.net/malaysia/life/facilities/library</a>
18	MAHSA University	Wilayah Persekutuan Kuala Lumpur	Not found
19	Malaysia University of Science and Technology	Selangor	Not found
20	Malaysian Institute for Supply Chain Innovation (MISI)	Selangor	Not found but the university has provided digital library as specified on its website: <a href="http://www.misi.edu.my/future-students/misi-experience/">http://www.misi.edu.my/future-students/misi-experience/</a>
21	Management and Science University	Selangor	<a href="http://www.msu.edu.my/v10/library-resource-centre/library-online-resources.php">http://www.msu.edu.my/v10/library-resource-centre/library-online-resources.php</a>
22	Manipal International University	Negeri Sembilan	Not found
23	Monash University Malaysia	Selangor	<a href="http://www.lib.monash.edu.my/">http://www.lib.monash.edu.my/</a>
24	Multimedia University	Selangor Malacca	<a href="http://vlib.mmu.edu.my/library/">http://vlib.mmu.edu.my/library/</a>
25	Newcastle University Medicine Malaysia	Johor	<a href="http://libguides.ncl.ac.uk/c.php?g=130175">http://libguides.ncl.ac.uk/c.php?g=130175</a>
26	Nilai University	Negeri Sembilan	<a href="http://www.nilai.edu.my/library/e-resources">http://www.nilai.edu.my/library/e-resources</a>
27	Open University Malaysia - OUM	Wilayah Persekutuan Kuala Lumpur	<a href="http://library.oum.edu.my/oumlib/">http://library.oum.edu.my/oumlib/</a>

28	Putra Business School (PBS)	Selangor	<a href="http://putrabusinessschool.edu.my/student-campus/resource-centre-library/">http://putrabusinessschool.edu.my/student-campus/resource-centre-library/</a>
29	Quest International University Perak (QIUP)	Perak	<a href="http://sites.qiup.edu.my/library-division/">http://sites.qiup.edu.my/library-division/</a>
30	Raffles University Iskandar (RUI)	Johor	<a href="http://infotrac.galegroup.com/default/myrui">http://infotrac.galegroup.com/default/myrui</a>
31	SEGi University	Selangor	<a href="http://www.segi.edu.my/apps/sckd_library/">http://www.segi.edu.my/apps/sckd_library/</a>
32	Sunway University	Selangor	<a href="http://library.sunway.edu.my/">http://library.sunway.edu.my/</a>
33	Swinburne University of Technology Sarawak Campus	Sarawak	<a href="http://www.swinburne.edu.my/library/">http://www.swinburne.edu.my/library/</a>
34	Taylor's University	Selangor	<a href="https://taylorslibrary.taylors.edu.my/">https://taylorslibrary.taylors.edu.my/</a>
35	The University of Nottingham Malaysia Campus	Selangor	<a href="http://www.nottingham.edu.my/IS/LibraryServices/index.aspx">http://www.nottingham.edu.my/IS/LibraryServices/index.aspx</a>
36	UCSI University	Wilayah Persekutuan Kuala Lumpur	<a href="http://www.ucsiuniversity.edu.my/library/">http://www.ucsiuniversity.edu.my/library/</a>
		Sarawak	
		Terengganu	
37	UNITAR International University	Selangor	<a href="http://kmc.unitar.my/">http://kmc.unitar.my/</a>
38	Universiti Kuala Lumpur (UniKL)	Selangor	<a href="http://library.unikl.edu.my/">http://library.unikl.edu.my/</a>
		Wilayah Persekutuan Kuala Lumpur	
		Johor	
		Kedah	
		Perak	
39	Universiti Selangor (UNISEL)	Selangor	<a href="http://library.unisel.edu.my/">http://library.unisel.edu.my/</a>
40	Universiti Teknologi PETRONAS (UTP)	Perak	<a href="http://ulibrary.utp.edu.my/">http://ulibrary.utp.edu.my/</a>
41	Universiti Tenaga Nasional (UNITEN)	Selangor	<a href="http://lib.uniten.edu.my/vlib/">http://lib.uniten.edu.my/vlib/</a>
		Pahang	
42	Universiti Tun Abdul Razak (UNIRAZAK)	Wilayah Persekutuan Kuala Lumpur	<a href="http://library.unirazak.edu.my/">http://library.unirazak.edu.my/</a>

		Selangor	
43	Universiti Tunku Abdul Rahman (UTAR)	Selangor Perak	<a href="http://library.utar.edu.my/">http://library.utar.edu.my/</a>
44	University Malaysia of Computer Science and Engineering	Wilayah Persekutuan Putrajaya	<a href="http://www.unimy.edu.my/library/index.cfm">http://www.unimy.edu.my/library/index.cfm</a>
45	University of Reading Malaysia Campus (UoRM)	Johor	<a href="https://www.reading.ac.uk/lrc/lrc-home.aspx">https://www.reading.ac.uk/lrc/lrc-home.aspx</a>
46	University of Southampton Malaysia Campus	Johor	<a href="http://library.soton.ac.uk/malaysia">http://library.soton.ac.uk/malaysia</a>
47	Wawasan Open University	Penang	<a href="http://woulibrary.wou.edu.my/">http://woulibrary.wou.edu.my/</a>

Adapted from: Malaysian Qualifications Agency (2016)



Appendix 2.1: Definition of Variables

Variable	Definition	References
Behavioural Intention (BI)	“The degree to which a person has formulated conscious plans to perform or not perform some specified future behaviours”.	Ajzen & Fishbein (as cited in Lee, 2016)
	“A person’s perceived likelihood or subjective probability that he or she will engage in a given behaviour”.	Nysveen, Pedersen, & Thorbjornsen (as cited in Alawamreh & Elias, 2015)
	“An individual’s planned or anticipated future behaviour”.	Lam & Hsu (as cited in Morar, Venter, & Chuchu, 2015)
Performance Expectancy (PE)	“The degree to which an individual believes that using the system will help him or her to attain gains in job performance”.	Venkatesh, Morris, Davis, & Davis (as cited in Salmi & Hasnan, 2016).
	“The perceived gains a user will achieve from using a system in their job context through direct improvements to work productivity and/or quality”.	Cohen, Bancilhon, & Jones, 2013
	“The degree to which one believes that the use of a certain technology will be useful for enhancing task performance”.	Yun, Han, & Lee, 2013
Effort Expectancy (EE)	“The degree to which users find technology easy to use”.	Venkatesh, Morris, Davis, & Davis (as cited in Chopra & Rajan, 2016)
	“It also means that a learner believes that using a system is free of additional effort”.	Chang, 2013

	“The degree of simplicity to use a particular system which reveals the degree to how much effort the user put to use the system”.	Venkatesh, Morris, Davis, & Davis (as cited in Masa’deh, Tarhini, Mohammed, & Maqableh, 2016)
Social Influence (SI)	“The degree to which a user perceives that important others believe he or she should use the new system”.	Venkatesh, Morris, Davis, & Davis (as cited in Mtebe & Raisamo, 2014)
	“The person’s perception that most people who are important to him think he should or should not perform the behaviour in question”.	Fishbein & Ajzen, 1975 (as cited in Alfaresi & Hone, 2015 )
Facilitating Conditions (FC)	“The availability of facilities that support the respondents’ use of the technology”.	Venkatesh, Morris, Davis, & Davis; Venkatesh, Thong, & Xu; Indrawati, Murugesan, & Raman; Indrawati; Wong, Tan, Loke, & Ooi; You; Foon & Yin-Fah (as cited in Indrawati & Haryoto, 2015)
	“An external factor and affects the general form of personal perception of technology and the form of resource facilitating conditions”.	Taylor & Todd (as cited in Keong, Albadry, & Raad, 2014).
	“The perceived extent to which the organizational and technical infrastructure required for the support of the technologies exists”.	Thomas, Singh, & Gaffar, 2013

Hedonic Motivation (HM)	“The enjoyment a person can experience from using a technology”.	Venkatesh, Thong, & Xu (as cited in Gerhart, Peak, & Prybutok, 2015)
	“An enjoyment or happiness resultant from using a technology”.	Brown & Venkatesh (as cited in Raman & Don, 2013)
	“The associated fun or pleasure experienced by an individual in using a technology”.	Ain, Kaur, & Waheed, 2015
Habit (HB)	“The extent to which people tend to perform behaviours (use information system) automatically because of learning”.	Limayem & Hirt (as cited in Clements, 2015)
	“A perceptual structure which can represent the result of prior experience”.	Venkatesh, Thong, & Xu, 2012
Information Quality (IQ)	“The quality of the output provided by an information system”.	DeLone & McLean (as cited in Chen & Chengalur-Smith, 2015)
	“Measure of information and data for desired characteristics such as accuracy, precision, currency, reliability, completeness, conciseness, relevance, understandability, meaningfulness, timeliness, comparability and format”.	Samadi & Masrek, 2013
	“Evaluation of the quality of the information systems’ output”.	Huang, Pu, Chen, & Chiu, 2015

Source: Developed for the research

Appendix 2.2: Summary of Past Empirical Studies

<b>Study</b>	<b>Country</b>	<b>Data</b>	<b>Major Findings</b>
<b>Performance Expectancy (PE)</b>			
Usoro, Echeng, & Majewski, 2013	Nigeria	600 samples gathered from 317 students and lecturers at five Nigerian universities by the use of face-to-face questionnaires and from 273 students and lecturers at one Scotland's university by the use of e-mail questionnaires.	Performance expectancy would affect intention to use web 2.0 in e-learning positively and highly significantly.
Ayele & Sreenivasarao, 2013	Ethiopia	Data obtained by distributing questionnaires to 276 academic staff and postgraduates from different universities.	Performance expectancy had the strongest positive impact on the intention to use e-library services.
Lwoga & Komba, 2015	Tanzania	231 out of 300 third year undergraduates responded to the questionnaires.	Performance expectancy would explain continued usage intention of web-based learning management systems positively and substantially.
Tabassum, Roknuzzaman, & Islam, 2015	Bangladesh	129 valid responses from 140 questionnaires given to both users and staff of the library.	There was a significant connection between perceived usefulness and intention to use digital library.

Abdullateef & Allumi, 2014	Malaysia	137 valid e-mail questionnaires collected from 221 postgraduates and undergraduates in a northern university.	The relationship between performance expectancy and behavioural intention to adopt online learning zone was positive but weak.
Effort Expectancy (EE)			
Awwad & Al-Majali, 2015	Jordan	575 valid responses from 700 questionnaires sent to students from the 4 largest public universities.	The positive impact of effort expectancy on students' behavioural intention to use e-library services was the strongest.
Mtebe & Raisamo, 2014	East Africa	823 usable samples out of 1518 questionnaires given to students in 5 different higher education institutions, of which 697 were usable hardcopies. and 126 were valid online responses	Students' behavioural intention to adopt mobile learning was positively and significantly driven by effort expectancy.
Ju & Albertson, 2015	United States	202 usable responses out of 229 total responses in the online survey.	The influence of perceived ease of use on intention to use video digital library was positive and strong.
Hindagolla, 2014	Sri Lanka	538 completed questionnaires from 610 final year undergraduates.	Perceived ease of use was found to have a strong positive influence on the intention to use electronic information sources.

Masa'deh, Tarhini, Mohammed, & Maqableh, 2016	Lebanon	359 data from 500 questionnaires distributed to students at two universities.	It is less likely that effort expectancy would have a direct positive effect on students' behavioural intention to use e-learning system.
Social Influence (SI)			
Al-Sultan, 2015	Kuwait	242 questionnaires had been distributed to students at ACK and GUST and only 212 questionnaires had been collected back.	Social influence had a significant effect on behavioural intention to use e-library.
Farahat, 2012	Egypt	20 questionnaires had been excluded from final samples of 141 questionnaires from students as they were incomplete.	Social influence had a positive and significant relationship with students' behavioural intention to use online learning.
Al-Gahtani, 2016	Saudi Arabia	286 out of 600 questionnaires were collected from students of six targeted colleges.	Social influence had significant effect on the behavioural intention in using e-learning.
Chang, Lou, Cheng, & Lin, 2015	China	1089 out of 1206 questionnaires collected from students were valid.	Social influence was positively associated with the behavioural intention.

Evans & Le Roux, 2016	South Africa	Only 405 and 73 questionnaires collected from students and academic staff respectively were valid.	Social influence was found to have the weakest positive relationship with behavioural intention but significantly associated with students' acceptance of using electronic learning. For academic staff, social influence had insignificant effect on behavioural intention.
Facilitating Conditions (FC)			
Chang, 2013	Taiwan	363 surveys were collected from undergraduate and graduate students from schools in Eastern Taiwan.	Facilitating conditions was positively related with the behavioural intention to adopt the library mobile application in university library.
Abdullah, Siraj, & Lim, 2014	Malaysia	220 surveys were collected from the Engineering undergraduate students of a Malaysian private university who were undergoing an English Language Communication course.	There was a positive relationship between facilitating conditions and the use intention.
Iqbal & Qureshi, 2012	Pakistan	300 structured questionnaires were distributed to students from 10 chartered universities operating in the twin city of Rawalpindi and Islamabad in Pakistan with a response rate of 83%.	Facilitating conditions positively influenced the intention to use m-learning.

Thomas, Singh & Gaffar, 2013	Guyana	322 completed surveys were collected from the students of University of Guyana through the web survey.	Facilitating conditions positively influenced the intention to use mobile learning.
Maduku, 2015	South Africa	544 surveys data were obtained from students from two public universities and three private colleges in Gauteng Province in South Africa.	Facilitating conditions positively influenced the intention to use e-books.
Hedonic Motivation (HM)			
Raman & Don, 2013	Malaysia	Google online surveys of 288 undergraduate students from University Utara Malaysia were received out 320 surveys.	Hedonic motivation was positively related to the behavioural intention on the use of Learning Management Software.
Yang, 2013	China	182 web-based questionnaires were collected from undergraduate students of an eastern China university.	Hedonic motivation was significantly and positively influencing the undergraduates' behavioural intention to adopt mobile learning.
Nguyen, Nguyen, & Cao, 2014	Vietnam	282 out of 320 questionnaires received from both the users and potential users were found usable.	Hedonic motivation had a strong positive association with intention to adopt cloud-based e-learning in Vietnam.



Bere , 2014	South Africa	196 valid self-administered surveys were received from the students at University of Technology in South Africa.	Hedonic motivation had moderately positive influence on behavioural intention to adopt m-learning using a mobile instant messaging application.
Ain, Kaur, & Waheed, 2015	Malaysia	349 closed-ended quantitative questionnaires were collected from undergraduate and postgraduate students who were using Learning Management System (LMS).	Hedonic motivation had insignificant relationship with the behavioural intention towards Learning Management Software.
Habit (HB)			
Kang, Liew, Lim, Jang, & Lee, 2014	Korea	305 out of 325 surveys were obtained and analysed for the study.	Habit significantly affected the students' behavioural intention to use mobile learning.
Lewis, Fretwell, Jim, & Parham, 2013	USA	46 online surveys had been collected from business faculty members teaching face-to-face classes at a South Eastern University which represented 51% of the total numbers of surveys distributed to the population of interest.	Habit positively influenced the behavioural intention to use classroom technology.

Nair, Ali, & Leong, 2015	Malaysia	416 questionnaires had been collected from students of Taylor University, Malaysia.	Habit significantly influenced the students' behavioural intention towards ReWIND.
Escobar-Rodríguez, Carvajal-Trujillo, & Monge-Lozano, 2014	Spain	956 out of 1200 usable questionnaires were received from students.	Habit was a strong predictor of students' behavioural intention towards Facebook.
Mtebe, Mbwilo, & Kissaka, 2016	Tanzania	1,137 out of 2,000 self-administered surveys were received from teachers.	Habit was revealed to have significant negative influence on the teachers' acceptance and use of developed multimedia-enhanced content.
Information quality (IQ)			
Rahman, Jamaludin & Mahmud, 2011b	Malaysia	534 questionnaires were distributed to the students at four public intensive research universities in Malaysia.	Information quality was significantly and positively related to intention to use digital library.

Samadi & Masrek, 2013	Iran	425 questionnaires had been received from library users at University of Tehran which included 272 males and 153 females.	Information quality had a positive relationship with digital library use.
Huang, Pu, Chen & Chiu, 2015	Taiwan	300 questionnaires were sent out to students who were users of mobile library service system at National University of Tainan and 254 were returned which included 206 valid and 48 invalid.	Information quality of the mobile library service system had a significant positive influence on system use.
Mohammadi, 2015	Iran	420 students were selected and each 105 questionnaires were distributed to four public universities in three main faculties, out of which 390 were collected.	Information quality was found positively affecting user intention to use e-learning system.
Chiu, Chao, Kao, Pu, & Huang, 2016	Taiwan	123 valid questionnaires were collected from three universities in southern Taiwan and yielding response rate of 41%.	Information quality had positive but insignificant effect on intention to use cloud e-bookcase.

Source: Developed for the research

Appendix 3.1: QS University Rankings: Asia 2015 (Filtered by Private Universities)

<b>Rank</b>	<b>University</b>	<b>State</b>
151-160	Universiti Teknologi PETRONAS (UTP)	Perak
201-250	Multimedia University	Selangor
		Malacca
	Taylor's University	Selangor
251-300	Limkokwing University of Creative Technology	Selangor
	UCSI University	Wilayah Persekutuan Kuala Lumpur
		Sarawak
		Terengganu
	Universiti Tenaga Nasional (UNITEN)	Selangor
	Universiti Tunku Abdul Rahman (UTAR)	Selangor
Perak		

Adapted from: QS University Rankings: Asia (2015)

Appendix 3.2: Number of Subscribed E-Databases (updated as at April 17, 2016)

<b>University</b>	<b>No. of Subscribed E-Databases</b>	<b>Source</b>
Universiti Teknologi PETRONAS (UTP)	28	<a href="http://ulibrary.utp.edu.my/index.php/2013-05-10-07-29-29/subscribed-databases">http://ulibrary.utp.edu.my/index.php/2013-05-10-07-29-29/subscribed-databases</a>
Multimedia University	60	<a href="http://vlib.mmu.edu.my/diglib/login/dlusr/login.php">http://vlib.mmu.edu.my/diglib/login/dlusr/login.php</a>
Taylor's University	52	<a href="https://taylorslibrary.taylors.edu.my/resources/online_database">https://taylorslibrary.taylors.edu.my/resources/online_database</a>
Limkokwing University of Creative Technology	Unknown	-
UCSI University	14	<a href="http://www.ucsiuniversity.edu.my/library/eresources/database.aspx">http://www.ucsiuniversity.edu.my/library/eresources/database.aspx</a>
Universiti Tenaga Nasional (UNITEN)	11	<a href="http://lib.uniten.edu.my/vlib/index.php?option=com_content&amp;view=article&amp;id=26&amp;Itemid=517">http://lib.uniten.edu.my/vlib/index.php?option=com_content&amp;view=article&amp;id=26&amp;Itemid=517</a>
Universiti Tunku Abdul Rahman (UTAR)	46	<a href="http://library.utar.edu.my/gw_2012_2_2/html/default/en/2014/e-Databases.html">http://library.utar.edu.my/gw_2012_2_2/html/default/en/2014/e-Databases.html</a>
Curtin University	Over 600	<a href="http://libguides.library.curtin.edu.au/c.php?g=202408&amp;p=1332746">http://libguides.library.curtin.edu.au/c.php?g=202408&amp;p=1332746</a>

Source: Developed for the research

### Appendix 3.3: Selection of Private Universities in a Nutshell

Top 300 QS Malaysian Private Universities 2015



Subscribed to the largest number of e-databases



East Malaysia

West Malaysia



Curtin University Sarawak

Northern Central Southern



UTAR UTAR MMU

Source: Developed for the research

Note 1: Curtin University was selected to represent East Malaysia because it has the highest QS World Ranking (284th which superseded Swinburne University that ranked only 501-550) and the greatest number of subscribed e-databases (at least 600 databases compared to Swinburne University that subscribed to only around 300 databases) among private universities in East Malaysia.

Note 2: Taylor Malaysia campus was not chosen even if it has subscribed to 52 e-databases because it was just awarded university status in 2010 and could only offer its own bachelor degree starting 2010. As a result, the undergraduates at Taylor may be new to the digital library.

Note 3: MMU Cyberjaya was not selected to represent Central Malaysia due to failure to obtain the permission of conducting survey from MMU Cyberjaya by its semester break (6 June 2016). UTAR Sungai Long was then targeted.

## Appendix 3.4: Ranking of Repositories

<b>Ranking</b>	<b>World Rank</b>	<b>Institution</b>	<b>Status</b>
1	129	Universiti Putra Malaysia Institutional Repository	Public
2	251	Universiti Sains Malaysia Institutional Repository	Public
3	302	International Islamic University Malaysia Repository	Public
4	402	Universiti Malaysia Pahang Institutional Repository	Public
5	451	Universiti Malaysia Perlis Library Digital Repository	Public
6	480	Universiti Kebangsaan Malaysia Journal Article Repository	Public
7	484	University of Malaya Repository	Public
8	515	Universiti Tun Hussein Onn Malaysia Institutional Repository	Public
9	516	University of Malaya Research Repository	Public
10	536	Universiti Utara Malaysia Repository	Public
11	579	Universiti Utara Malaysia E Theses	Public
12	601	Universiti Malaysia Sabah Institutional Repository	Public
13	608	University of Malaya Students' Repository	Public
14	850	Universiti Teknologi MARA Institutional Repository	Public
15	898	Universiti Malaysia Sarawak Institutional Repository	Public
16	913	e-IMtiyaz Islamic Science University of Malaysia Repository	Public
17	1057	Universiti Malaysia Kelantan Institutional Repository	Public

18	1065	<b>Universiti Tunku Abdul Rahman (UTAR) Institutional Repository</b>	Private
19	1156	National Library of Malaysia Digital Repository	National
20	1183	Universiti Teknologi Malaysia Institutional Repository	Public
21	1415	Universiti Teknikal Malaysia Melaka Repository	Public
22	1420	<b>Multimedia University Digital Repository</b>	Private
23	1492	Sunway Institutional Repository	Private
24	1515	Universiti Tenaga Nasional Library Digital Repository	Private
25	1591	Universiti Kuala Lumpur Institutional Repository	Private
26	1658	Repository Universiti Sultan Zainal Abidin	Public
27	1935	Universiti Kebangsaan Malaysia Repository	Public
28	2029	Open University Malaysia (OUM) Knowledge Repository	Private
29	2092	Wawasan Open University (WOU) OER Repository	Private
30	2143	International Medical University (IMU) Central Digital Repository	Private

Adapted from: Consejo Superior de Investigaciones Científicas (2016)

According to the table above, UTAR and Multimedia University are the top two private universities in the Ranking of Repositories.



## Appendix 3.5: Variables and Measurement

Variable	Item	Description	References
Performance Expectancy (PE)	PE1	Using digital library will improve my performance in the assignment/ research.	Venkatesh, Morris, Davis, & Davis (as cited in Khechine, Lakhal, Pascot, & Bytha, 2014)
	PE2	Using digital library enables me to accomplish my assignment/ research more quickly.	
	PE3	Using digital library makes my assignment/ research activities easier.	
	PE4	Using digital library enhances my effectiveness in my assignment/ research activities.	
	PE5	Using digital library increases my productivity in my assignment/ research activities.	
Effort Expectancy (EE)	EE1	Learning to use the digital library is easy for me.	Venkatesh, Morris, Davis, & Davis (as cited in Chang, 2013)
	EE2	I find the digital library easy to use.	
	EE3	It is easy for me to become skillful at using the digital library.	
	EE4	The use of digital library is understandable.	Venkatesh, Morris, Davis, & Davis (as cited in Awwad & Al-Majali, 2015)
	EE5	I find it easy to get the digital library to do what I want it to do.	Davis (as cited in Cheng, 2014)
Social Influence (SI)	SI1	People who are important to me think that I should use digital library.	Venkatesh, Morris, Davis,

	SI2	People who affect my learning think that I should use digital library.	& Davis (as cited in Awwad & Al-Majali, 2015)
	SI3	I expect to use digital library because people around me do.	& Al-Majali, 2015)
	SI4	I would use digital library if it was recommended to me by my lecturers.	Venkatesh, Morris, Davis, & Davis (as cited in Abu-Al-Aish & Love, 2013)
	SI5	In general, the university has supported the use of the digital library.	Wang & Shih (as cited in Lwoga & Komba, 2014)
Facilitating Conditions (FC)	FC1	I have the knowledge required to use digital library.	Venkatesh, Morris, Davis, & Davis;
	FC2	I have the internet connection to access digital library.	Venkatesh, Thong, & Xu;
	FC3	I have the equipment (laptops, gadgets, smart phones, etc.) to access digital library.	Indrawati, Murugesan, & Raman;
	FC4	I can get aid assistance from university (helpdesk) when there are obstacles in the use of digital library.	Indrawati; Wong, Tan, Loke, & Ooi;
	FC5	I can get aid assistance from friends and family when there are obstacles in the use of digital library.	You; Foon & Yin-Fah (as cited in Indrawati & Haryoto, 2015)

Hedonic Motivation (HM)	HM1	Using digital library is more satisfying than using traditional library.	Venkatesh, Thong, & Xu (as cited in Gerhart, Peak, & Prybutok, 2015)
	HM2	Using digital library is more fun than using traditional library.	
	HM3	Using digital library is more entertaining than using traditional library.	
	HM4	Using digital library provides more enjoyment than using traditional library.	
	HM5	Using digital library makes me feel more pleased than using traditional library.	
Habit (HB)	HB1	The use of digital library has become a habit for me.	Limayem & Hirt (as cited in Clements, 2015)
	HB2	Using digital library has become natural to me.	
	HB3	Using digital library has become automatic to me.	
	HB4	When faced with a particular assignment/ research, using digital library is an obvious choice for me.	
	HB5	Using digital library is something I do without thinking.	Verplanken & Orbell (as cited in Wohn, 2015)
Information Quality (IQ)	IQ1	The digital library provides sufficient information to accomplish my tasks.	Schaupp, Bélanger, & Fan; Kim, Lee, & Law (as cited in Chen & Chengalur-Smith, 2015)
	IQ2	The digital library provides accurate information.	
	IQ3	The digital library provides up-to-date information.	

	IQ4	The digital library provides high quality information.	Liu, Huang, & Zhu, 2008
	IQ5	The digital library provides information that is helpful.	Schaupp, Bélanger, & Fan; Kim, Lee, & Law (as cited in Chen & Chengalur-Smith, 2015)
Behavioural Intention (BI)	BI1	I intend to take full advantage of digital library.	Martins & Kellermanns (as cited in Lin, Zimmer, & Lee, 2013)
	BI2	I intend to continue using the digital library in the future.	Bhattacharjee; Thong, Hong, & Tam; Lin, & Wang (as cited in Cheng, 2014)
	BI3	I will use the digital library on a regular basis in the future.	
	BI4	I will frequently use the digital library in the future.	
	BI5	My intentions are to continue using the digital library than using any alternative means (traditional library).	
	BI6	The probability that I will use digital library again is high.	Zhou, Lu, & Wang (as cited in Chang, 2013)
	BI7	The likelihood that I would recommend digital library to a friend is high.	

Source: Developed for the research

Appendix 3.6: Survey Questionnaire

# Behavioural Intention of Undergraduates to Adopt Digital Library: An Investigation into Private Universities in Malaysia

## Survey Questionnaire

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The aim of this survey is to conduct a research to explore the **factors affecting behavioural intention of undergraduates to adopt digital library** in Malaysia. Kindly answer all questions completely and accurately. All responses will be kept confidential.

Your participation is greatly appreciated.

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Instructions:

- 1) There are THREE (3) sections in this questionnaire. Please be reminded to answer ALL questions in ALL sections.
- 2) Completion of this form will take you less than 10 minutes.

**Section A: Demographic Profile**

*In this section, we would like you to fill in some of your personal details. Please tick (✓) only ONE (1) box for each question.*

QA 1: Gender:

- Male       Female

QA 2: Age:

- 19 years old or below  
 20-21 years old  
 22 years old or above

QA 3: Race:

- Chinese       Indian       Malay

QA4: Current year of study:

- Degree Year 1       Degree Year 2       Degree Year 3  
 Degree Year 4       Degree Year 5

QA5: State of university:

- Melaka       Selangor       Perak       Sarawak

QA 6: Name of university:

- Multimedia University  
 Universiti Tunku Abdul Rahman (Sungai Long)  
 Universiti Tunku Abdul Rahman (Perak)  
 Curtin University

QA 7: Experience of using digital library (online library):

- Yes       No

QA 8: Frequency of using digital library:

- Low (1-2 days per week)  
 Moderate (3-4 days per week)  
 High (5-7 days per week)  
 None of the above

QA 9: Would you prefer to use search engine or digital library when doing assignment or research?

- Search engine (Google/ Bing/ Yahoo!/ Baidu/ Ask.com)  
 Digital library

## Section B: Modified UTAUT2

*This section is seeking your opinion regarding the factors of affecting behavioural intention to adopt digital library. Please circle ONE (1) number per line to indicate the extent to which you agree or disagree with the following statements using 5-point Likert scale [(1) = strongly disagree; (2) = disagree; (3) = neutral; (4) = agree; and (5) = strongly agree] response framework.*

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>PE</b>	<b>Performance Expectancy</b>					
PE1	Using digital library will improve my performance in the assignment/ research.	1	2	3	4	5
PE2	Using digital library enables me to accomplish my assignment/ research more quickly.	1	2	3	4	5
PE3	Using digital library makes my assignment/ research activities easier.	1	2	3	4	5
PE4	Using digital library enhances my effectiveness in my assignment/ research activities.	1	2	3	4	5
PE5	Using digital library increases my productivity in my assignment/ research activities.	1	2	3	4	5
No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>EE</b>	<b>Effort Expectancy</b>					
EE1	Learning to use the digital library is easy for me.	1	2	3	4	5
EE2	I find the digital library easy to use.	1	2	3	4	5
EE3	It is easy for me to become skillful at using the digital library.	1	2	3	4	5
EE4	The use of digital library is understandable.	1	2	3	4	5
EE5	I find it easy to get the digital library to do what I want it to do.	1	2	3	4	5
No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>SI</b>	<b>Social Influence</b>					
SI1	People who are important to me think that I should use digital library.	1	2	3	4	5
SI2	People who affect my learning think that I should use digital library.	1	2	3	4	5

SI3	I expect to use digital library because people around me do.	1	2	3	4	5
SI4	I would use digital library if it was recommended to me by my lecturers.	1	2	3	4	5
SI5	In general, the university has supported the use of the digital library.	1	2	3	4	5
No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>FC</b>	<b>Facilitating Conditions</b>					
FC1	I have the knowledge required to use digital library.	1	2	3	4	5
FC2	I have the Internet connection to access digital library.	1	2	3	4	5
FC3	I have the equipment (laptops, gadgets, smart phones, etc.) to access digital library.	1	2	3	4	5
FC4	I can get aid assistance from university (helpdesk) when there are obstacles in the use of digital library.	1	2	3	4	5
FC5	I can get aid assistance from friends and family when there are obstacles in the use of digital library.	1	2	3	4	5
No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>HM</b>	<b>Hedonic Motivation</b>					
HM1	Using digital library is more satisfying than using traditional library.	1	2	3	4	5
HM2	Using digital library is more fun than using traditional library.	1	2	3	4	5
HM3	Using digital library is more entertaining than using traditional library.	1	2	3	4	5
HM4	Using digital library provides more enjoyment than using traditional library.	1	2	3	4	5
HM5	Using digital library makes me feel more pleased than using traditional library.	1	2	3	4	5



No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>HB</b>	<b>Habit</b>					
HB1	The use of digital library has become a habit for me.	1	2	3	4	5
HB2	Using digital library has become natural to me.	1	2	3	4	5
HB3	Using digital library has become automatic to me.	1	2	3	4	5
HB4	When faced with a particular assignment/research, using digital library is an obvious choice for me.	1	2	3	4	5
HB5	Using digital library is something I do without thinking.	1	2	3	4	5
No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>IQ</b>	<b>Information Quality</b>					
IQ1	The digital library provides sufficient information to accomplish my tasks.	1	2	3	4	5
IQ2	The digital library provides accurate information.	1	2	3	4	5
IQ3	The digital library provides up-to-date information.	1	2	3	4	5
IQ4	The digital library provides high quality information.	1	2	3	4	5
IQ5	The digital library provides information that is helpful.	1	2	3	4	5

### Section C: Behavioural Intention

*This section is seeking your opinion regarding the **impacts of influencing factors given (modified UTAUT2) on the behavioural intention.** Please **circle ONE (1) number per line** to indicate the extent to which you agree or disagree with the following statements using 5-point Likert scale [(1) = **strongly disagree**; (2) = **disagree**; (3) = **neutral**; (4) = **agree**; and (5) = **strongly agree**] response framework.*

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>BI</b>	<b>Behavioural Intention</b>					
BI1	I intend to take full advantage of digital library.	1	2	3	4	5
BI2	I intend to continue using the digital library in the future.	1	2	3	4	5
BI3	I will use the digital library on a regular basis in the future.	1	2	3	4	5
BI4	I will frequently use the digital library in the future.	1	2	3	4	5
BI5	My intentions are to continue using the digital library than using any alternative means (traditional library).	1	2	3	4	5
BI6	The probability that I will use digital library again is high.	1	2	3	4	5
BI7	The likelihood that I would recommend digital library to a friend is high.	1	2	3	4	5

**~We sincerely appreciate your highly valuable responses~**

Appendix 3.7: Permission Letter**UNIVERSITI TUNKU ABDUL RAHMAN**

Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

17<sup>th</sup> March 2016**To Whom It May Concern**

Dear Sir/Madam

**Permission to Conduct Survey**

This is to confirm that the following students are currently pursuing their *Bachelor of Commerce (HONS) Accounting* program at the Faculty of Business and Finance, Universiti Tunku Abdul Rahman (UTAR) Perak Campus.

I would be most grateful if you could assist them by allowing them to conduct their research at your institution. All information collected will be kept confidential and used only for academic purposes.

The students are as follows:

<u>Name of Student</u>	<u>Student ID</u>
Kiing Siew Ming	13ABB00100
Chiong Chui Ping	13ABB00098
Ler Yu Ping	12ABB02006
Lim Qiao Joe	13ABB00097
Wong Ying Jie	13ABB00096

If you need further verification, please do not hesitate to contact me.

Thank you.

Yours sincerely,

Ms Ching Suet Ling  
Head of Department,  
Faculty of Business and Finance  
Email: chingsl@utar.edu.my

Dr Krishna Moorthy Manicka Nadar  
Supervisor,  
Faculty of Business and Finance  
Email: krishnam@utar.edu.my

Appendix 5.1: Local Student Population of Malaysian Private Universities for  
2014 (Extracted)

<b>University</b>	<b>States</b>	<b>Local Student Population</b>	<b>Total</b>
Open University Malaysia (OUM )	Selangor	39,394	39,394
Universiti Tunku Abdul Rahman (UTAR)	Petaling Jaya, Selangor	2,715	24,492
	Sungai Long	2,412	
	Kuala Lumpur	3,958	
	Perak	15,407	
Multimedia University (MMU)	Melaka	10,490	18,337
	Cyberjaya, Selangor	7,847	
Curtin University	Sarawak	3,118	3,118

Adapted from: Department of Higher Education, 2015

Note: Although OUM has the largest student population, it was not chosen due to inability to access the data as OUM conducts most classes online. UTAR and OUM were ranked second and third largest private university in terms of the number of students respectively. On the other hand, Curtin University was the largest private universities in East Malaysia. As a result, the study would investigate into these three universities.