Received 18 February 2015
Revised 28 May 2015
Accepted 25 July 2015

Understanding users' continuance intention to use online library resources based on an extended expectation-confirmation model

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Abstract

Purpose – This study aims to investigate the factors affecting students' continuance intention to use online library resources (OLRs) in the context of academic libraries. Based on an extended expectation confirmation theory (ECT), the effects of usefulness, confirmation and resource quality on continuance intention to use OLRs were examined.

Design/methodology/approach – To empirically test the model, a survey study was conducted. Data were collected from 606 student library users at a large state university in the USA. The collected data were analysed quantitatively to answer seven hypotheses using partial least squares method.

Findings – The findings revealed that both usefulness and confirmation had a positive direct and indirect influence on continuance intention. Also, the effect of resource quality on continuance intention was found to be significant. Satisfaction had a mediating effect on the relationship between usefulness, confirmation and resource quality, and continuance intention.

Originality/value – This study is one of the first attempts that adopted the ECT to understand students' continuance intention to use OLRs. In addition, the effect of the multiple dimensions of resource quality – accessibility, credibility, coverage, and format – on users' continuance intention to use OLRs was investigated.

Keywords User studies, Academic libraries, User satisfaction, Library science, Information seeking behaviours

Paper type Research paper

1. Introduction

Because many library materials are now provided online, students have begun to use online resources more frequently than traditional printed materials (Lee *et al.*, 2012). Academic library resources in digital format are perceived as easy to access because they are available remotely and easily browsable through the search engine (Thong *et al.*, 2002). For this reason, it has become essential to understand students' behavioural intention with regards to online resources in academic library environments, in particular, the factors related to their intention to consistently utilize online library resources (OLRs).

The Electronic Library
Vol. 34 No. 4, 2016
pp. 554-571

0264-0473
DOI 10.1108/EL-02-2015-0033

In this study, OLRs are defined as:

> […] library information resources that are serviced in the digital format accessible remotely through the web, such as e-books, electronic journal articles, online magazines, dissertations and theses, course reserves, and digital archives.

(Booker *et al.*, 2012; Xie, 2008). With the growth of digitized and born-digital resources, academic libraries need to focus more on online digital resources when encouraging students to utilize their collections, especially, because today's students are comfortable with internet access and information in digital format. This study aims to investigate how usefulness, confirmation, resource quality, and satisfaction levels influence users' intention to continue using OLRs.

This study focuses on students' post-adoption behaviour based on the expectation–confirmation model (Bhattacherjee, 2001), which was designed to explain users' continuance intention after their initial adoption and use of a particular information system. OLRs currently compete with easy-to-access internet materials. In particular, millennial students prefer using web search engines to libraries because of their convenience and speed, although they consider OLRs to be accurate and credible (Holman, 2011). Therefore, it is important to encourage students to use reliable OLRs by understanding relevant factors influencing students' continued use intention. In addition, the relationship between resource quality and continuance intention is further investigated and is one of the unique contributions of this study. Based on the findings, practical suggestions are provided with the aim to promote continued OLR use among students.

2. Literature review

2.1 Factors affecting online resource usage

Multiple factors have been identified in relation to online information resource usage in previous literature. Researchers have found that accessibility, availability, ease of use and convenience are common factors associated with online resource usage. For example, Pascoe *et al.* (1996) suggested that ease of use, convenience and accessibility were significant factors related to web information use in academic fields. Burton and Chadwick (2000) also found that users placed a high value on accessibility, ease of use and availability when choosing information sources but were less concerned about publisher reputation. Fidel and Green (2004) emphasized the significance of accessibility in information seeking and use and examined different aspects of accessibility that assist users in accessing information online, such as familiarity, suitable format and type of information. Liu and Yang (2004) identified the factors that would cause resource selection in the context of distance education: their results showed that timeliness, ease of access and ease of use were considered important by distance education graduate students.

Usefulness is another decisive factor affecting resource selection. Matusiak (2012) claimed that usefulness is one of the key factors related to digital library resource uses. Her research findings revealed that user-perceived usefulness had a significant influence on user intention to consistently use digital library resources. Thong *et al.* (2002) applied the technology acceptance model (TAM) to examine the effects of usefulness and ease of use on digital library system usage. They verified that both usefulness and ease of use were significant determinants of user acceptance of digital

libraries. Similarly, Jeong (2011) analysed how usefulness and ease of use would affect users' behavioural change in accepting library systems based on TAM. He found that both perceived usefulness and ease of use are key determinants of electronic library system use. Similarly, Booker *et al.* (2012) used the TAM to examine business students' use of online resources in academic libraries. Their results indicated that perceived usefulness has a positive impact on behavioural intention to use library resources, whereas perceived ease of use had no direct effect. Recently, Aharony (2014) used the TAM to predict the likelihood of e-book adoption by examining the effects of usefulness and ease of use. Using structured equation modelling, she confirmed that usefulness, ease of use, personal innovativeness and other personal characteristics are significant predictors of e-book use.

Some researchers in the discipline of library and information science have directly surveyed user perception of factors related to information resource use. Quigley *et al.* (2002) conducted a user survey of 230 researchers at a state university to determine the importance of six factors, including speed, convenience, familiarity, currency, authoritativeness and reliable availability. Their results revealed that convenience was considered the most important factor in resource use. Xie and Joo (2009) qualitatively identified 17 factors of web source selection in their exploratory study of 31 web search episodes. Those factors include accessibility, ease of use, interactivity, useful results, task type and others. Lee *et al.* (2012) comprehensively explored four dimensions of factors associated with information use in academic tasks. Interestingly, they looked into what ways search strategies and interactions are associated with users' resource use behaviour.

Previous studies have also investigated how resource use behaviour differs by work tasks. Scientists tended to use accurate, reliable and credible resources for their research tasks. Lee *et al.* (2008) found that accuracy, currency and reliability were considered the most important factors by researchers when conducting scientific research projects. Vibert *et al.* (2007) investigated the task effect on scientists' selection of online resources, finding that the time constraints of the task had a crucial impact on scientists' selection of online resources and that scientists preferred sources that were efficiently accessible, comprehensive and reliable.

Resource quality has been known to be an important factor affecting resource usage intention (Lee *et al.*, 2009). A variety of criteria have been suggested in judging the quality of information resources. Resource quality itself is a multi-dimensional concept, and many extant studies introduced a number of indicative variables, among them reliability, credibility, currency, completeness, sufficiency, comparability, timeliness and coverage (Bailey and Pearson, 1983; Bharati and Chaudhury, 2006; Miller, 1996; Strong *et al.*, 1997). Particularly, resource quality has been a critical concern in understanding the acceptance of information systems. For example, the information system success model suggested by DeLone and McLean (1992) viewed information quality, which is an equivalent concept with resource quality, as one of the key determinants that influences the use intention of an information system. In addition, in web-based system uses, resource quality acts as a key factor in the adoption of information systems (Calisir *et al.*, 2014; Xu *et al.*, 2013).

2.2 Expectation confirmation theory

Over the past several decades, identifying what affects continued information systems use has been one of the most active research topics in the information system use literature. Constructs, such as expectation, confirmation and satisfaction (Bhattacherjee,

2001), perceived usefulness and ease of use (Karahanna *et al.*, 1999) and habit (Limayem *et al.*, 2007) have all been examined to better predict users' continued information system use in various contexts. As a result, our understanding of what leads to long-term use of an information system beyond its initial adoption has been considerably enhanced (Jasperson *et al.*, 2005).

Bhattacherjee (2001) introduced a theoretical model to examine information system continuance by drawing on the expectation confirmation theory (ECT) (Oliver, 1980). The theory highlights the impact of a user's expectation and subsequent confirmation of using an information system on their satisfaction and perceived usefulness, which ultimately influence information system continuance intention. Because of its parsimony and strong explaining power, the model has been adopted and expanded in numerous studies (Hong *et al.*, 2006; McKinney *et al.*, 2002; Susarla *et al.*, 2003). Lin *et al.* (2005) integrated perceived playfulness into the model (Bhattacherjee, 2001) and showed that it also contributed significantly to the users' intention to continue using their web portal site. Similarly, Limayem and Cheung (2008) added habit as a moderating variable to Bhattacherjee's model and found that the strength of intention to predict continuance is weakened by a high level of information system habit in the e-learning context.

Despite the benefits of the ECT as a research model, it has not been widely adopted in the library system context yet. Recently, Cheng (2014) applied the ECT to investigate users' continuance intention of using a national-level digital library system and demonstrated that the ECT can be a convincing model to be used in library system research. In the context of learning systems, Lin and Wang (2012) adopted the ECT as a research model to investigate the continuance intention of e-learning systems. However, few studies have attempted to use the ECT in the context of OLRs at the academic library level.

Previous research has greatly contributed to the understanding of factors affecting why users select and continue to use information sources. Researchers identified a variety of factors that could lead users to select information sources, such as accessibility, convenience, effectiveness and usability. In addition, resource quality has been considered an important determinant in users' resource selection behaviour. Prior literature claimed that resource quality is critical, especially when users determine what resources to use in formal tasks, particularly academic tasks (Biddix *et al.*, 2011; Lee *et al.*, 2012; Xie and Joo, 2009). However, there has been little research that investigated usefulness, confirmation, satisfaction and resource quality simultaneously in the context of OLRs. More importantly, to the best of our knowledge, the ECT has not been used to explain users' continuance intention in relation to OLRs.

3. Research model and hypotheses

This study adopted the ECT to investigate the continuance use intention in the context of OLRs. In addition, resource quality has been added to the research model. Resource quality has been studied with regard to information source selection in different situations as reviewed in the literature review section; students consider resource quality important when they conduct academic tasks, such as class assignments and research projects. In our model, resource quality is measured by four subordinate constructs – accessibility, credibility, coverage and format. Lee *et al.* (2012) identified those subordinate constructs, among others, as key dimensions of resource quality. The overall research model involves the direct and indirect effects of usefulness,

confirmation and resource quality on continuance intention. In addition, the status of students (i.e. undergraduate or graduate) is included in the model as a control variable. The assumption is that the different learning needs of two groups, undergraduates and graduate students, would influence their post adoption behaviour (Catalano, 2013).

Seven specific hypotheses were established and empirically tested based on a survey of OLR users (Figure 1). Based on the ECT, the researchers assumed that usefulness and confirmation would influence continuance intention, whereas satisfaction mediates between those factors. Additionally, they assumed that resource quality would have an impact on both satisfaction and continuance intention.

3.1 Perceived usefulness

Perceived usefulness refers to the degree to which a user perceives that using OLRs would enhance his/her job performance (Park *et al.*, 2009). Usefulness has been identified as one of the major predictors in information system use in TAM-based studies. According to the TAM, perceived usefulness is a critical factor that accounts for user attitude toward and use intention of information systems (Davis, 1989). This study also hypothesizes the positive causal relationship between perceived usefulness and continuance intention (*H1*).

In addition, an information system's usefulness can influence users' feeling or affective status after they have completed their tasks with it, which can be measured as satisfaction level (Bhattacherjee, 2001). The more useful users perceive an information system to be, the more satisfied they are with it. Previous studies have found a high correlation between perceived usefulness and satisfaction in terms of library system use (Joo, 2010). This study attempts to examine the potential effect of perceived usefulness on user satisfaction level based on the ECT (*H2*):

H1. Perceived usefulness will have a positive impact on continuance intention.

H2. Perceived usefulness will have a positive impact on satisfaction.

3.2 Confirmation

In this study, confirmation refers to the users' perception of the expected benefits of OLR use and its actual performance (Bhattacherjee, 2001). Bhattacherjee (2001) claimed that confirmation positively affects perceived satisfaction because it implies the realization of the expected benefits of information system use. Subsequent studies validated the

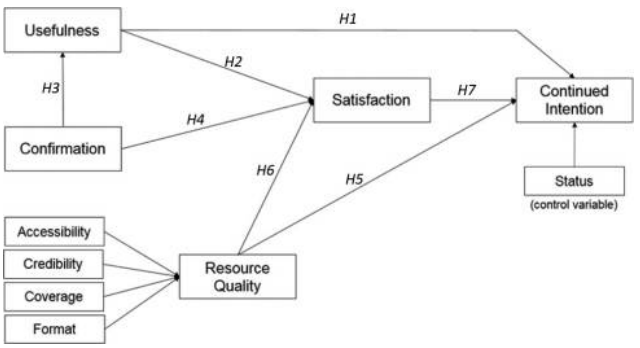

Figure 1.
Research model (extended from the expectation confirmation theory)

effects of confirmation on perceived usefulness and satisfaction in various information system contexts, such as e-learning (Lin and Wang, 2012) and at a national-level digital library in Taiwan (Cheng, 2014). On the basis of the ECT, this study examines the effect of confirmation on users' continuance intention to use OLRs and proposes the following two hypotheses:

H3. Confirmation will have a positive impact on perceived usefulness.

H4. Confirmation will have a positive impact on satisfaction.

3.3 Resource quality

Resource quality refers to the quality of content provided through an academic library. In this study, four dimensions were identified as the key elements of resource quality in the context of OLRs: accessibility, credibility, coverage and format. Many researchers identified resource quality as a critical factor in understanding users' behavioural intention towards information system use (Calisir *et al.*, 2014; DeLone and McLean, 1992; Lee *et al.*, 2009; Xu *et al.*, 2013). This study also posits that resource quality is one of the motivators of continued OLR usage in academic libraries. In addition, it is assumed that resource quality positively influences user satisfaction. Several prior studies proved that resource quality is positively associated with user satisfaction level in various online information contexts (Chae *et al.*, 2002; Chiu *et al.*, 2007; Zheng *et al.*, 2013). Based on these prior discussions, this study proposes the following two hypotheses:

H5. Resource quality will have a positive impact on continuance intention.

H6. Resource quality will have a positive impact on satisfaction.

3.4 Satisfaction

In this study, satisfaction refers to a user's favourable feelings towards his or her usage of OLRs (Seddon, 1997). The ECT posits user satisfaction, which can be formed from prior use experience, is a primary factor that has a causal effect on the intention to consistently use a certain information system (Bhattacherjee, 2001). Limayem and Cheung (2008) also stressed that satisfaction has a strong impact on continuance intention with regards to information system usage. This study hypothesizes that a user with a high satisfaction level with OLRs is more likely to continue using them:

H7. Satisfaction will have a positive impact on continuance intention.

4. Method

4.1 Data collection and analysis

A survey was administered to collect data from students enrolled in a large research state university in the USA. An e-mail invitation was sent to 9,990 students randomly selected from the e-mail list of undergraduate and graduate students, which was obtained from the university's registrar office. Through e-mail invitation, the researchers solicited their participation in an online survey and 606 valid responses were obtained. The survey was conducted between 15 September and 6 October in 2014 for approximately three weeks. The survey questionnaires consisted of:

- demographic information;
- OLR use frequency;

- perceptions of usefulness, confirmation, resource quality and satisfaction related to OLRs; and
- continuance intention of OLRs.

The study considered only subjects who had prior experience of OLR use because the intention was to measure their experience with and continuance intention to use OLRs. A seven-point Likert scale was used to measure user-perceived usefulness, confirmation, resource quality, satisfaction and continuance intention.

4.2 Measures and data analysis

The measurement instrument was designed by adopting and modifying previously validated items. To ensure content validity, two faculty members at the authors' university, who have extensive experience in survey measurement, were consulted to examine the wording and content of the questions, as well as the overall design and process of the online survey. Some of the wording and certain survey processes were changed based on their feedback. Five students were then asked to pre-test the online survey before its release. From the pre-test, some minor wording was modified. Items for the latent constructs were measured on a seven-point Likert scale. Structural analysis was conducted upon the collected data. The partial least squares (PLS) analysis was used for testing the suggested structural model and validating the measurement in terms of both reliability and validity. The PLS was selected because the research model requested the analysis of the repeated indicators approach for the measures of resource quality, which consist of first-order (i.e. reflective-formative) factors (Wetzels *et al.*, 2009). Because the construct of resource quality is both endogenous and formative, the latent variable scores of all top-level constructs were used to test the model (Lowry and Gaskin, 2014). SmartPLS 2.0 was used for the PLS analysis (Ringle *et al.*, 2005).

5. Results

This section reports on the results of this study. Table I presents the demographic information of the participants.

To measure the constructs proposed in Figure 1, the authors developed the measurement instrument. The measurement instrument is presented in Appendix. To ensure the measurement of the study, construct reliability, internal consistency, convergent validity and discriminant validity sequentially were assessed.

First, construct reliability was checked by calculating composite reliability scores. The obtained composite reliability scores of all constructs were above 0.70, which satisfied the recommended threshold (Fornell and Larcker, 1981).

Second, a Cronbach's alpha test was carried out to assess the internal consistency amongst the measurement items. The results showed that α values were all higher than 0.70, indicating their adequacy (Fornell and Larcker, 1981) (Table II).

Third, as a means of examining convergent validity, factor loadings and average variance extracted (AVE) were evaluated. All factor loadings were well over 0.70, evidence of the instrument's convergent validity (Comrey, 1973). As shown in Table II, the observed AVE values for the constructs were ranged between 0.786 and 0.893, which indicates that the variance extracted from each construct exceeds that of coming from measurement error (Fornell and Larcker, 1981). Discriminant validity was evaluated by examining cross-loadings and the square roots of the AVE. As shown in Table III, the

Item	Category	Frequency	(%)
Gender	Male	226	37.3
	Female	380	62.7
Age	18-22	359	59.2
	23-27	137	22.6
	28-34	62	10.2
	35 or older	38	6.3
	No response	10	1.7
Status	Freshman	122	20.1
	Sophomore	73	12.0
	Junior	83	13.7
	Senior	107	17.7
	Graduate student	221	36.5
Use frequency	Daily	41	6.8
	2-3 times a week	91	15.0
	Once a week	81	13.4
	2-3 times a month	137	22.6
	Once a month	93	15.3
	Less than once a month	163	26.9
Familiarity with online library resources	Extremely familiar	35	5.8
	Very familiar	124	20.5
	Moderately familiar	273	45.0
	Slightly familiar	154	25.4
	Not familiar	20	3.3

Table I. Sample characteristics

Construct	Mean	SD	Cronbach's alpha	Composite reliability	AVE
Confirmation	5.203	1.233	0.8647	0.9168	0.786
Continuance intention	5.780	1.268	0.9132	0.9454	0.852
Accessibility	5.566	1.240	0.8758	0.9236	0.801
Credibility	6.146	0.875	0.9597	0.9707	0.892
Coverage	5.741	1.097	0.869	0.9197	0.792
Format	5.280	1.298	0.9402	0.9617	0.893
Usefulness	5.592	1.313	0.9456	0.9608	0.859
Satisfaction	5.255	1.186	0.9332	0.9523	0.833

Table II. Construct reliability and convergent validity

square roots of the AVE were larger than the inter-construct correlations, which indicate an adequate level of discriminant validity (Fornell and Larcker, 1981).

Figure 2 reveals the PLS analysis results of testing the research model. All path coefficients were statistically significant at the alpha level of 0.05. In particular, three exogenous latent variables – usefulness, satisfaction and resource quality – positively affected users' continuance intention, accounting for 55.5 per cent of the total variance together. The effect of usefulness ($\beta = 0.431$) was relatively higher than that of satisfaction ($\beta = 0.213$) or resource quality ($\beta = 0.166$), and confirmation was found to have an indirect effect on continuance intention through usefulness and satisfaction. This result indicates that the ECT model also has a strong explanatory power in predicting users' continuance intention in the context of OLRs.

Table III.
Discriminant validity

Constructs	Confirmation	Continuance intention	Accessibility	Credibility	Coverage	Format	Usefulness	Satisfaction
Confirmation	**0.887**	0	0	0	0	0	0	0
Continuance intention	0.549	**0.923**	0	0	0	0	0	0
Accessibility	0.538	0.507	**0.895**	0	0	0	0	0
Credibility	0.379	0.436	0.474	**0.945**	0	0	0	0
Coverage	0.526	0.461	0.550	0.499	**0.890**	0	0	0
Format	0.580	0.464	0.606	0.409	0.564	**0.945**	0	0
Usefulness	0.448	0.682	0.522	0.468	0.448	0.441	**0.927**	0
Satisfaction	0.625	0.579	0.643	0.410	0.558	0.607	0.533	**0.913**

Note: Diagonal elements are the square roots of the AVE

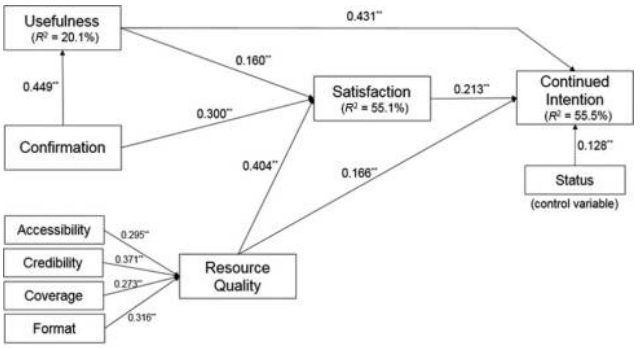

Figure 2.
PLS analysis results

Satisfaction was explained by three exogenous constructs – usefulness ($\beta = 0.160$), confirmation ($\beta = 0.300$) and resource quality ($\beta = 0.404$) – accounting for 55.1 per cent of the total variance together. Interestingly, resource quality was closely related to satisfaction. Overall, the resulting model well explains users' continuance intention involving the direct effects of usefulness, satisfaction and resource quality, as well as the indirect effect of confirmation.

The control variable of status turned out to be significant, $\beta = 0.128$ ($p < 0.01$). It reveals graduate students were more likely to use OLRs continually than undergraduate students. This finding reaffirms previous studies that graduate students tend to seek reliable resources provided by libraries (Catalano, 2013; Junni, 2006).

6. Discussion

The study confirmed that multiple factors influence students' intention to continue using OLRs. The findings of this study can be useful to better understand the underlying factors of users' continued usage of OLRs. In addition, this study yields practical implications as to how to promote consistent use of OLRs to students, as well as implies a new approach to assess OLRs based on the ECT.

6.1 Implications for research

This study is one of the first to adopt the ECT in the context of OLRs in academic libraries. Cheng (2014) applied the ECT to understand user behavioural intention in using a national-level digital library system, but his research focused more on the system side rather than the resources. Less research has been conducted that adopts the ECT as a way to understand students' intention to continue using OLRs at the academic library level. The ECT has been validated to be an effective research framework to understand the reasons why users revisit a certain information system (Cheng, 2014; Hong *et al.*, 2006; McKinney *et al.*, 2002). Because online resource services in academic libraries can be regarded as an information system, the ECT can serve as a compelling research framework to understand users' behavioural intention as to whether they are willing to continue to use OLRs after their initial use.

Additionally, the authors extended the ECT by including the construct of resource quality and confirmed that resource quality is positively associated with users'

perceived satisfaction and continuance intention. In this study, the resource quality construct was measured using four subordinate constructs (i.e. accessibility, credibility, coverage and format) by using a second-order structural model. Prior studies identified multiple aspects of online resource quality (DeLone and McLean, 2004; Rieh, 2002; Stvilia *et al.*, 2009), but only a few of them empirically tested the effect of those aspects quantitatively and comprehensively in the context of OLRs.

6.2 Implications for practice

Perceived confirmation and usefulness were the most significant determinants explaining users' intention to continue using OLRs. The effect of confirmation on continuance intention was indirect, mediated by satisfaction; usefulness turned out to be more influential to users' continuance intention. To increase the perceived usefulness of OLRs in the eyes of students, academic libraries should provide instruction that emphasizes how OLRs can be used to solve information needs arising from academic tasks. In particular, course-embedded library instruction can have a positive influence on users' perception of library source usefulness (Kim and Sin, 2011). Perceived confirmation indirectly influenced users' continuance intention through the mediating effects of usefulness and satisfaction. To help users confirm their expectations, academic libraries need to better understand what they expect of OLRs by conducting regular needs assessment and evaluating how the library's online resources are currently meeting those expectations.

This study also found that the four dimensions of resource quality (i.e. accessibility, credibility, coverage and format) are significant determinants of continuance intention to use OLRs. Many previous studies claimed that users tend to prioritize resource accessibility when determining how to proceed with their research (Colón-Aguirre and Fleming-May, 2012; Connaway *et al.*, 2011). Thus, academic libraries need to make their OLRs easily accessible to encourage student use. Credibility is another important element of resource quality that leads users to continue using OLRs. University-level information literacy education or library instruction can instil in students the importance of using credible resources, as well as teach them how to find credible sources among the library's online resources. The results also show that resource coverage and format significantly affect continuance intention. As a means to improve resource quality, libraries should conduct user needs assessment when developing their online collections and attempt to provide a wide scope of online resources. The format of these resources (i.e. file format, content layout, etc.) should be user friendly. Academic libraries can conduct user experience analysis to identify what type of format users prefer when using OLRs.

Moreover, this study also yields insight into ways to improve the evaluation of OLRs. Researchers have suggested a variety of criteria to assess different aspects of digital libraries, including online resource services in academic libraries (Jeng, 2005; Joo and Lee, 2011; Xie, 2006). For example, the DigiQUAL project developed a service quality evaluation model and identified a range of comprehensive evaluation criteria (Kyrillidou and Giersch, 2005). Those evaluation criteria were useful in assessing different dimensions of electronic libraries, ranging from usefulness, ease of use, learnability, satisfaction, interface and others. However, the ECT has not been introduced in evaluation practices of academic library resources. The ECT can serve as the evaluation framework to assess users' satisfaction and its effect on continuance use by measuring

usefulness and confirmation levels from users' perspectives, as well as their perception of the quality of OLRs that a library offers in terms of accessibility, credibility, coverage and format. All the constructs suggested in this study have been empirically tested for their reliability and validity as measurement instruments, so the research model would be an accurate way in terms of measurement to evaluate OLRs in an academic library environment.

7. Conclusion

Based on an extended ECT, the researchers investigated four factors – usefulness, confirmation, satisfaction and resource quality – that affect users' continuance intention to use OLRs. The findings of this study revealed that usefulness is the most significant determinant on continuance intention to use OLRs in academic libraries, and that confirmation has a positive impact on continuance intention indirectly through the mediating effects of satisfaction and usefulness. In addition, the effect of resource quality on satisfaction and continuance intention was examined, which both turned out to be significant statistically.

The study has some limitations that should be acknowledged. The study purely relied on quantitative analysis based on inferential statistics. Even though the researchers empirically tested a research model that was developed based on the ECT, no specific examples as to how the ECT factors and resource quality would influence users' behaviour were provided. In addition, the sample consists of only students, excluding faculty, researchers, staff and lecturers, who are also significant user groups of OLRs. These limitations indicate a need for future research that includes a qualitative approach to supplement the quantitative findings of this study. Additionally, the sample needs to be enlarged to include other possible user groups of OLRs.

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Appendix. Research constructs and measures

Latent construct	Item code	Measurement item	References
Usefulness	*use1*	Using online library resources improves my performance in completing my academic tasks	Park *et al.*, 2009
	use2	Using online library resources increases my productivity in completing my academic tasks	
	use3	Using online library resources enhances my effectiveness in completing my academic tasks	
	use4	Overall, online library resources are useful in completing my academic tasks	
Accessibility	*acc1*	Online library resources what I am searching are accessible through the library web site	Lee *et al.*, 2009; Lee *et al.*, 2012
	acc2	Online library resources allow information to be readily available to me	
	acc3	I can access online library resources whenever I need to find them	
Credibility	*cre1*	I can trust the information from online library resources	Lee *et al.*, 2009
	cre2	The information obtained from online library resources is accurate	
	cre3	The information obtained from online library resources is reliable	
	cre4	Online library resources are trustworthy	
Coverage	*cvr1*	Online library resources cover a wide variety of topics	Lee *et al.*, 2009; Lee *et al.*, 2012
	cvr2	Online library resources provide a sufficient amount of information in the topics I am interested in	
	cvr3	Online library resources cover a wide range of time period of information	
Format	*for1*	The information provided by online library resources is well formatted	Wixom and Todd, 2005
	for2	The information provided by online library resources is well laid out	
	for3	The information provided by online library resources is clearly presented on the screen or in a printable format	
Confirmation	*cfm1*	My experience with using online library resources was better than what I expected	Cheng, 2014
	cfm2	The information quality provided by online library resources was better than what I expected	
	cfm3	Overall, most of my expectations from using online library resources were confirmed	
Satisfaction	*sat1*	Very dissatisfied - - - - - - - - - - Absolutely satisfied	Lee *et al.*, 2009; Thong *et al.*, 2006
	sat2	Very displeased - - - - - - - - - - Very pleased	
	sat3	Very frustrated - - - - - - - - - - Very contented	
	sat4	Very terrible - - - - - - - - - - Absolutely delighted	
Continuance intention	*int1*	I intend to continue using online library resources rather than discontinue its use	Hu *et al.*, 2009
	int2	My intentions are to continue using online library resources rather than any alternative means	
	int3	I would like to continue using online library resources	

Table AI.
Latent constructs and corresponding measurement items

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