

# **BookMyne Application as a Tool for Accessing Library Catalogue On-The-Go by Undergraduate Students in International Islamic University Malaysia**

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## **ABSTRACT**

This study explored the levels of awareness and procedural knowledge of undergraduate students in IIUM, Gombak and examined the levels of students' intention to use BookMyne as a library search tool that can allow users to access the library catalogue on the go. The study employed Rogers' (2003) conception of knowledge and Davis' (1989) technology acceptance model (TAM) as its theoretical background. A total of 415 students (228 females and 187 males) from 8 kulliyahs in the IIUM Gombak campus participated in the survey. A self-developed questionnaire with 20 items measured three major constructs of interest, i.e. awareness knowledge, procedural knowledge and intention to use, on a 5-point Likert scale. The items were first content validated by experts and pilot tested before being administered to the respondents. The data were analyzed quantitatively using descriptive statistics, Pearson's product moment correlation and multiple regression analysis. The results showed that IIUM students have low levels of awareness and procedural knowledge of BookMyne, but despite having low knowledge of the system, they demonstrated a high level of intention to use the system. Knowledge and Intention to use was found to be significantly correlated with awareness and procedural knowledge with strong positive associations. In addition, the results of the multiple regression analysis revealed that procedural knowledge positively predicted student intention to use BookMyne. The findings have important implications on how the IIUM library management and instructional technologists could devise a systematic strategy to improve students' knowledge of BookMyne in order to increase their use of the library catalogue. Besides that, this study has strategic implication in assisting the students to acquaint themselves in gaining access to library resources anywhere, anytime and at any place which by implication enhance their learning within and outside the classroom.

### **Keywords**

Awareness Knowledge, Procedural Knowledge, TAM Model, Diffusion of Innovation, BookMyne, Digital Resources

## **Introduction**

Exponential growth in the use of smartphones and tablets has brought about opportunities for phone users to increase their level of accessibility to library resources (Wong, 2013). According to a study on student attitudes towards mobile library services for smartphones by Paterson and Low (2011), it was found that students were drawn towards using mobile library services due to the intense growth of smartphone usage. With the rapid adoption of smartphones, the use of libraries has now transformed into a modern digitalized system, as compared with traditional access to library databases. Many technological facilities have been introduced into the library system that has paved the way for books and materials. Libraries must take note of the powerful growth of mobile devices as a tool, which interfaces, to the Internet as a capital challenge (Jingru, 2013). As phone screens take center stage in the fulfillment of user needs and expectations, there is a need to make use of this advantage and bring about change that would complement the opportunity at hand.

Mobile learning assists students in many a positive direction (Khomokhona 2011; Gray, 2011; Vázquez-cano, 2014). Library users can access it without stepping into the library (Sivathaasan, 2013; Onuoha &Subair, 2013). Undergraduate students make use of the library to seek information (Soria, Fransen & Nackeru, 2013; Gunasekera, 2011). Students have positive attitudes concerning the use of mobile applications for learning, hitherto, most students tend to use mobile applications for downloading English language dictionaries and games. Therefore, there is the need to enlighten students and teachers to be aware of the importance attached to the use of their smartphones for

education purposes. Mobile phones, especially smartphones, dominate the day to day routine of human endeavors. According to Canuel and Crichton (2011), in their study on Canadian academic libraries and the mobile web, only 14% of the Association of Universities and Colleges of Canada (AUCC) libraries were currently advertising using mobile web presence, where mobile websites had become prevalent over downloadable applications. In tandem with this current trend, the IIUM has expended a large amount of resources to keep its library up to date so as to meet global standards. For this reason and many others, the library subscribes to one of the world's leading library

technological facilities, SirsiDynix. Every semester the IIUM organizes an orientation for new intake students regarding the use of the library and its facilities.

Access to information has become easy as a result of new technologies. This, according to the researchers, will make communication very convenient and timely for users in the office or at home or anywhere while on the go with their smartphones (Abdul Karim, Darus & Hussin, 2006). In 2008, a survey was conducted in the Ryerson University Library where the results of the study indicated that smartphones were owned by approximately 20 percent of students, but the projection was said to reach 80 percent by 2011. In order for university libraries to remain relevant, it is important for them to adapt their services to these new changes in this digitally enhanced learning environment (Wilson & McCarthy, 2010).

The use of BookMyne application to access library has a significant implication in teaching and learning, it enhances learning from within and outside the classroom. This is because, the interface of the tool integrated to library system offers mobile access to the library catalogue, considering the huge task place on student in today's academic environment, student can save time going to library checking for books, placing holds, renewing books, and finding recommended titles. All these functionalities could be performed by students to enhance their learning using the tool. BookMyne is one form of application software that can be found in app stores (android, apple, Microsoft). Mobile technology such as smartphone could have significant contribution to undergraduate students; some of these devices might offer possibilities to enhance teaching and learning (Bomhold, 2014).

As mobile phones become an important obligatory tool for a day to day affairs, libraries seized this opportunity to accommodate their patrons by providing mobile services that enhance easy access to their resources. Undergraduate students increasingly use mobile technology to enhance teaching and learning. BookMyne helps reach to fine books and other materials from library quickly. Students can easily get information they require with use of BookMyne to enhance their knowledge through reading and gaining access to enough materials, just like searching information online through database. According to Bomhold (2014), 73% of students prepare accessing library using smartphone to search for learning materials, new titles and reservation.

## **Problem Statement**

Research on the use of mobile hand-held devices to access library resources for academic purposes by students of institutions of higher learning shows positive results (Lippincott, 2010; Cummings, Morrill & Borrelli 2010; Koulikoudi, 2008). Therefore, students in the IIUM are not an exception; practically all the students make use of a hand-held mobile device with Wi-Fi enabled capabilities. Abdul Karim, Darus and Hussin (2006) revealed that a significant number of the respondents showed their willingness to become users of the wireless services rendered by the libraries. Bomhold (2014) mentioned that the perception of undergraduate students of the usefulness of smartphones for academic purposes is increasing, and now there is a growing number of mobile apps in the library system. Factors like users' needs, speed of Internet connectivity, provision of easy access to databases, training programmes, and organizing orientation to students and staff on the use of e-library resources should be given more emphasis while subscribing with providers of library services (Velmurugan, 2013).

Meanwhile, different studies indicated that factors such as high income and low income, easy access to the Internet and demographic variables such as age, gender, level of study and educational qualification affect students' level of awareness (Arbaat, Norshariani & Sharifah Intan, 2010; Goel, Bansal, Pathak, Sharma, Luthra & Agarwal, 2012; Ellis, 2012; Awan & Abbasi, 2013; Pathmanathan & Lakshmanan, 2014; Azhari, *et al*, 2013). Moreover, a number of studies indicated that students have low levels of procedural knowledge (Huang, 2010; Surif, Ibrahim & Mokhtar, 2012; Lanzer & Taatgen, 2013). Many studies validated the original constructs of TAM as significant predictors of intention to use (Omar & Putit, 2012; Praveena and Thomas, 2013; Shafinah *et al*, 2013; Shroff, Deneen & Ng, 2011; Punnose, 2012).

The need for an empirical investigation is paramount with a view to identifying students' knowledge of BookMyne. There are many studies on the digitization of libraries in different countries and regions of the world, many of which were conducted in the developed world like the United States of America and several European countries where libraries are extensively used for intellectual development. Furthermore, very few studies have been carried out on the use of BookMyne. This is due to the fact that BookMyne is a relatively new application. Consequently, here in

Malaysia there are very few studies on the digitization of libraries, whereby in the case of International Islamic University Malaysia, no research has been carried out on BookMyne up to this date, despite its adoption for campus-wide usage. Therefore, an investigation is considered necessary to examine the awareness and procedural knowledge of BookMyne as predicting factors of students' intention to use BookMyne at the IIUM.

### **Objectives of the Study**

The main objectives of this study were to explore the level of IIUM students' awareness and procedural knowledge of BookMyne, which is a service, provided by the IIUM library Gombak campus to access the library catalogue on the go, and to identify the relationship between these two types of knowledge. In addition to that, the study also sought to ascertain whether awareness and procedural knowledge are significant predictors of IIUM students' intention to use BookMyne.

Given the aforementioned research objectives, this research work aimed at answering the following questions:

- i What are the levels of IIUM undergraduate students' awareness knowledge, procedural knowledge and intention to use BookMyne?
- ii Is there a statistically significant relationship between awareness and procedural knowledge of IIUM undergraduate students?
- iii Are awareness and procedural knowledge significant predictors of IIUM undergraduate students' intention to use BookMyne?

### **Theoretical Framework**

Two theories were employed in this study to conceptualize the main constructs, i.e. Rogers' theory of Diffusion of Innovation (DOI) and Davis' (1989) Technology Acceptance Model (TAM). The researcher worked with the aspect of knowledge in Rogers' theory, i.e. awareness and procedural knowledge, and the intention to use construct from Davis' TAM. The present study was designed to explore the levels of IIUM students' awareness and procedural knowledge of BookMyne. Rogers' theory of diffusion of innovation was chosen as one of the bases for this study and was used to derive the two types of knowledge treated as the main constructs under study. Awareness-knowledge according to Rogers is the degree to which an adopter of an innovation has the information that an innovation exists. This type of knowledge motivates an individual to seek the other type of knowledge. This determines the individuals' willingness or unwillingness to adopt an innovation. For instance, the adopter may not seek more knowledge about an innovation if he or she comes across the new idea, product, or service by accident. Awareness-knowledge helps an individual know the other two types of knowledge. An individual should have sufficient level of how-to-knowledge to increase the chances of adoption prior to the trial of innovation functioning principle describing how and why innovation works (Sahin, 2006).

### **Literature Review**

A review of related literature discussed relevant research studies, the theory of diffusion of innovation and the technology acceptance model.

#### **Library and Mobile Applications**

Undoubtedly, a growing number of academic libraries are moving toward offering mobile services to their numerous users. Mobile versions of library websites were created by libraries to offer various services which include text messaging, system to reach out to patrons, mobile catalogue search, access to library resources, etc. (Hu & Meier, 2010). The availability of functions of mobile devices at academic libraries proved that libraries had some level of research tasks available but not all libraries offered full range of services that include mobile technology (Bomhold, 2015). Canuel and Crichton (2015) discovered that research universities tend to leverage on mobile apps more frequently than the smaller ones. Similarly, the result of the study indicated that the use of mobile Apps in the libraries was identified as potential areas of future development. Igleasias and Meesangnil (2011) postulate that the introduction of Apple's App store in 2008 made many business organizations create their own mobile application to enhance their activities. Academic libraries have developed their own Apps that can be used to access the various library resources with a mobile device. It is interesting that Chang's (2013) study on integrating the unified theory of acceptance and usage of technology (UTAUT) with technology fit on user behavior intention of using library mobile

application in university libraries found that UTAUT model fit the data well. The study also revealed that the variables under study, facilitating condition, social influence, performance expectancy, and effort expectancy, determine user behavior intention of using library mobile Apps. The study, however did not link users' intention to use the mobile apps with knowledge of the apps.

### **Use of Library by Undergraduate Students**

Academic libraries are the means through which research and scholarship are being promoted in the higher institutions of learning. In a study done by Koech *et al.* (2015), high proportion of undergraduate students (87%) have utilized the library in the past one month whereas greatly lower than 13% of the students did not. This shows that a greater number of undergraduate students patronized the library. Academic libraries are considered to be the blood life of students' academic life through the provision of a better academic experience to them. Kot and Jones, (2015) in a study on the utilization of the library by students found that use of library resources by undergraduate students improved their academic performance. Academic libraries have immense contribution to knowledge and its users especially in terms of providing the required information and services. Undergraduate students were satisfied with the competence of the library staff, library environment and other services rendered by the library (Sivathaasan, 2013). Libraries especially that of universities can be used as source of information from outside the library with the use of technology (Onuoha&Subair, 2013). There is correlation among undergraduate students library use, with their search skills, knowledge of library resources, and attitudes (Karunanayake,n.d.). It was discovered that students prefer the use of electronic materials than the use of printed media (Wu & Yeh, 2012). Even though a majority of the students lack confidence on the frequent use of electronic media but they still maintained that its usage is important to their studies. According to Soria, Fransen and Nackerud (2013) in a study on the outcome of undergraduate students use of library, first-time first-year UG students who used the library got higher GPA compared to their counterparts who did not. There is correlation between demographic variables and several dimensions of library usage among undergraduate students in UK Universities (Stone & Collins, 2013). Usually demographic variables like gender, age, levels of education, and socio economic status plays significant roles in many researches around the world. Majority of the respondents were aware of the use of electronic journals and other e-resources in the library (Velmurugan, 2013). Cooke and Rosenthal (2011) revealed that in-class library instruction makes students cite sources emanated from reading books and journals from the library. Gunasekera (2011) found out that undergraduate students were satisfied with the available resources and services rendered in the library even though the students do not adequately harness the resources and services

### **BookMyne Application**

BookMyne is one of the library technologies created by SirsiDynix in December 2011 to bring their collections to different communities. According to SirsiDynix official website, SirsiDynix is a committed library partner around the world, whose story began in Northwestern University in the United States of America where they developed a system to automate its library card catalogue in the 1960s. It was during that time that the company became fully committed in the scene of library technology facilities development to libraries throughout the world. Today, the company is partnered with more than 23,000 library facilities in more than 70 countries with over 300 million users worldwide. A study conducted on the application of BookMyne in the National Institute of Education in Singapore reflected the positive perception of the application. The institution, in collaboration with SirsiDynix, has integrated the application of BookMyne for the NIE community (Wang, 2015). Lack of library services for people with disabilities was shown as a possible barrier to comfortably access the library, but many recently introduced steps toward improvement, and developing Greek libraries have provided possible solutions (Koulikourdi, 2008). As an international institution, IIUM is all embracing of people, and those with disabilities are no exception. Basically, it appears that physically challenged patrons do tend to find it difficult to constantly visit the library (Echezona, Osadebe & Asoqwa, 2011). With the introduction of BookMyne, they would find it easy because the need to present oneself at the library is minimal and one can access the library catalogue everywhere and at any time. In order to login to BookMyne, users need their library cards and pin numbers ready. With BookMyne, one should able to create a reading list that is directly linked to the catalogue. Users can also renew their items and view everything they have checked out.

There are a number of mobile Apps that are being employed by different libraries around the world to access library e-resources. According to the library success website, the applications used by those libraries to access their library catalogue were AML college, EbscoHost, Acsmobile, ebrary, Mango Languages, NML, NFB Films, pisScore, RSC

Mobile, SciVerse Science Direct, SciVerse Scopus Alerts, Sprinklink, UNCountry Stats, etc. All of these mobile device applications can be accessed through Android or iPhone stores. Similarly, these applications have different authentication processes, for instance, one of the fundamental aspects of gaining access to any of these Apps is to become a registered member or institutional member. This may require email or a special pass code to access the library platform. Just like BookMyne, the AML college authentication process needs a password, institutional email to retrieve password to access the library and update resources. eLibrary can be accessed through Android or iPhone platform, while Science Direct could be accessed by becoming a registered member in their website or if an institution is in partnership with their organization, the online database could be accessed by entering the user name or institutional email in the relevant space provided on the app.

### **Theory of Diffusion of Innovation**

The history of diffusion research goes as far back as 1903. The proponent of the theory was a French sociologist, Gabriel Tarde, who is well known for his S-shaped curve of innovation diffusion. The S-shaped curve is paramount in a diffusion research because almost every diffusion research has a small amount of S-shape rate of adoption (Rogers, 2003). In the 1960s there was an explosion of diffusion research and it was brought to the public interest by Everett Rogers. In his book, *Diffusion of Innovation (DOI)* was the theory that Rogers promoted. Rogers developed the theory of diffusion of innovation to find out by what means and rate new ideas and technology spread through social systems. Rogers argued that Diffusion is the process whereby an innovation is communicated through certain channels over time amongst members of a social system.

### **Technology Acceptance Model**

The field of information technology uses different theoretical approaches like the Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), the Innovation Diffusion Theory and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Praveena & Thomas, 2013; Alharbi & Drew, 2014). Basically, many theories have been proposed to established factors that would enhance the adoption or acceptance of technology. The fundamental factors that guide these factors however comprise both external and internal elements. Although TAM is widely used in the field of technology adoption, there are currently existing theories that play an equal role which are especially used for the measurement of acceptance of technology these are: Theory of Reason Action, Theory of Planned Behaviour (Ajzen, 2010), Innovation Diffusion Theory (Rogers, 2003), Unified Theory of Acceptance and Use of Technology (Venkatesh, Thong, & Xu, 2012). The TAM was modified from TRA model and adopted by the field of information technology system (IS), to explain and predict individual acceptance of technology. The technology acceptance model (TAM) is theorized to support the acceptance and use of technology; this model has gained wide recognition in the information system (IS) discipline. The model is based on the two main beliefs of Perceived Usefulness (PU) and Perceived Ease of Use (PEoU) which examine how external factors such as training affect internal belief, documentation, attitudes, and intention (Davis, 1989). The model is found to be very reliable in terms of acceptance of technology. In this study, one of the TAM external variables (intention to use) was adopted as a construct to explore the level of IIUM undergraduate students' Intention to use BookMyne.

### **Awareness Knowledge**

The term awareness refers to the level of knowledge gained through one's own understanding (Awan & Abbasi, 2013). Different studies indicate that there are many factors that affect students' level of awareness (Arbaat, Norshariani & Sharifah Intan, 2010; Goel, Bansal, Pathak, Sharma, Luthra, & Argarwal, 2010; Ellis, 2012; Awan & Abbasi, 2013). Socio-economic factors such as high income and low income have greatly influenced awareness. Similarly, students' environmental awareness, knowledge and attitudes are affected by socio economic factors. A study on language awareness proved that language has a direct impact on students' learning behavior (Ellis, 2012). Results of a study on awareness of HIV/AIDS concluded that there is a significant relationship between knowledge, awareness and attitudes (Arbaat, et al., 2010). The results of studies proved that students are well aware of their environment (Al-Junaibi & Khan, 2011; Acquah, 2011). A study on the awareness of knowledge management (KM) among SMEs in Iran indicated that there is medium awareness of KM among them, which includes the lack of basic knowledge of pursuing a KM approach. Apart from this, it has also been observed that most of the respondents were not computer literate and this hindered IT solutions in their organization.

## Procedural Knowledge

In order to understand the true meaning of knowledge, one has to represent knowledge in two forms (Rittle-Johnson & Schnieder, 2012). Procedural knowledge means knowing how to do something, while knowing that something is either true or false refers to declarative knowledge. Rittle-Johnson et al. (2012) further argue that knowledge is subdivided into two major categories: tacit and explicit knowledge. These can be simply identified as informal and formal types of knowledge; the former is procedural knowledge while the latter is declarative knowledge. Several studies on the concept of procedural and conceptual knowledge show positive correlations (Anderson & Taraban, 2015; Thomson, 2010; Ormeci, 2012; Hutkanri & Zakaria, 2012; Hutkanri & Zakaria, 2014) for both high and low performing students who understood the mathematics concept and procedure (Anderson et al. 2015). There is a significant difference in conceptual and procedural knowledge of students. However this result is based on the student group (Hutkanri et al, 2014).

## Intention to Use

The current study was aimed at exploring the levels of IIUM students' awareness and procedural knowledge of BookMyne as well as intention to use it as a library search tool. The theory has been applied in so many disciplines to investigate and predict a phenomenon, such as accounting, engineering, agriculture, economics, and management. The current study was built on the existing literature to study its applicability to teaching and learning although there are few empirical studies that look at the phenomenon with regards to education. This study will be one of the few among the studies that have been conducted in the education field. A number of studies validated the original findings of the technology acceptance model (Abadi, Ranjbarian, & Zade 2012; Lee, Park, Chung & Blakency, 2012). As put forward in the study on the factors influencing usage intention towards mobile financial services, factors like personal innovativeness significantly influence perceived ease of use. Also a study on attitude and intention toward Internet banking proved that all the three major variables in TAM (PEU, PU and PE) influence intention to use Internet banking. It is confirmed that TAM variables are predicting factors of consumers' intention to adopt mobile banking (Abadi et al., 2012). Similarly, a number of empirical research studies on theories of the acceptance of technology revealed that variables in the models are significant predictors of behavioral intention (Omar & Putit, 2012; Tsai, 2012; Praveena & Thomas, 2014; Shafinah, et al., 2013; Shroff, Deneen & Ng, 2011; Punnose, 2012). The result of analysis of data indicated that the significant predictors of behavioral intention (BI) to engage in e-learning are PU, PEU and social norms (Tsai, 2012). In addition, a study on consumers' behavioral intention to use e-books states that PU and attitude toward using e-books have a positive effect on using e-books. The results also showed that PEU does not have a significant effect on attitudes toward using e-books (Punnose et al., 2012). Perceived ease of use was shown to have a positive impact on attitude towards perceive usefulness (Shroff, Deneen, & Ng, 2011).

## Methodology

The research employed the ex-post facto design, which means that the data on awareness and procedural knowledge of undergraduate students were not manipulated from an experimental procedure, but were already in existence and collected from a population of undergraduate students in IIUM. The method employed in the study was the survey method using a Likert scale questionnaire as the primary means of data collection. Since the data was in the form of numbers, the study was thus quantitative in nature. An exploratory, cross-sectional survey was employed to capture the levels of IIUM students' awareness and procedural knowledge of BookMyne, and the intention to use the system as a library search tool. The rationale behind using a quantitative study in the research work was to be able to generalize the findings from the sample to the target population of IIUM undergraduate students.

**Table 1.** Breakdown of Undergraduate Students from the Eight Kulliyahs in the IIUM Gombak Campus

Kulliyah	Population		Total	%
	Female	Male		
AIKOL	1001	406	1407	9.69
KAED	684	599	1283	8.83
KENG	959	1894	2853	19.65
KENMS	1510	822	2332	16.06
KICT	320	656	976	6.72
KIRKHS	3186	1160	4346	29.93

<b>KLM</b>	256	55	311	2.14
<b>KOED</b>	792	219	1011	6.96
<b>TOTAL</b>	<b>8708</b>	<b>5811</b>	<b>14,519</b>	<b>100%</b>

Source: Academic Management and Admission Division IIUM (May 2015).

### Sample

The sample consisted of 415 undergraduate students selected from the eight kulliyahs using cluster sampling. The total number of respondents was determined using Raosoft confidence interval of 95% with 5% margin of error. There were approximately 14,519 undergraduate students in the IIUM Gombak Campus, and in order to determine the exact sample size, the researcher used the Raosoft formula for sample size. Since the sample size was expected to be drawn from students in IIUM whereby they may be in the same level, a random sampling technique was employed. The predetermined sample size in this study was adequate considering the number of students in IIUM Gombak campus. The sample size of this study consisted of year two to year five undergraduate students in IIUM Gombak campus. The choice of the sample was necessitated by the fact the number of undergraduate students outnumbered that of postgraduate students and the access to library is made easy and affordable by accessing library through the use of BookMyne at their convenient.

### Instrumentation

In this study, a self-developed questionnaire measuring the three major constructs, i.e. awareness knowledge, procedural knowledge and intention to use, was used. The questionnaire measured the two levels of knowledge based on Rogers’ (2003) conception of knowledge and Davis’ (1989) intention to use. The items in the self-developed questionnaire measured different constructs where Rogers’ (2003) and Davis’ (1989) theories formed the basis on which awareness knowledge, procedural knowledge and intention to use were conceptualized. Steps were taken to create the questionnaire measuring the three (3) constructs where the researcher developed a template of content validity that consisted of the constructs, their respective operational definitions, the questionnaire items, and the response categories. This template was used to seek expert judgment on the content validity of the constructs. The three (3) constructs were drawn from Rogers’ (2003) conception of awareness and procedural knowledge, while intention to use BookMyne was drawn from Davis (1989). Experts were given the questionnaire to give their opinion on the basis of perfect match, moderate match and poor match.

### Creation of Items

The items were created based on the operationalization of the three constructs under study. Alignment was ensured between the operational definition given and the items created. For awareness knowledge, seven (7) items were created, while for procedural knowledge, nine (9) items were developed. For intention to use, nine (9) items were created. Therefore, a total of 25 items were developed for the study. The items were rated on a five (5) point Likert scale ranging from Strongly Agree to Strongly Disagree. Table 3.2 shows a few examples of the items created to measure the relevant constructs.

**Table 2.** Sample Items on the Three Constructs

Construct	Sample Items	Label
<b>Awareness Knowledge</b>	▪ I heard about BookMyne from a friend.	AK_1
	▪ I heard about BookMyne from a tutor.	AK_2
	▪ I heard about BookMyne from a library guide.	AK_3
<b>Procedural Knowledge</b>	▪ I know how to login to BookMyne using my iOS/android mobile device.	PK_1
	▪ I know how to view e-books with the BookMyne application.	PK_2
	▪ I discovered how to check my library account with the BookMyne application.	PK_4
	▪ I discovered how to scan the book barcodes with BookMyne to check their availability in the library.	PK_9
<b>Intention to use</b>	▪ I will start using BookMyne now on my mobile device.	ITU_1
	▪ I will use BookMyne to access the library resources.	ITU_2
	▪ I will now use BookMyne to borrow books from the library.	ITU_3
	▪ I will now use BookMyne to check my book borrowing status.	ITU_4



### Content Validation of Items via Expert Judgment

The items were put in a content validation template and evaluated by nine experts in three different fields. The experts constituted three librarians who are specialists on BookMyne, three educational psychologists who are knowledgeable in assessing items on intention to use, and three experts in Instructional Technology who validated the items on awareness and procedural knowledge. The experts assessed the items based on the following criteria: (i) alignment of the items with the constructs’ operational definitions; (ii) language accuracy and clarity used in the items; (iii) clarity of ideas expressed in the items, and (iv) appropriateness of the response categories.

**Table 3.** Information on Experts Involved in the Validation Process

Experts	Description	Number
Librarians	Specialist on BookMyne	3
Instructional Technologists	A lecturer and doctoral candidates in the field of instructional technology	3
Psychologists	Knowledgeable in assessing items on intention to use	3

Three (3) experts on Instructional Technology carried out the content validation of awareness and procedural knowledge items; one of them is a lecturer in Instructional Technology and the remaining two are currently doctoral students in the Kulliyyah of Education, IIUM. Both students gave similar remarks with one of them questioning the applicability of one item under awareness knowledge (I heard about Bookmyne from a research assistant).The doctoral candidate was convinced to retain the item after getting the clear meaning of the item in question. Similarly, the Instructional Technology expert opted to maintain all the items and advised making the rating scale of the construct on awareness knowledge a dichotomous one (Yes/No). This was also resolved after a Likert scale measure considering that the nature of the items used in the validation template could best.

Three librarians who are experts on BookMyne did content validation of the items. All items were accepted apart from two items under procedural knowledge (*I know how to view e-books with my BookMyne application* and *I know how to download e-books using my BookMyne application*), which were rated as not reflective of the function of BookMyne. Their rating was due to the fact that the IIUM server IP address is only accessible from laptops; in view of that all the remaining 6 items were kept but with a few modifications. One of the experts suggested that two items be added to the existing ones. These included:*I know how to install the BookMyne application on my mobile device* and *I know how to renew books using a BookMyne account*.

An expert in the field of Educational Psychology performed content validation of the intention to use items. The expert retained all the 9 items listed, but pointed out that the operational definition of Intention to Use should exclude Smartphones as none of the items had mentioned it. Based on the experts’ feedback, most items were retained while a few were deleted. Then content validity ratios (CVR) were calculated and decisions to accept or reject the item were made. Only items with a CVR of 70% or more were retained. Table 4 shows the CVRs of all the items.

### Refinement of Items

It is expected that after expert evaluation, the items observed to be deficient would be refined or removed from the list of items. With the changes made, it is expected that the researcher would have critically addressed other observations made by the team of experts. For example, the researcher removed two items (*I know how to view e-books with BookMyne application* and *I know how to download e-books using the BookMyne application*) under procedural knowledge, which were observed to be inapplicable by the librarians who are experts on BookMyne.

**Table 4.** Content Validity Ratios of Awareness Knowledge, Procedural Knowledge and Intention to Use

ITEM	EXPERT			CVR (%)	DECISION
	1	2	3		
AW_1	+	+	+	100%	ACCEPTED
AW_2	+	+	+	100%	ACCEPTED
AW_3	+	+	+	100%	ACCEPTED
AW_4	+	+	+	100%	ACCEPTED
AW_5	+	+	+	100%	ACCEPTED

AW_6	+	+	+	100%	ACCEPTED
AW_7	+	+	+	100%	ACCEPTED
ITU_1	+	+	+	100%	ACCEPTED
ITU_2	+	+	+	100%	ACCEPTED
ITU_3	+	+	+	100%	ACCEPTED
ITU_4	+	+	+	100%	ACCEPTED
ITU_5	+	+	+	100%	ACCEPTED
ITU_6	+	+	+	100%	ACCEPTED
ITU_7	+	+	+	100%	ACCEPTED
ITU_8	+	+	+	100%	ACCEPTED
ITU_9	+	+	+	100%	ACCEPTED
PK_1	+	+	+	100%	ACCEPTED
PK_2	X	X	X	0%	REJECTED
PK_3	+	+	+	100%	ACCEPTED
PK_4	+	+	+	100%	ACCEPTED
PK_5	X	X	X	0%	REJECTED
PK_6	+	+	+	100%	ACCEPTED
PK_7	+	+	+	100%	ACCEPTED
PK_8	+	+	+	100%	ACCEPTED
PK_9	+	+	+	100%	ACCEPTED
ITU_1	+	+	+	100%	ACCEPTED
ITU_2	+	+	+	100%	ACCEPTED
ITU_3	+	+	+	100%	ACCEPTED
ITU_4	+	+	+	100%	ACCEPTED
ITU_5	+	+	+	100%	ACCEPTED
ITU_6	+	+	+	100%	ACCEPTED
ITU_7	+	+	+	100%	ACCEPTED
ITU_8	+	+	+	100%	ACCEPTED
ITU_9	+	+	+	100%	ACCEPTED

After the experts (who included librarians, instructional technologists, and psychologists) reviewed the items, the researcher refined the items and conducted a pilot test.

### Pilot Study

To investigate whether the items were in conformity with the target group and to determine the reliability of the items, copies of the questionnaire were distributed to 110 undergraduate students who were randomly selected from 8 Kulliyahs in the IIUM for pilot testing. Out of the 110 questionnaires distributed, only 101 were retrieved from the respondents. The researcher personally carried out the distribution of the questionnaire. The respondents in this pilot test constituted 73% females and 27% males.

### Analysis of Pilot Data

The pilot data obtained from the 101 students were keyed into PASW/SPSS version 22 and subjected to the basic procedure involved in Principal Components Analysis (PCA) with promax rotation to identify the underlying factors of the constructs of interest measured in the study. PCA with promax rotation was applied on the data to identify reliable and interpretable items that would represent awareness knowledge (AWK), procedural knowledge (PRK) and intention to use (INT). The PCA procedures allowed the study to reduce the number of items in the questionnaire down to their principal components, which in this study would be AWK, PRK, and INT. The PCA procedure produced acceptable results in terms of sampling adequacy and inter-item correlations. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .86, indicating that the sample size relative to the number of questionnaire items was adequate for applying PCA. The Bartlett's test of sphericity was statistically significant ( $\chi^2=2309.649$ ,  $p = .001$ ), and indicated that the overall correlations within the correlation matrix were adequate. In summary, these results showed the factorability of the data, hence justifying the use of PCA in the analysis. Preliminary results of the PCA indicated that a few items cross-loaded in the pattern matrix table; thus the factor solution could not be accepted. In order to ensure that the issue was solved, some procedures were followed to ratify the problematic items. Firstly, after referring to the communalities table, four (4) items were discovered to be below

0.5. Secondly, only two items cross-loaded in the pattern matrix and lastly, those items that were discovered to be problematic were removed sequentially to get results. After PCA, five (5) items were retained as valid and reliable for awareness knowledge, six (6) items for procedural knowledge, and nine (9) items for intention to use. Table 1 shows the final factors with their respective items.

**Table 5. Finalized Items**

Factor	Item Statement	Factor loading
<b>Awareness knowledge</b>	I heard about BookMyne from a friend.	.708
	I heard about BookMyne from my lecturer.	.996
	I heard about BookMyne from a tutor.	.954
	I heard about BookMyne from a research assistant.	.701
	I heard about BookMyne from a library guide/out- reach IIUM library	.549
<b>Procedural Knowledge</b>	I learnt how to search the library catalogue with BookMyne.	.806
	I know how to renew books using BookMyne account.	.487
	I discovered how to update my library profile using the BookMyne application.	.581
	I know how to view library resource details using the BookMyne application.	.755
	I know how to hold library resources from the BookMyne application.	.855
	I discovered how to scan the book barcodes with BookMyne to check their availability in the library.	.906
<b>Intention to Use</b>	I will start using BookMyne now.	.877
	I intend to use BookMyne from this point onwards.	.909
	I would like to use BookMyne to facilitate my studies.	.924
	I will use BookMyne to access the library resources.	.913
	I will utilize BookMyne as one of the primary means to access the library resources.	.848
	I will now use BookMyne to borrow books from the library.	.92
	I will now use BookMyne to extend books from the library.	.913
	I will now use BookMyne to reserve books from the library.	.909
	I will now use BookMyne to check my book borrowing status.	.907

## Findings

The findings revealed that female respondents were the majority accounting for 54.9% of sample (n = 228), while their male counterparts accounted for 45.1% of sample (n = 228). The respondents' ages ranged between 18 and 25 with the majority being within 21 and 22 years (57%). In terms of level of study, year 2 respondents were the majority forming 61% of sample (n = 253), followed by respondents in year 3 (19.5%, n = 81). The least number of respondents were in year 5 (10.1%; n = 16). In terms of nationality, local students made up 89.6% (n = 359), while international students represented 13.5% of the sample (n = 59).

### Level of Awareness

Almost all the respondents indicated that they have low levels of awareness of BookMyne. A significant number of respondents claimed to have no knowledge of BookMyne, for instance when a question was posed on whether they had heard about BookMyne from a friend, 73% disagreed. Also 76.4% did not agree with the statement that they heard about BookMyne from a lecturer, 80% disagreed that they heard of BookMyne from a tutor, and the last two items on level of awareness show that 64.9% and 66.7% lacked awareness of the system. The overall results show that IIUM students have low awareness level of BookMyne. These findings of the results are similar to those of Clack and Pan (2014), in which 58% respondents were found to have a low level of awareness of library mobile services. Basu and Das (2012) also found out that lack of awareness is the major factor that deprived students from accessing the library services online. However, the finding contradicts Alzaza and Yaakub (2011), Fazlina, Manap, and Rias (2013), and Marwan, Madar and Fuad (2013) where the respondents were found to have an adequate level of awareness of mobile learning. There is a need for the library management to devise systematic strategies to create awareness among IIUM students, such as organizing workshops and making information about BookMyne available to the students. This is because of the importance attached to the use of BookMyne in addressing lapses in students' reading habits, especially e-reading since the era of utilization of hard copy material is fading and it is rapidly transforming into the era of e-resources and cloud storage. Since BookMyne is considered a mobile application that

can be accessed anywhere and at any time, it must be regarded as students' immediate library. Students' awareness knowledge of BookMyne is very low as a result of lack of proper information on the part of the students about the application and its uses.

### **Level of Procedural Knowledge**

The results of the findings on the level of procedural knowledge of BookMyne revealed that IIUM students in Gombak campus have inadequate procedural knowledge and this can be justified from the findings. A significant proportion of the respondents maintained having inadequate knowledge of operating BookMyne. About 66.5% of the respondents did not know how to search the library with BookMyne; 72% did not have the knowledge of renewing borrowed books with BookMyne. In addition, a majority indicated having low levels of technical know-how of BookMyne. This indication could be assumed from the large number of respondents that disagreed with the statements. Consequently, all the results were tilted toward inadequacy due to lack of awareness of the tool by the students and therefore, there is an urgent need for the library management to expose the students to how to operate the application. This can be actualized by encouraging the library representatives of each Kulliyah to enlighten, educate and state the importance attached to the use of the application, as well as organizing workshops on how to use the application. This could go a long way in addressing the problem of students' lack of procedural knowledge of BookMyne. The IIUM librarians can work closely with individuals to increase the level of this knowledge among students. In summary, there is generally inadequacy regarding IIUM students' level of procedural knowledge of BookMyne, and there is an urgent need on the part of the library management to systematically inform the students of the importance attached to the application and how it will help them to facilitate their studies and research as well as bring library resources to their doorsteps. The results generally tallied with those obtained from previous research works. For instance, there is inadequate procedural knowledge (Huang, 2010; Surif et al., 2012). In a contrasting view, Khashan (2014); Rittle-Johnson, Star & Durkin (2012); Sicignano (2011); and Bunning (2013) in their study found out that there is an adequate level of procedural knowledge.

### **Level of Intention to Use**

The overall results of the students' intention to use BookMyne indicated that it is relatively positive, where most of the respondents agreed with the statements or remained neutral. Very few disagreed with the statements. Following the findings, the respondents, despite their low level of awareness and lacking the know-how about BookMyne displayed some degree of intention to use BookMyne. This can be deduced from the positive responses to the nine items under consideration. For instance, 41.7% believed they could use BookMyne to facilitate their studies and access library resources with it. In addition, 40% agreed to use BookMyne to reserve books and other library resources in the library, and 43.6% tilted toward using BookMyne to check their book borrowing status. These results indicate that a significant number of the respondents indicated intention to use BookMyne. The aforementioned results concurred with the studies of Clack and Pan (2014) which indicate that about 85% (n = 711) of the respondents have intention to use mobile Apps for library access. In contrast, studies conducted by Kasikitsakumpmphon & Vanijja (2013) revealed that the magnitude of students' intention to use the Internet is very low. Also, Eke (2011) found that there is a lack of adequate intention on the part of the students to use e-learning, where a majority of the respondents were found to be laggards on the usage of e-learning facilities in the school. Despite the poor levels of student awareness and procedural knowledge of BookMyne, the findings of the study indicated that IIUM students are willing to adopt the use of Bookmyne. It is therefore advisable for the authorities concerned to devise a means for creating awareness thereby increasing their intention to use the tool among the IIUM students.

### **Relationship between the Independent and Dependent Variables**

The results of correlation analyses using the Pearson product moment have shown a significant strong positive relationship between the two independent variables i.e. awareness and procedural knowledge. However, a weak positive association was found between awareness and intention to use. Similarly a moderate positive association was found between procedural knowledge and intention to use BookMyne. Similar findings were also found in Aharony (2014) where there was a positive relationship between the independent variables (perceived ease of use and perceived usefulness) and intention to use mobile learning. Also a weak positive correlation was found in Huang (2010). The study revealed that the respondents know the finding of a simple procedure but could rarely explain the process involved. Therefore, the findings of all the results revealed that there is positive correlation among the

variables under study. These indicate that students’ intention use BookMyne is more likely motivated by the level of procedural knowledge compared to awareness knowledge.

**Table 6.** Correlations between the Independent Variables and the Dependent Variable

	Awareness knowledge	Procedural knowledge
Procedural knowledge	.814**	
Intention to use	.356**	.417**

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

### Predictors of IIUM Students’ Intention to Use BookMyne

A multiple linear regression model was applied on the data to extract the predictors of IIUM students’ intention to use with awareness and procedural knowledge as the independent variables. The multiple regression analysis results reflect that procedural knowledge is a significant predictor of the intention to use BookMyne among IIUM students. It shows that when students have the knowledge on how to use mobile application, they will be inclined to use it especially when they know its benefits and efficiency. Similar findings were found in a study on intention to adopt mobile technology among students in a tertiary institution where the results indicated that factors like affordability; performance expectancy and pedagogy are significant predictors of students’ intention to use mobile technology (Jambulingam, 2013). Additionally, Awan and Abbasi (2013) also found that regression analysis indicates that gender, level of education, and level of income are significant predictors of awareness.

**Table 7.** Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.348	.103		22.734	.000
Awareness Knowledge	.051	.080	.049	.638	.524
Procedural knowledge	.351	.072	.377	4.892	.000

Dependent Variable: Intention to use BookMyne; R= .412; F = 43.50, R<sup>2</sup> = .174

The regression analysis reveals that the model accounted for 17.4% of the variance in procedural knowledge with a standard error of .89. As suggested by the ANOVA results (Table 8), the overall strength of the relationship between the predictor and independent variables was statistically significant [F = 43.504, p = .001, Adj. R<sup>2</sup> = 17.4]. Table 7 presents the analysis of variance in the regression analysis indicating the predictors of intention to use BookMyne. The result shows a statistically significant relationship at .001 significance level.

**Table 8.** ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	69.284	2	34.642	43.504	.000b
Residual	328.072	412	.796		
Total	397.355	414			

a. Dependent Variable: Intention to use BookMyne

b. Predictors: (Constant), Procedural knowledge, Awareness knowledge

### Conclusion

In this study, we presented how undergraduate students’ level of awareness and procedural knowledge predicts students intention use BookMyne. We found that the students lack awareness and procedural knowledge of the tool to access library catalogue. Though they have poor knowledge of the tool they have shown interest to use the tool to search for materials to enhance their learning. This might be an opportunity for educators to encourage students to use BookMyne to enhance their teaching and learning needs without constraints of time, space, and location. In line with the results in this study, it might appeared to be feasible for teaching staff to use the tool to improve students’

habit of accessing libraries for academic purposes. It might also be advisable to teach students the functionality of the tool during their class session.

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