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Abstract

Purpose – This paper aims to examine relationships between attitude, self-efficacy and subjective norm with library patrons' behavioural intention to use public computing facilities at a library.

Design/methodology/approach – Data were collected from 200 undergraduate students enrolled at a higher learning institution in the Federal Territory of Labuan, Malaysia, via a structured questionnaire comprising closed-ended questions. A structural equation modelling technique using Analysis of Moment Structures (AMOS) computer software version 21 was used to examine the stability of the model with the data and to estimate impacts among factors instantaneously.

Findings – The results show that library patrons' behavioral intention to use public computing facilities at the library is widely affected by subjective norm factor, i.e. influence of the support of family members, friends and neighbours. Using public computers in a library helps them to be more independent in completing their assignments and conducting research collaboration, checking email messages, social networking and performing other online tasks.

Practical implications – The findings of this study provide a better understanding of factors likely to influence library patrons' behavioral intention to use public computing facilities at a library. It also offers valuable insights into factors which university librarians need to focus on to improve library patrons' behavioral intention to actively use public computing facilities at a library for quality information retrieval.

Originality/value – This study replaces perceived behavioral control with self-efficacy in the framework, as it overlaps with the concept of self-efficacy to provide more variance in behavioral intention to use public computing facilities at a library, which has been marginally researched in the Malaysian context.

Keywords Library, Attitude, Self-efficacy, Subjective norm, Behavioural intention, Public computing

Paper type Research paper

Introduction

University libraries in Malaysia, like many others worldwide, are equipped with public computing facilities, such as high-speed internet-enabled computers and high-end workstations installed with internet browsers, a variety of plug-ins, a wide range of software programs, the latest Microsoft Windows and Office Suite, Wi-Fi zones with power-charging points for personal laptops and notebooks, information kiosks and more. The computing facilities are freely accessible to all students, faculty members and staff and allow connections to networked resources through individually assigned usernames and passwords, while public visitors may login by requesting temporary authenticated access at a library service desk. Library patrons can also access the Online Public Access Catalogue to search for books or

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information sources and to search and view full text digitized content. Coonin and Younce (2010, p. 118) wrote that "open access publishing is now an accepted method of scholarly communication, although penetration of open access publishing has been much slower among the social sciences".

Library patrons use public computing facilities to retrieve information and acquire knowledge which effectively supports advanced learning, instruction and research processes by searching the internet and electronic databases (Phillips, 2011). Earlier studies (Brophy and Bawden, 2005; Sorensen and Dahl, 2008) reported that library databases are superior for quality academic information. The Gates Foundation testified that 77 million Americans use library resources to access the internet (Becker *et al.*, 2010). Encouragingly, 40 per cent of library patrons use public computing facilities at the library for reasons, such as career and employment needs, through an evaluation of potential employer profiles on social networking sites (SNSs) available on the internet. SNSs used by respondents in the study included Facebook, MySpace, YouTube, LinkedIn, Google+, Flickr and Twitter. Forty-two per cent of the surveyed population used libraries for education and training needs (ALA, 2008).

University libraries use Facebook to provide an interactive method of staying in close contact with students and to issue current information which can be accessed via public computing facilities at the library (Phillips, 2011; Riza Ayu and Abrizah, 2011). Libraries using SNSs provide an interactive environment for their clients which allows for the dissemination of new products and information services to their users (Singh and Gill, 2015) and virtual reference (Graham *et al.*, 2009; Reichardt, 2008). In Singh and Gill's (2015) study on the awareness and the extent of use of SNSs by the students and research scholars at universities in northern India, all of the respondents were found to be aware of and making use of such applications in their academic affairs. Another study noted that students predominantly desired to seek physical help from university librarians on duty for accessing quality information retrieval available in print or electronic format, as well as virtually (Abrizah *et al.*, 2015; Liyana and Noorhidawati, 2014; Robinson and Stubberud, 2012; Tang and Tseng, 2014). Indeed, "librarians are needed more than ever to guide patrons to finding reliable and valid information" (Stern and Kaur, 2010, p. 69). Hence, the information and communication technologies (ICT) infrastructures at libraries need to be strengthened to provide users with quality ICT-based services (Singh and Gill, 2015).

Previous empirical studies (Mahmood and Richardson, 2011; Ram *et al.*, 2011; Stern and Kaur, 2010) acknowledged that computer use in libraries is extensively researched in Western countries, as opposed to Malaysia. Studies tended to focus on factors related to patron attitude, subjective norms and perceived behavioural control. Globally, the relative importance of these factors in the prediction of intention varies across consumer behaviour (Ajzen, 1991). Earlier, Davis (1989) affirmed that individuals are inclined to use a system that they recognize will help them to accomplish their required task. Hence, this study examines the relationships between attitude, self-efficacy and subjective norms with the behavioural intention of library patrons to use public computing facilities at the library. Results will offer a clearer perspective for university librarians and university management in terms of:

- enabling them to identify library patron behaviour related to experience and perception in using public computing facilities at a library in Malaysia, a Muslim-majority multi-ethnic country; and
- adding to prevailing knowledge by investigating which factors significantly influence library patron intention to use public computing facilities at the library.

Eventually, these findings will hopefully result in more visits to university libraries and thus promote optimal use of e-resources and provide patrons with positive emotions during information retrieval within the Malaysia context.

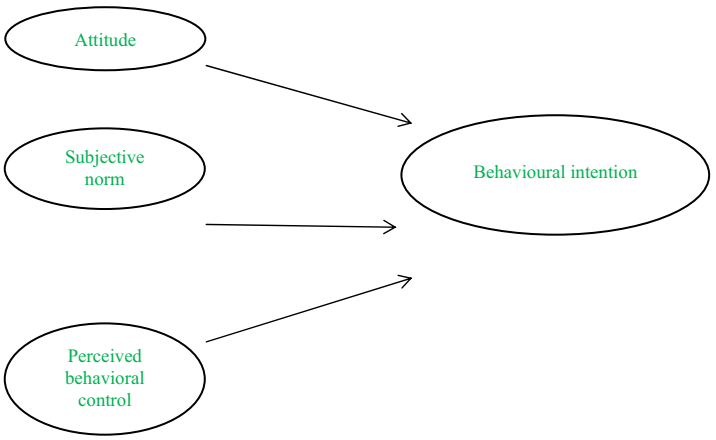
This paper first reviews the research model and outlines the hypotheses. The next section describes the method used to examine the research objectives. The paper continues with the presentation and discussion of results. The concluding section relates back to the key findings and provides a number of theoretical and managerial implications, and directions for future research.

Literature review

Theory of planned behaviour

The theory of planned behaviour (TPB) is an extension of the theory of reasoned action in the sense that individuals do not have complete acceptance or control over their behaviour while making decisions (Ajzen, 1985, 1991). In the TPB model, as illustrated in Figure 1, attitudes, subjective norms and perceived behavioural control impact individual behaviour mainly by influencing behavioural intention.

In relation to this study, TPB is chosen and treated as realistic when investigating the acceptance process of patrons using public computing facilities at a library. There are a variety of other factors that could be related to library computer use. What is new in this study is that it replaces perceived behavioural control with self-efficacy in the framework, as it overlaps with the concept of self-efficacy (Ajzen, 1991, 2002; Krueger *et al.*, 2000). The rationale is to limit the extent of the research and to provide more variance in behavioural intention to use public computing facilities at a library (Armitage and Conner, 2001). Hence,



Source: Ajzen (1985, 1991)

Figure 1.
Theory of planned behaviour

this section emphasizes these key predictors of behavioural measures from a widely accepted framework of the TPB by Ajzen (1991, 2002).

Attitudes

Attitude is defined as "the degree to which a person has a favourable or an unfavourable evaluation of the behaviour in question" (Ajzen, 1991, p. 188). This encompasses a person's behavioural intentions, either positive or negative, after conducting assessments in the form of affective (e.g. pleasant/unpleasant) and instrumental (e.g. easy/difficult) (Baker and White, 2010). Public access to computers at a library benefits individuals who do not have a computer at home to access borderless information and ICT facilities (Phillips, 2011). Individuals are disposed to use a system that they perceive useful and would help them accomplish task performance (Davis, 1989). Prior research noted that the usefulness of the system is a major determinant of the use of the system (Adams *et al.*, 1992; Davis *et al.*, 1989). Respondent attitude towards public computer usage will change if they think that the facility helps them to access useful information.

Empirical studies (Adams *et al.*, 1992; Ajuwon and Popoola, 2015; Chang and Chang, 2009; Chang *et al.*, 2009; DeMaagd *et al.*, 2013; Igbaria *et al.*, 1995; Shin, 2007; Suki and Suki, 2013; Teo, 2001) affirmed that individuals develop a positive attitude and are motivated to use the internet to access abundant information resources, such as journal articles, electronic books and databases when they find it useful and pleasurable. They also use the internet to search for questions demanding an immediate answer and for future learning (Gravatt and Arroll, 2010). Within the library computer use context, library users who are used to reading print materials request printed academic material available in the library in addition to academic resources in electronic form (Agboola, 2010; Kumar and Kumar, 2010; Islam and Panda, 2007; Shiv, 2014). In this study, a more positive attitude towards online information retrieval would lead to a greater intention to use public computing facilities at a library.

Self-efficacy

Self-efficacy refers to "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (Bandura, 1991, p. 257) which determines people's feelings, thoughts, motivation and behaviour, and drives individual motivation, life choices, quality of functioning tasks and resilience to adversity (Bandura, 1986). Both computer self-efficacy and internet self-efficacy impacted user acceptance in the learning context (Lee *et al.*, 2011; Liao and Huang, 2009). Computer self-efficacy refers to "individuals' beliefs in their own ability to use computers to perform tasks" (Compeau and Higgins, 1995, p. 189). Internet self-efficacy is a "specialized construct of computer self-efficacy within the domain of the Internet" (Igbaria and Iivari, 1995, p. 587). Self-efficacy is extensively recognized as essential to understanding work motivation where consumers with a lack of motivation could have low self-efficacy for a product trial, even though the product would benefit them (Ben-Ami *et al.*, 2014; Latham, 2012). Indeed, high self-efficacy consumers would increase their tendency to use the product and are motivated to purchase products that benefit them (Ben-Ami *et al.*, 2014; Luszczynska and Schwarzer, 2005; Mukhopadhyay and Johar, 2005).

Prior research found that self-efficacy affected a consumer's decision to undertake a specific task, effort used in performing it and the determination to complete it (DeMaagd *et al.*, 2013; Hong *et al.*, 2005), including predicting effects of searching for information in

network-based learning (Ong *et al.*, 2004) and internet use (Eastin and LaRose, 2000; LaRose *et al.*, 2007). The more experience people acquire through online instructional use of technology, the greater the tendency for them to be concerned about control over personal information (Brinkerhoff, 2006; Ong *et al.*, 2004). Scholars Bronstein and Tzivian (2013) mentioned that library and information science (LIS) professionals among their female counterparts had positive self-efficacy beliefs regarding their information retrieval skills, as they expressed more contentment, felt more energized and enjoyed information searching. However, in a study by Abrizah *et al.* (2015) on the motivation and resistance to resource-sharing through an inter-institutional repository among LIS academicians in Malaysia, LIS academicians minimally include their scholarly work and teaching resources in institutional repositories due to a lack of self-efficacy. In relation to this study, individuals with more positive self-efficacy towards online information retrieval would have greater intention to use public computing facilities at a library.

Subjective norms

Subjective norms are related to "the perceptions of what friends, family, work colleagues and neighbours think of the particular behaviour; in this case, the use of public computing facilities in the library" (DeMaagd *et al.*, 2013, p. 112). The connection between subjective norms and intention in a technology-based context has been established (Chang and Chang, 2009; Chang *et al.*, 2009; Hsu and Lu, 2007; Suki and Suki, 2013). Students use e-mail to communicate with peers and instructors in course-related discussions (Vrocharidou and Efthymiou, 2011) and to mingle with friends on Facebook (Pempek *et al.*, 2009; Singh and Gill, 2015). These social networking tools drive both the local and global research collaboration (Ali and Fulton, 2015; Gruzd *et al.*, 2012; Gu and Widén-Wulff, 2011; Rowlands *et al.*, 2011).

Past studies have shown that student views of real significance allied with the target intention are impacted by others, especially professors and peers (Chang and Chang, 2009; Chang *et al.*, 2009; Suki and Suki, 2013; Taylor and Todd, 1995). Conner and Armitage (1998) and Kim (2010) found that subjective norms were the most central factors predicting patron use of university library Web-resources, but were very weak in predicting attitude. Social influence from peers or fellow researchers motivates LIS academicians to share knowledge, intellectual profiles, scholarly work and teaching resources in institutional repositories (Abrizah *et al.*, 2015). As for students, they tend to apply more than one option to information searches, such as conducting new searches using different combinations of keywords in online databases, consulting an expert at the library, and discussing with friends if they could not locate the information that they sought the first time (Liyana and Noorhidawati, 2014). Those seeking more positive thoughts and opinions from other people regarding using a new thing, such as using public computer facilities at the library, would obtain a greater sense of encouragement and guidance for quality and speedy information retrieval.

Behavioural intention

Behavioural intention is related to people's willingness to try to perform a behaviour (Ajzen, 1991) and is found to be the most dominant predictor of behaviour in the TPB model. Unlike preceding research, this study does not split user behaviour and user intention into different dimensions and use of behavioural intention to use public computing facilities at a library as a dependent variable. This is justified by Mathieson's

(1991) study. According to Chau and Hu (2002), behavioural intention has been revealed to envisage an individual carrying out a cognizant act to accept (or use) a technology. With respect to this study, library patrons' intention to use public computing facilities at the library would be influenced by their own attitude, self-efficacy and subjective norms.

Research model and hypotheses

Based on the preceding literature, the following can be hypothesized:

H1. Attitude positively affects library patrons' behavioural intention to use public computing facilities at a library.

H2. Self-efficacy positively affects library patrons' behavioural intention to use public computing facilities at a library.

H3. Subjective norms positively affect library patrons' behavioural intention to use public computing facilities at a library.

The research model for this study is presented in Figure 2. The model postulates that attitude directly influences library patrons' behavioural intention to use public computing facilities at a library. Next, the model shows that both self-efficacy and subjective norms have direct effects on the library patrons' utilisation of public computing facilities at a library.

Methodology

Sample

A quantitative research method is applied via development of a structured self-administered questionnaire to examine factors that influence library patrons' behavioural intention to use public computing facilities at a library and to test the proposed hypotheses. The convenience sampling method was adopted for collection of primary data from 250 undergraduate students at a higher learning institution in the Federal Territory of Labuan, Malaysia, in October 2014 over a period of two weeks. Of these, 200 were completed and usable for further data analysis with a valid response rate of 86 per cent. Undergraduate students were selected because they are young people, known as *Generation Y* (born between 1978 and 1994), who are considered members of a digital generation and are

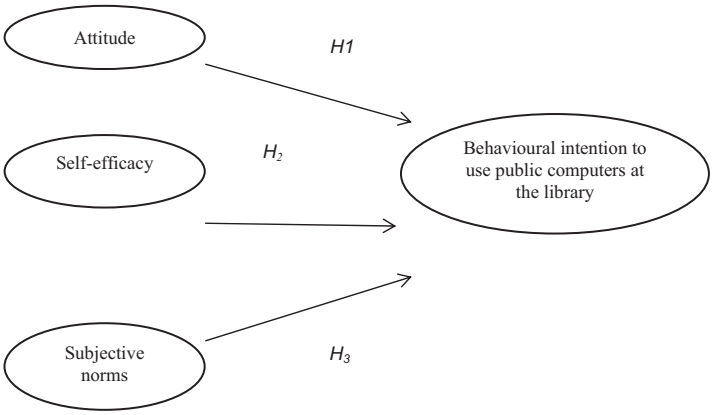


Figure 2.
Proposed theoretical framework

sufficiently computer literate, do a lot of reading via smartphone, are actively exposed to online SNSs and have a say in their parents' purchasing resolutions. Additionally, Chang *et al.* (2009) asserted that student samples are acceptable for testing causal relationships when the study does not endeavour to conclude estimates about population parameters. This further supports the use of student samples in this study.

Measures

The questionnaire comprised three parts. Section A comprised general demographic questions, relating to gender, age and level of education, while Section B contained questions about the respondents' experiences in using public computing facilities at a library. The final part of the questionnaire, Section C, required respondents to furnish responses on a multi-item measurement instrument of TPB constructs. This scale was modified in the current research study, i.e. intention to use public computing facilities at a library. In particular, measures of attitude towards computer use in libraries were adapted from Ajzen (2002), self-efficacy was adapted from LaRose and Eastin (2004), subjective norms were adapted from Rhodes and Courneya (2003), while behavioural intention was adapted from Ajzen (2002). All items were measured on a five-point Likert-type scale ranging from (1) "strongly disagree" to (5) "strongly agree".

Measures of attitude were addressed with five items:

(1) Using public computers in the library is important (A1);
(2) Using public computers in the library is worthless (A2);
(3) Using public computers in the library is enjoyable (A3);
(4) Using public computers in the library is harmful (A4); and
(5) Using public computers in the library is useful (A5).

Measures of self-efficacy consisted of four items:

(1) I feel confident in handling most problems using public computers in the library (SE1);
(2) I have no difficulty using computers in the library (SE2);
(3) I never ask help from librarians while using computers in the library (SE3); and
(4) I am able to accomplish tasks within the allocated time using public computers in the library (SE4).

Measures of subjective norms were assessed by four items:

(1) My family members think I should use public computers in the library (SN1);
(2) My friends think I should use public computers in the library (SN2);
(3) Most people who are important to me think that I should use public computers in the library (SN3); and
(4) My neighbours think that I should use public computers in the library (SN4).

Measures of behavioural intention involved six items:

(1) I intend to use the library computers again within the next week (BI1);
(2) I will use the library computers regularly in the future (BI2);

(3) I plan to use the library computers more in the future than I do now (BI3);
(4) I prefer to use the library computers for checking e-mail (BI4);
(5) I prefer to use the library computers for social networking (BI5); and
(6) I prefer to use the library computers for entertainment (BI6).

Statistical techniques

Various statistical tools and techniques were used to process the data, including simple descriptive statistics, including means and standard deviation (SD), and Pearson product-moment correlation using the Statistical Package for Social Sciences (SPSS) computer program, version 21. Additionally, a structural equation modelling (SEM) approach applying Analysis of Moment Structures (AMOS) computer software, version 21, was used to examine the steadiness of the model with the data and to estimate influences among factors concurrently, as hypothesized, with the goals of investigating the relationships between the dependent variable and independent variables, where behavioural intention was the dependent variable (also known as an *endogenous variable*), while attitude, self-efficacy and subjective norm were the independent variables (also known as *exogenous variables*).

Data analysis

The demographic profiles of the respondents, offered in Table I, indicate that slightly more women (57.5 per cent) than men (42.5 per cent) completed the survey and mainly consisted of younger respondents (74 per cent aged under 21 years), while 26 per cent were aged 22-25 years. Of the 200 respondents surveyed, more than three-quarters had benefited from higher education: 42.5 per cent had completed and passed their Malaysian Higher School Certificate/Matriculation level, 33 per cent had obtained a degree and 20 per cent received a diploma. Only 4.5 per cent had only a Malaysian School Certificate.

Experience in using public computing facilities at a library

Table II presents the descriptive analysis of the experience of respondents using public computers at a library. Twenty-one per cent had used the public computers more than eight times in the previous month. From the frequencies analysis, results further

Table I. Demographic profiles of respondents

Items	Frequency	(%)
Gender		
Male	85	42.5
Female	115	57.5
Age (in years)		
18-21	148	74.0
22-25	52	26.0
Highest level of education		
Malaysian School Certificate	9	4.5
Malaysian Higher School Certificate/Matriculation	85	42.5
Diploma	40	20.0
Degree	66	33.0

Variables	No.	(%)
Frequency of using the public computers in the library in the past month		
1-3 times	95	47.5
4-7 times	62	31.0
8-11 times	26	13.0
>12 times	16	8.0
Time spent on the library computers during an average visit		
1-10 min	54	27.0
30 min	64	32.0
45 min	28	14.0
60 min	17	8.5
>1 h	37	18.5
Alternative computer access location		
Home	90	45.0
Work	14	7.0
School	51	25.5
Another public building	42	21.0
Application that was accessed on library computers		
E-mail	32	16.0
Social networking	48	24.0
Entertainment	19	9.5
News	10	5.0
Online shopping	11	5.5
Searching library resources	57	28.5
Job search	5	2.5
Online class	5	2.5
Access public service websites	13	6.5

Table II.
Experience using library public computing facilities

revealed that 27 per cent of the respondents expressed favourable usage, as they had spent more than one hour on the library computers during an average visit.

Respondents were also asked about the type of applications accessed on library computers. Twenty-nine per cent used it for searching library resources, followed by social networking via Facebook (24 per cent), e-mail (16 per cent) and browsing for entertainment online (10 per cent) (Table II). Moreover, empirical evidence recorded that 21 per cent of respondents read news, performed online shopping, searched for jobs, attended online classes and accessed public service websites when using library computers. Almost half of the respondents accessed computers from their home rather than at the library.

Structural equation modelling

SEM was analysed by following the two-step approach by Anderson and Gerbing (1988), using a measurement model and a structural model. The first was performed to test reliability and validity of the measurement model which was conducted via confirmatory factor analysis (CFA), the latter was used to test the research hypotheses based on the structural model framework.

Measurement model

The measurement model was used to assess and endorse the reliability and validity of the measures via the composite reliability, average variance extracted (AVE) and standardized loadings of the construct measures (Table III).

Reliability analysis

Reliability tests were performed to check the internal consistency of the variable items to represent their respective constructs via the reading of Cronbach's alpha and composite reliability. Hair *et al.* (2010) and Nunnally and Bernstein (1994) quantified 0.70 as the adequate threshold for reliability. In this study, the reading of Cronbach's alpha and composite reliability for all factors fulfilled this requirement, indicating that the factor items had high reliability.

Convergent validity

Convergent validity is related to the degree to which two or more items measure the same concept (Bagozzi and Yi, 1988). Convergent validity of the measurement items was verified following the three procedures by Fornell and Larcker (1981):

(1) the item reliability of each measure;

(2) the composite reliability of each construct; and

(3) the AVE.

Table III shows confirmation of the current data having good convergent validity, as all standardized loadings were satisfactory and statistically significant ($p < 0.001$) which exceeded the respective common acceptance levels of 0.70 suggested by previous research (Hair *et al.*, 2010). This established that the measurement items in the untrimmed measurement model captured the respective factors they were supposed to measure. Moreover, the AVE of latent constructs exceeded the endorsed inception value of 0.50 by Hair *et al.* (2010), implying that more than half of the variances observed in the measurement items were accounted for by their hypothesized factors.

Discriminant validity

Discriminant validity measures whether two factors are statistically distinct, or uncorrelated, and tests by comparing the variances shared between factors (i.e. correlation coefficients) with the square root of AVE for each construct. It is considered adequate discriminant validity when the first is lower than the latter (Fornell and Larcker, 1981). In this study, as shown in Table IV, this requirement was achieved, signifying that each factor was statistically different from the others and more closely related to its own measures.

Pearson correlation was performed to measure the inter-construct correlations (attitude, self-efficacy and subjective norms with library patrons' behavioural intention to use public computing facilities at a library). Correlation coefficients in Table IV indicate that there was no high correlation between constructs of the model, highest $r = 0.632$ was at $p < 0.01$, which indicates multicollinearity is evidently absent in this research (Hair *et al.*, 2010). Based on the coefficient values, results specify that subjective norm has the strongest correlation with library patrons' behavioural intention to use public computing facilities ($r = 0.632, p < 0.01$), followed by self-efficacy ($r = 0.448, p < 0.01$). The weakest significant correlation coefficient was the attitude of library patrons ($r = 0.419, p < 0.01$).

Label	Items	Cronbach's alpha	CFA loadings	Composite reliability[a]	Average variance extracted[b]
Attitude		0.743		0.885	0.607
A1	Using public computers in the library is important		0.858		
A2	Using public computers in the library is worthless		0.712		
A3	Using public computers in the library is enjoyable		0.745		
A4	Using public computers in the library is harmful		0.703		
A5	Using public computers in the library is useful		0.862		
Self-efficacy		0.782		0.845	0.577
SE1	I feel confident in handling most problems using public computers in the library		0.788		
SE2	I have no difficulty using computers in the library		0.712		
SE3	I never ask help from librarians while using computers in the library		0.775		
SE4	I am able to accomplish tasks within the allocated time using public computers in the library		0.762		
Subjective norms		0.881		0.884	0.657
SN1	My family members think I should use public computers in the library		0.710		
SN2	My friends think I should use public computers in the library		0.814		
SN3	Most people who are important to me think that I should use public computers in the library		0.814		
SN4	My neighbours think that I should use public computers in the library		0.893		
Behavioral intention		0.841		0.900	0.601
BI1	I intend to use the library computers again within the next week		0.797		
BI2	I will use the library computers regularly in the future		0.848		
BI3	I plan to use the library computers more in the future than I do now		0.787		
BI4	I will likely use the library computers for checking e-mail		0.788		
BI5	I will likely use the library computers for social networking		0.714		
BI6	I will likely use the library computers for entertainment		0.708		

Notes: [a]Composite reliability = (square of the summation of the factor loadings)/{(square of the summation of the factor loadings) + (square of the summation of the error variances)}; [b]AVE = (summation of the square of the factor loadings)/{(summation of the square of the factor loadings) + (summation of the error variances)}

Table III. Reliability and validity analysis

The scores construct approximates a "normal distribution" or "bell-shaped curve", as the skewness of all the factors ranges from −0.075 to −0.460, below ±2.0, and deduces a negatively skewed distribution (Table IV). The values for kurtosis ranged from −0.142 to 0.717, well below the cut-off of ±10. Both values were lower than the cut-off boundary set by Hair *et al.* (2010). Furthermore, the mean for all constructs ranged from 2.873 to 3.096 on a five-point Likert scale of 1 = "strongly disagree" to 5 = "strongly agree". Subjective norms had the highest mean of 3.096 with an SD of 0.680 and closely followed by self-efficacy (mean = 3.033, SD = 0.648) and behavioural intention (mean = 3.006, SD = 0.683). The lowest mean appears for attitude (mean = 2.873, SD = 0.533). This indicates that, on average, most of the respondents had positive intentions to use public computing facilities at a library.

Table V displays the goodness-of-fit (GFI) indices of the measurement model such as χ^2, degrees of freedom, comparative fit index (CFI), GFI index, normed fit index (NFI) and root mean square of approximation (RMSEA) following the recommendations of Bentler (1990), Byrne (2001) and Hair *et al.* (2010). The fit indices prove that the measurement model delivered a realistically good fit to the data in accordance to the recommended values, with the evidence that the χ^2 of the model was 312.559 with 141

Table IV.
Average variance extracted and estimated correlations among constructs

Factors	Attitude	Self-efficacy	Subjective norms	Behavioural intention
Attitude	*0.779*			
Self-efficacy	0.266**	*0.760*		
Subjective norms	0.420**	0.445**	*0.811*	
Behavioural intention	0.419**	0.448**	0.632**	*0.775*
Mean	2.873	3.033	3.096	3.006
SD	0.533	0.648	0.680	0.683
Skewness	−0.166	−0.460	−0.294	−0.075
Kurtosis	−0.328	−0.142	0.717	0.172

Notes: **Correlation is significant at the 0.01 level; diagonal elements in italic represents the square root of AVE

Table V.
Goodness-of-fit indices for the measurement model

Fit indices	Accepted value	Research model value
Absolute fit measures		
χ^2 (chi-square)		312.559
df (degrees of freedom)		141
Chi-square/df (χ^2/df)	<3	2.217
GFI (goodness-of- fit index)	>0.90	0.961
RMSEA (root mean square error of approximation)	<0.10	0.068
Incremental fit measures		
NFI (normed fit index)	>0.90	0.951
CFI (comparative fit index)	>0.90	0.911
Parsimony fit measures		
PCFI (parsimony comparative of fit index)	>0.50	0.751
PNFI (parsimony normed fit index)	>0.50	0.702

degrees of freedom (χ^2/df = 2.217), and the CFI = 0.911, GFI = 0.961 and NFI = 0.951 were greater than 0.90, while the RMSEA = 0.068 was lower than 0.08.

To summarize, the measurement model demonstrated satisfactory reliability, convergent validity and discriminant validity. As the model shows agreeable fit indices, the path coefficients of the structural model is examined next.

Structural model

In the structural model, the proposed hypotheses of the links between attitude, self-efficacy and subjective norm with behavioural intention to use public computing facilities at a library were tested simultaneously. The structural model was evaluated by applying three criteria: the standardized path coefficients and path significances of each path, as well as variance explained (R^2) of the model.

Hair *et al.* (2010) suggested that the χ^2 value and associated degrees of freedom, beside one absolute index, and one incremental index should be reported. Hence, a similar list of GFI indices was used to evaluate the structural model. The overall fit of the structural model, as demonstrated in Table VI, is pleasing [i.e. the χ^2 of the model was 312.559 with 141 degrees of freedom (χ^2/df = 2.17), the CFI = 0.911, GFI = 0.961 and NFI = 0.951 exceeded 0.90, while the RMSEA = 0.068 was below 0.08], signifying that all of the relevant GFI indices outshined the recommended thresholds. Hence, the GFI for the structural model was more than satisfactory.

Table VII and Figure 3 present the standardized path coefficients, and path significances for each construct, as well as variance explained (R^2) of the model. The standardized beta coefficients (β) of the model specify the power of the relationships

Fit indices	Accepted value	Research model value
Absolute fit measures		
χ^2 (chi-square)		368.532
df (degrees of freedom)		142
Chi-square/df (χ^2/df)	<3	2.595
GFI (goodness-of-fit index)	>0.90	0.966
RMSEA (root mean square error of approximation)	<0.10	0.071
Incremental fit measures		
NFI (normed fit index)	>0.90	0.975
CFI (comparative fit index)	>0.90	0.983
Parsimony fit measures		
PCFI (parsimony comparative of fit index)	>0.50	0.763
PNFI (parsimony normed fit index)	>0.50	0.725

Table VI. Goodness-of-fit indices for the structural model

Causal paths			Estimate	SE	CR	*p*-value	Tolerance	VIF
H1 Attitude	→	Behavioural intention	0.432*	0.047	4.870	0.035	0.815	1.226
H2 Self-efficacy	→	Behavioural intention	0.366*	0.032	3.986	0.024	0.795	1.258
H3 Subjective norms	→	Behavioural intention	0.647*	0.093	7.495	0.041	0.704	1.421

Notes: *$p < 0.05$; $R^2 = 0.568$; SE = standard error; CR = critical ratio; VIF = variance inflation factor

Table VII. Summarized results of hypotheses testing

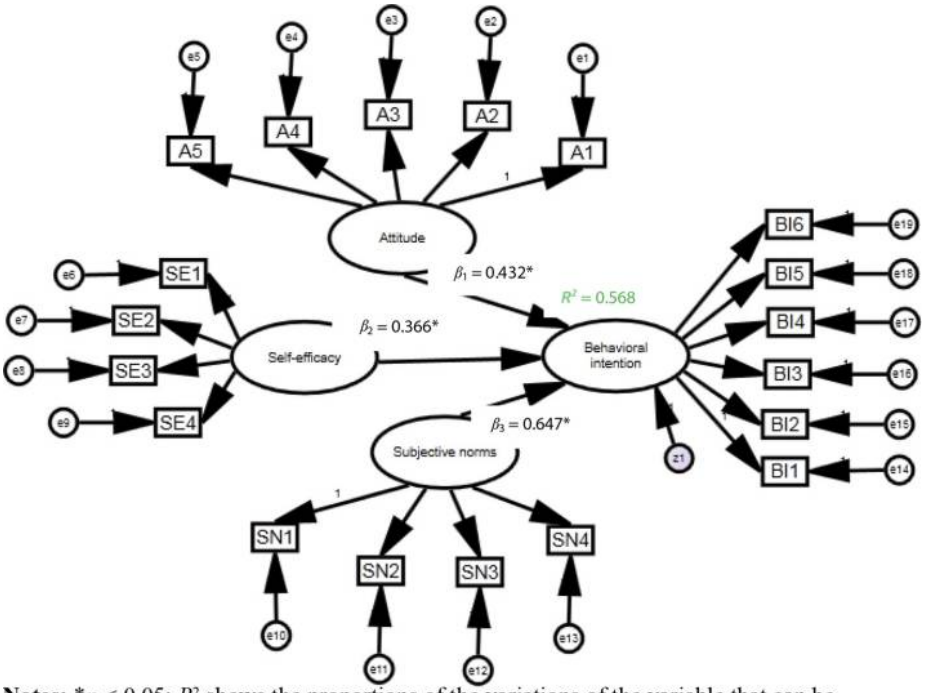


Figure 3.
Hypothesis testing results

Notes: *$p < 0.05$; R^2 shows the proportions of the variations of the variable that can be explained by its causing components

between constructs based on the postulated hypotheses, while R^2 depicts the amount of variance in the endogenous variable explained by the exogenous variables. Empirically, *H1* proposes that attitude positively affects library patrons' behavioural intention to use public computing facilities at a library. SEM results reveal that attitude of the library patrons ($\beta_1 = 0.432$, *t*-value = 4.870, $p < 0.05$) as posited in *H1* significantly impacts their behavioural intention to use public computing facilities at a library. Thus, results provided evidence maintaining *H1*, as estimated.

As Table VII shows, *H2* conjectures that self-efficacy positively affects library patrons' behavioural intention to use public computing facilities at a library. In a similar vein, this analytical study found that self-efficacy of library patrons ($\beta_2 = 0.366$, *t*-value = 3.986, $p < 0.05$) also has a significant relationship with behavioural intention to use public computing facilities, inferring that *H2* is accepted. The final hypothesis, *H3*, put forward that subjective norms positively affect library patrons' behavioural intention to use public computing facilities at a library. A closer examination of the results divulged that a positive, significant effect of library patrons' subjective norms in predicting their behavioural intention to use public computing facilities at a library, implying that *H3* is also sustained, is postulated. Results were $\beta_3 = 0.647$, *t*-value = 7.495, with $p < 0.05$.

All independent variables (attitude, self-efficacy and subjective norms) together accounted for 56.8 per cent of the variance in behavioural intention to use public computing facilities at a library, meaning that the squared multiple correlations ($R^2 = 0.568$), exceeded 0.40 as suggested by Bollen (1989). The variance inflation factor values

for all the independent variables, as presented in Table VII, are beneath 10 (ranging from 1.226 to 1.421), and tolerance values are more than 0.10 (ranging from 0.704 to 0.815), thus ensuring that multicollinearity is equivocal. These values are below the standard limit set by Hair *et al.* (2010).

In sum, the test of the structural model connotes that all standardized beta coefficients are positive and significant, deducing that the study constructs successfully contributed to the enlightenment of library patrons' behavioural intention to use public computing facilities in Malaysia.

Discussion

This study examined the relationships between attitude, self-efficacy and subjective norms with library patrons' behavioural intention to use public computing facilities at a library within Malaysia by using the SEM technique. Before further elaboration on results of the structural model, the goodness of measure was first checked and produced encouraging results when assessing the reliability and validity of the measures covering: convergent validity, discriminant validity, Cronbach's alpha values and composite reliability values.

Empirical results via SEM divulged that the impact of library patrons' attitude on their behavioural intention to use public computing facilities at a library was significant and positive which confirms the formulated *H1*. A positive attitude of the library patrons' decision to use public computing facilities at a library was developed when they clearly noticed and experienced the effectiveness and usefulness of the facilities provided at a library which met their early expectations. This reflected that when they have a positive attitude, they are motivated to use the technology. This result is analogous to that of Ajuwon and Popoola (2015), Chang and Chang (2009), DeMaagd *et al.* (2013) and Suki and Suki (2013).

Library patrons' attitude in using the public computing facilities was further enhanced when the internet connection speed was high, stable and did not fluctuate; thus, providing convenient and faster access for information searches. Descriptively, this study found that the type of applications accessed on library computers were mainly searching library resources, trailed by social networking via Facebook, YouTube and so forth, job searches and access to public service websites. In Chang *et al.* (2009)'s study, attitude played a significant role in determining users' information-seeking intention in an academic digital library. Duffy (2008, p. 125) averred that besides accessing Facebook at public computing facilities at a library:

> […] other SNS applications such as YouTube can be used to create a learning community where everyone has a voice, anyone can contribute, and the value lies equally within the creation of the content and the networks of learners that form around content discovered and shared.

Further examination of SEM results discovered that significant links exist between library patrons' behavioural intention to use public computing facilities at a library and self-efficacy, and in the anticipated direction. Thus, *H2* was secured. Self-efficacy contributes to increasing the library patrons' level of confidence in accessing the internet at a library for information retrieval in accomplishing the tasks assigned by lecturers and professors, as they have no problem in using the library computers within the stipulated library business hours which permits them to receive assistance from the librarians while using it. Library patrons also feel

assertive in controlling all possible technical hitches using computers in the library independently with no hassle. Thus, the higher the degree of self-efficacy of library patrons, the higher the level of inspiration to carry out a task and accomplish the aim (i.e. use public computing facilities at a library), and subsequently, the greater chance to perceive usefulness towards using it.

These substantial findings lend support to earlier work of DeMaagd *et al.* (2013) that patrons had a propensity to use the public access computers at a library more often when they were more confident with their search ability. Din *et al.* (2012), Hong *et al.* (2005) and Ong *et al.* (2004) noted that adult learners' information retrieval for their course work is significantly associated with their academic achievement. This was also further documented by the study of Moos and Azevedo (2009) that a high level of computer or internet self-efficacy has been explained as a focal element leading to preferred learning outcomes via e-learning systems.

Likewise, the results of SEM for *H3* were also significant at $p < 0.05$ and confirmed that library patrons' behavioural intention to use public computing facilities at a library was significantly predicted by subjective norms and, in the expected path, as hypothesized in the TPB. When referring to the standardized beta coefficients calculated for each of the three paths, a remarkable discovery was that the highest beta values appeared for subjective norms, forming the most powerful determinant of consideration by the respondents. One plausible elucidation of the finding is that the higher the extent of influence and motivation from family members, friends and neighbours, the greater is the library patrons' behavioural intention to use public computing facilities at a library among Malaysians. Using public computers in a library helps them to be more independent in completing their assignments and conducting research collaboration, checking e-mail messages, social networking and performing other online tasks.

The study by Chang and Chang (2009) revealed that subjective norms impacted individuals' intention to use library self-service. Ali and Fulton (2015) also found that subjective norms influenced the use of SNS tools on scholarly communication. Chang *et al.* (2009)'s study corroborates the finding that subjective norms were found to be an important factor in envisaging users' information-seeking intention in an academic digital library. This was further documented by the study of Gruzd *et al.* (2012), whereby the usage of social media in research practices by the faculty members is affected by subjective norms. The finding is further coherent with several empirical discoveries (Gu and Widén-Wulff, 2011; Rowlands *et al.*, 2011; Suki and Suki, 2013). Students can exchange information and gain knowledge from other friends at the library (DeMaagd *et al.*, 2013).

Conclusion and recommendations

The results convey enthralling and imperative implications in terms of theoretical implications, methodological implications and practical implications within the context of Malaysian libraries. With regard to theoretical implications, the discoveries of this study bring noteworthy significance to the growing literature around the TPB model but emphasize library patrons' behavioural intention to use public computing facilities at a library. The outcomes of this study add new momentum to the earlier discoveries on library patrons' intention to use public

computing facilities at a library, which has been inadequately researched in Malaysian settings.

The key theoretical contribution comprises the insertion of the self-efficacy dimension, in place of perceived behavioural control, in a single model for the advancement of knowledge yields a greater understanding of the important factors that affect library patrons' behavioural intention to use public computing facilities at a library. Further, this research provided empirical evidence for the verification of the theoretical model and paradigms outside the USA, and particularly offered deeper and richer understanding of library patrons' behaviour related to experience and perception in using public computing facilities at a library in Malaysia.

With reference to methodological contributions, by adapting measurement instruments from preceding research to suit the usage of public computers in the library context, the research confirms the reliability and validity of the instruments in a developing country such as Malaysia. For instance, by using CFA via a SEM approach, the assessment of convergent validity, discriminant validity, Cronbach's alpha values and composite reliability values of the measurement model have been thoroughly checked together with the goodness-of-fit measures before reporting the standardized beta coefficients of the structural model.

This study adopts SEM as a comprehensive approach to explain structural relationships of attitude, self-efficacy and subjective norms with library patrons' behavioural intention to use public computing facilities at a library. The modelling follows a standard approach and uses previously developed measurement instruments adapted to the current settings. Based on the quantitative research design using the SEM technique, this study furnished useful empirical insight and methodical understanding of the central empirical factors that have substantial impact on library patrons' behavioural intention to use public computing facilities at a library. This research found that besides the subjective norm factor (i.e. influence from family members, friends and neighbours), additional vital factors (i.e. attitude and self-efficacy) which were extracted from the theoretical model jointly had significant causal relationships with library patrons' behavioural intention to use public computing facilities at a library in Malaysia.

Pertaining to managerial implications, of the exogenous variables examined, library patrons' behavioural intention predominantly predicted by the subjective norm factor, inferring that university librarians and library administrators need to carefully consider social feedback of family members, friends and neighbours to improve library patrons' behavioural intention to actively use public computing facilities at a library for quality information retrieval. Van Dierendonck *et al.* (2007) asserted that feedback from multiple sources was essential to gain better performance in information searches. Additionally, service should be offered in a friendly and courteous manner, with library staff being well-versed in their duties and more responsive to queries, rendering services promptly.

Next, to strengthen library patron's attitude in using public computing facilities at a library, it is imperative for university librarians and library administrators to emphasize attentiveness to library patrons' attitude, frequency of usage and computer competence. As pointed out by Bechwati and Xia (2003), people have positive attitudes with positive emotions, such as happiness or pride, when the search process is successful. Administrators and librarians must stay abreast of

library patrons' attitudes in terms of their capabilities with regard to information seeking skills at a library. Library patrons would have an enjoyable experience searching for and retrieving information by being physically present at a library with all books and materials stored on shelves in the correct order. Providing instruction to library patrons would encourage more usage of online information resources in retrieving relevant and more up-to-date research information. These information literacy skills programs ease students' technical complications in library environments while accessing information (Erfanmanesh *et al.*, 2014; Liyana and Noorhidawati, 2014).

To provide library patrons with greater self-efficacy, self-reliance and a higher quality of experience with library services, university librarians and library administrators should provide sufficient numbers of computers for data research in the library leading to an upsurge in their self-efficacy concerning the use of reliable information sources. High self-efficacy significantly affects varieties of information tasks (Bronstein and Tzivian, 2013; Nahl, 2005). Additionally, there should be easy access to information retrieval through wireless networks and an internet connection running smoothly without congestion in the library. Liyana and Noorhidawati (2014) indicated that demand for computer usage at a library varies among library patrons as Master's students prefer to use internet search engines to find information, while PhD students use online databases to seek information.

When the aforementioned pivotal strategies are taken care of by university librarians and library administrators, it should boost library patrons' intention to use the library computers regularly and could affect their achievement of successful information retrieval and performance accomplishments.

Future research directions

As an extension of this study, it is necessary for forthcoming research to broaden the sample coverage and examine diverse geographical locations for better and more representative data analysis, as the sample was constrained to 200 undergraduates in a single university which cannot typify all universities in Malaysia. Next, it would be interesting for future research to consider expanding the research study to other university libraries in the country to make a comparative study. They may consider using multi-groups for moderating analysis via the AMOS program for quantitative validation testing by dividing samples into two groups, such as male and female or experienced users against inexperienced users. This would improve the generalizability of the research findings beyond the limited sample coverage.

Furthermore, the R^2 for this study was 0.568, suggesting that, besides the current constructs, more research work is recommended to incorporate other essential factors that affect library patrons' behavioural intention to use public computing facilities at a library, such as demographic characteristics, culture, computer skills and ICT experience. Students with adequate computer skills would consider the use of the public computing facilities at a library to be easy. In future research, it would be constructive to consider incorporating mediating variables, such as perceived risks in the research model, to improve the explained variance.

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