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Factors influencing academic library users' intention to use mobile systems: A comparison of current users and potential adopters

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Abstract

Purpose: The study intends to examine the factors influencing the behavioral intention to use academic libraries' mobile systems from the perspective of current users and potential adopters, respectively.

Design/methodology/approach: Our study investigates the mobile library system's acceptance by using a context-specific extension of the theory of reasoned action (TRA) and the technology acceptance model (TAM), which includes such factors as mobile self-efficacy, personal innovativeness and perceived playfulness. Structural equation modeling was used to test the validity of the proposed model based on the empirical data which was collected from 210 questionnaire survey participants.

Findings: The result shows that 1) for both current users and potential adopters, attitude toward use and subjective norm both have a significant and positive impact on behavioral intention to use; 2) perceived usefulness and perceived ease of use are significantly correlated to potential adopters' attitude toward use whereas perceived usefulness and perceived playfulness are significantly related to current users' attitude toward use; 3) as for the comparison between the two groups of users, personal innovativeness not only affects perceived usefulness of both current users and potential adopters, but also affects potential adopters' perceived playfulness positively. Mobile self-efficacy has a significant effect on perceived ease of use for both types of users.

Research limitations: Although the sample size met the basic statistics requirements for the social research, the participants were mainly college students, and other mobile system users like faculty members and researchers were not investigated. In addition, some influencing factors, such as information quality, system quality and service quality were not considered in the research model.

Practical implications: This study reveals main factors which influence both current users and potential adopters' intention to use the mobile system, providing academic libraries with

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insights into management strategies to offer customized mobile services to different types of users.

Originality/value: Previous studies did not distinguish current users from potential adopters, which is not conducive for academic libraries to provide customized services and attract potential users. We presented an exploratory study to address this issue.

Keywords   Mobile library system; Current user; Potential adopter; Behavioral intention to use; Structured equation modeling (SEM)

1   Introduction

With the development of mobile communications technologies, searching for information on the Internet via mobile devices has become increasingly popular. To meet the emerging needs of their mobile users, plenty of libraries have launched mobile services. Mobile library services can be defined as a variety of library services, such as text messaging reference services and notifications and mobile-friendly online catalogs, delivered through the mobile library system based on wireless mobile communications technologies and accessible for every potential user via mobile devices like mobile phones and personal digital assistants (PDAs)[1]. Compared with the previous electronic information services which are based on the desktop computer and wired network, mobile systems enable library users to access their needed information and services more conveniently and flexibly. An investigation of the official websites of 31 public libraries and 39 academic libraries of Project 985 universities① in China shows that by November 14, 2014, 19 public libraries and 35 academic libraries have provided mobile services, accounting for 61.3% of the surveyed public libraries and 90% of the surveyed college libraries, respectively. However, in spite of the prevalence of mobile library services, the usage of the services is reported to be relatively low[2–5].

Since the 1960s and 1970s, researchers have studied user acceptance of an information technology and their research has yielded several competing models, such as technology acceptance model (TAM)[6], innovation diffusion theory (IDT)[7], unified theory of acceptance and use of technology (UTAUT)[8], etc. These models have been tested and verified in studies worldwide in explaining and predicting user acceptance of information systems. However, not enough attention was paid to the non-users of information systems and different user groups. Some

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① Initiated on May 4, 1998, Project 985 is aimed at promoting the Chinese higher education system by founding world-class universities in the 21st century. Thirty-nine universities have been included in the project by the end of 2011.

researchers pointed out this issue and conducted studies to enhance our understanding of potential adopters and the difference between different user groups. For example, Liu & Luo[9] explored the extent to which undergraduate and graduate students in China differ in the dimensions of digital library use, such as non-use factors, perceived influences and degree of satisfaction due to their different emphases and expectations for information.

There were a few empirical studies[10–12] on factors influencing user intention to use mobile library systems. However, they did not differentiate between current users and potential adopters. As a result, very little is known about potential users and the reasons why they might use mobile libraries but do not. This study attempts to learn more about potential users by exploring how factors influencing the adoption of mobile library systems are different for current users and potential adopters. The research findings may provide academic libraries with insights into the ways of promoting mobile library usage, providing customized information services and improving current users' satisfaction.

2   Theoretical background and related work

Technology acceptance model (TAM) and unified theory of acceptance and use of technology (UTAUT) are two wildly used information technology acceptance models. Although UTAUT has relatively more explanatory power, the measure of critical factors in UTAUT is based on the scales from the theory of reasoned action (TRA), TAM, IDT and other models[13]. Considering the fact that mobile library services are relatively new in China and the usage rate is at a low level, we have built our research model on the basis of TRA and TAM for the best explanation power and greater generalizability of the results from this study.

2.1   TRA and TAM

Proposed by Fishbein & Ajzen[14] in 1975, the theory of reasoned action (TRA) provides a framework to study how attitude impacts behavior in psychology research. According to the theory, the most important determinant of a person's behavior is behavior intention. The individual's intention to perform a behavior involves attitude toward performing the behavior and subjective norms surrounding the performance of the behavior. Attitude is defined as "an individual's positive or negative feelings (evaluative affect) about performing the target behavior", and subjective norm is "the person's perception that most people who are important to him think he or she should or should not perform the behavior in question". TRA and its extensions have been widely used in the prediction of behavioral intention[15].

Technology acceptance model (TAM) is a theory that models how users come to accept and use an information technology. It was first created by Davis[6] in 1986.

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Based on the TRA, TAM proposes that perceived ease of use and perceived usefulness of a technology are predictors of user attitude toward using the technology, subsequent behavioral intention and actual usage. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" and perceived ease of use is "the degree to which a person believes that using a particular system would be free of effort"[6].

2.2 Related work

Literature review indicates that TAM has strong explanatory power in the study of the use of digital libraries and the influencing factors can be divided into core factors (perceived usefulness and perceived ease of use), individuals-related factors (age, gender, computer self-efficacy, etc.) and technology-related factors (interface design, navigation, system accessibility, and system functions)[16].

There were some empirical studies about factors influencing college students' intention to use mobile library systems. Based on a sample of 90 students, Goh[17] put forward the research model with TAM as the foundation to investigate gender differences in students' perception of a library catalog search service via short message service (SMS). Huang & Yang[10] revealed that perceived ease of use, perceived usefulness, self-efficacy, facilitating conditions, attitude and subjective norm are critical factors influencing Chinese college students' behavioral intention to use mobile library systems. Ming et al.[11] examined factors that affect college students and teachers' intention to use mobile library systems by applying TAM and including some other variables, such as social influence, perceived enjoyment, systematic features, interface, perceived cost, etc., in their research model. They discussed 4 dominant factors (perceived usefulness, perceived trust, perceived ease of use and individual innovation) that influence users to accept mobile library systems. Jin's empirical study[12] based on UTAUT found that content variety, self-efficacy, facilitating conditions and subjective norm have a positive influence on college student's behavioral intention to use mobile library systems. Deng & Yang[18] discovered that college students' perceived use of a mobile system has a greater impact on their continued usage of the system than system quality or service quality.

3 Research model and hypotheses

According to the characteristics of the mobile library system, we built a research model as described in Fig. 1. In this research, behavioral intention is defined as the willingness or intention to use mobile library systems.

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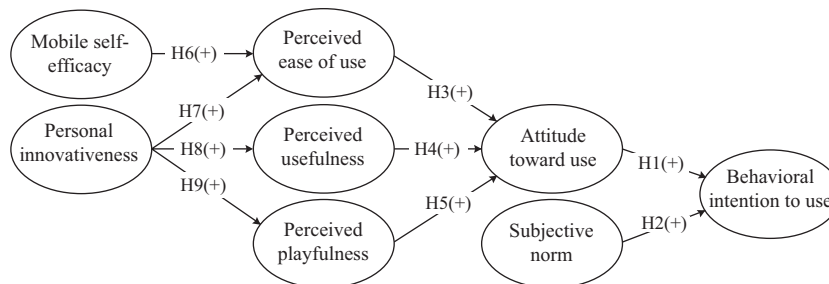
Fig. 1   Research model.

3.1   Attitude and subjective norm

We define attitude as an individual's positive or negative feelings about the use of mobile library systems, and subjective norm as an individual's perception that most people who are important to him or her think he or she should or should not use mobile library systems. Studies[10,19] indicate that attitude is positively correlated to acceptance and usage of information systems. According to theories of conformity in social psychology[20], group members tend to comply with the group norm, and moreover this in turn influences the perceptions and behavior of group members. College students can be members of many groups, both formal and informal, in their schools or colleges. For mutual benefits, they tend to take advice given by group members such as teachers and fellow students seriously, being influenced by others' opinions before they make their own decisions[12]. Therefore we hypothesize:

H1: Attitude toward use has a positive impact on behavioral intention to use.
H2: Subjective norm has a positive impact on behavioral intention to use.

3.2   Perceived usefulness, perceived ease of use and perceived playfulness

In this study, perceived usefulness is the degree to which using the mobile library system is an effective way for a user to obtain the needed information and enhance his or her learning efficiency and job performance; perceived ease of use is defined as the degree to which the mobile library system is not difficult to use, but convenient and easy to use. Under the context of using the mobile library system, on the one hand, users will hold a positive attitude toward the mobile library system if they perceive the system as easy to use. On the other hand, their positive attitude is evident when using the library system to complete tasks such as searching catalogs or renewing books brings benefits to their studies or jobs. Therefore we hypothesize:

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H3: Perceived ease of use has a positive impact on attitude toward use of the mobile library system.

H4: Perceived usefulness has a positive impact on attitude toward use of the mobile library system.

In this research, perceived playfulness is defined as the degree to which a person believes that interaction with the mobile system is pleasant and full of fun. Moon & Kim[21] found that perceived playfulness was positively related to users' attitude toward World-Wide-Web (WWW). Fang et al.[22] pointed out that task type such as transactions and gaming moderated the effect of perceived playfulness on user intention to use wireless technology. Under the mobile service context, users who enjoy the pleasure of using the mobile system will tend to believe that the mobile system is not difficult to use and try to use it[11], which helps them form a positive attitude about using the mobile system. Therefore we hypothesize:

H5: Perceived playfulness has a positive impact on attitude toward use of the mobile library system.

3.3 Individual differences

3.3.1 Mobile self-efficacy

Mobile self-efficacy in this study refers to individuals' judgment of their capabilities to use mobile devices in diverse situations. Zmud[23] first examined theoretically the relationship between individual differences and the information system success. Research results[24,25] in the field of information systems also indicate that individual differences have an impact on individuals' acceptance or use behavior of an information technology. Based on previous studies, Compeau & Higgins[26] put forward the concept of "computer self-efficacy" in 1995, which was defined as an individual's beliefs about their abilities to competently use computers. At the same time, Venkatesh & Davis[27] observed that individual's perception of a particular system's ease of use was anchored to her or his general computer self-efficacy at all times. Mobile library is a kind of complicated information system and its users are supposed to be capable of basic mobile system operation skills. The more confident a user is in his or her mobile self-efficacy, the higher his or her perception of the mobile library system's ease of use. Therefore we hypothesize:

H6: Mobile self-efficacy has a positive impact on perceive ease of use.

3.3.2 Personal innovativeness

Personal innovativeness is defined as a person's readiness to accept new ideas or the degree to which a person will change his or her decisions based on their

communication with others. It was first proposed by Agarwal & Prasad[28] on the basis of Rogers' innovation diffusion theory (IDT)[7]. Lu et al.[29] found that personal innovativeness influenced perceived ease of use and perceived usefulness directly and impacted user acceptance indirectly. In our study context, when facing the newly-developed mobile library system, the highly innovative individuals who are active information seekers about new ideas and early adaptors of new technologies are more likely to use it. With curiosity about new technologies, they pay more attention to the benefits of using the new mobile system. Meanwhile, their previous experience in using information systems such as digital libraries will help them operate the mobile system more easily and have more pleasure in using the system. Therefore we hypothesize:

H7: Personal innovativeness has a positive impact on perceived ease of use.
H8: Personal innovativeness has a positive impact on perceived usefulness.
H9: Personal innovativeness has a positive impact on perceived playfulness.

4 Methodology

4.1 Questionnaire design

A questionnaire was designed based on the proposed research model. There are 8 latent variables in the research model with 3 to 4 observation variables each. To ensure the content validity of the scales, the measurement items of the questionnaires were developed from the previous literature. Respondents were asked to indicate their status: Current users who are using the mobile library system or potential users who have yet to adopt the system but have the intention to use it in the future. After the instrument was developed, a pilot survey was conducted among 15 users: 10 undergraduate students and 5 graduate students from different disciplines of Wuhan University in China. Based on their feedback and comments, we adjusted wordings in some items to improve the understandability of the questionnaires. The final instrument was presented in Table 1. All items were measured on a 7-point Likert-type scale (1 – strongly disagree; 3 – mildly disagree; 5 – mildly agree; 7 – strongly agree).

4.2 Data collection

Our survey collected data for 4 weeks through an online survey website (www. sojump.com) and visits to Wuhan University Library for soliciting library patrons' participation. A total of 210 valid questionnaires were collected from April to May, 2014. Of the 210 respondents, 30% (63/210) indicated they were current users and 70% (147/210) potential adopters (Table 2). There were more females than males

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Table 1 Measurement instrument

Construct	Item	Measure	Source
Perceived usefulness (PU)	PU1	Using mobile library increases the effectiveness of my performance.	Taylor & Todd[19]; Moon & Kim[21]; Lu et al.[29]
	PU2	Using mobile library enables me to accomplish tasks more conveniently and quickly.	
	PU3	Mobile library is useful to me.	
Perceived ease of use (PEU)	PEU1	Learning to operate the mobile library system is easy for me.	Taylor & Todd[19]; Moon & Kim[21]; Lu et al.[29]
	PEU2	The content of mobile library services is clear and understandable.	
	PEU3	It is easy for me to become skillful at using the mobile library system.	
	PEU4	I find it easy to get information resources that I need through the mobile library system.	
Perceived playfulness (PP)	PP1	When using the mobile library system, I do not realize the time has elapsed quickly.	Moon & Kim[21]; Fang et al.[22]
	PP2	When interacting with the mobile library system, I am not aware of any noise.	
	PP3	When interacting with the mobile library system, I often forget the work I have to do.	
	PP4	I feel very happy when using the mobile library system.	
Personal innovativeness (PI)	PI1	If I hear about a new information technology, I will look for ways to experiment with it.	Agarwal & Prasad[28]; Lu et al.[29]
	PI2	In general, I am not hesitant to try out new information technologies.	
	PI3	Among my peers, I am usually the first to explore new information technologies (or one of the earlier adopters).	
	PI4	I like to experiment with new information technologies.	
Mobile self-efficacy (MSE)	MSE1	I could complete my task using the mobile library system even if there was no one around to tell me what to do.	Compeau & Higgins[26]; Venkatesh & Davis[27]
	MSE2	I could complete my task using the mobile library system even if I had never used a technology like it before.	
	MSE3	I could complete my task using the mobile library system if I had only the manuals for reference.	
	MSE4	I could complete my task using the mobile library system if I had never seen anyone else using it before trying it myself.	
Subjective norm (SN)	SN1	My professors would think that I should use the mobile library system.	Zha et al.[15]; Taylor & Todd[19]
	SN2	Generally speaking, I want to do what my professors think I should do.	
	SN3	My classmates or friends would think that I should use the mobile library system.	
	SN4	Generally speaking, I want to do what my classmates or friends think I should do.	
Attitude toward use (AA)	AA1	Using mobile library brings value to me.	Venkatesh et al[8]; Taylor & Todd[19]; Moon & Kim[21]
	AA2	It is pleasant to use the mobile library system.	
	AA3	It is wise to use the mobile library system.	
Intention to use (UI)	UI1	I am willing to learn how to use the mobile library system this term.	Taylor & Todd[19]; Moon & Kim[21]
	UI2	I am ready to use the mobile library system this term.	
	UI3	I will recommend others to use the mobile library system.	

Table 2   Respondents' demographic information

Classification	Characteristics	Current user (*N*=63)		Potential adopter (*N*=147)	
		Frequency	Percentage (%)	Frequency	Percentage (%)
Gender	Male	28	44.4	66	44.9
	Female	35	55.6	81	55.1
Age	≤18 years old	3	4.8	6	4.1
	19–23 years old	41	65.1	107	72.8
	24–28 years old	19	30.2	32	21.8
	29–33 years old	0	0	1	0.7
	≥34 years old	0	0	1	0.7
Education level	Bachelor's degree	28	44.4	92	62.6
	Master's degree	34	54.0	44	29.9
	Doctoral degree	1	1.6	7	4.8
	Others	0	0	4	2.7
Understanding of mobile library system	Never heard of it	0	0	31	21.1
	A little knowledge	25	39.7	97	66.0
	Basic knowledge	31	49.2	19	12.9
	Very familiar	7	11.1	0	0

among the respondents with a majority in the 19–23 age group. Most of them received higher education and were awarded bachelor's or master's degrees.

5   Data analysis and results

5.1   Measurement model validation

The results of the reliability and validity of the constructs were presented in Tables 3–5. Our data indicates good reliability of factors as the Cronbach's alpha values of all constructs were over 0.8, which is considerably higher than the suggested acceptable value of 0.7[30]. The composite reliability co-efficiencies of all latent variables exceeded the threshold of 0.7[30], which indicates a high degree of internal consistency of all the constructs.

Convergent validity was evaluated using the average variance extracted (AVE). Table 3 shows that the AVE values of all constructs were all above 0.6 (above the cut-off value of 0.5[30]), which suggests higher convergent validity of all the constructs. As for discriminative validity, Tables 4 and 5 illustrate that discriminant validity was adequate since the square root of each construct's AVE was larger than its correlation with the other constructs. Although some variables were found to have relatively higher correlation coefficients, as shown in Tables 4 and 5, none of them were greater than 0.8, and the variance inflation factor of each independent variable was less than 4[31], indicating that no multicollinearity existed among variables and the measurement result was reliable.

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Table 3　Confirmatory factor analysis

Construct	Current user				Potential adopter			
	Item[a]	CR	AVE	Cronbach's Alpha	Item[a]	CR	AVE	Cronbach's Alpha
PU	3	0.937	0.831	0.899	3	0.924	0.802	0.878
PEU	4	0.932	0.775	0.903	4	0.935	0.784	0.907
PP	4	0.889	0.668	0.845	1	1	1	1
MSE	4	0.914	0.729	0.874	4	0.949	0.823	0.928
PI	3	0.884	0.719	0.806	3	0.892	0.734	0.824
SN	4	0.899	0.692	0.865	4	0.895	0.682	0.845
AA	3	0.912	0.776	0.858	3	0.948	0.859	0.918
UI	3	0.947	0.856	0.916	3	0.945	0.851	0.912

Note: [a] Items with a low factor loading have been deleted.

Table 4　Construct correlations and square roots of AVEs (current users)

No.	Construct	1	2	3	4	5	6	7	8
1	AA	**0.881**							
2	MSE	0.405	**0.854**						
3	PEU	0.510	0.650	**0.880**					
4	PI	0.494	0.549	0.506	**0.848**				
5	PP	0.442	−0.017	0.187	0.213	**0.817**			
6	PU	0.717	0.332	0.603	0.322	0.367	**0.912**		
7	SN	0.403	0.472	0.380	0.350	0.317	0.319	**0.832**	
8	UI	0.706	0.507	0.441	0.468	0.292	0.563	0.606	**0.925**

Note: The bold diagonal elements in the correlation matrix are the square roots of the AVE of each construct.

Table 5　Construct correlations and square roots of AVEs (potential adopters)

No.	Construct	1	2	3	4	5	6	7	8
1	AA	**0.927**							
2	MSE	0.571	**0.907**						
3	PEU	0.541	0.593	**0.886**					
4	PI	0.427	0.559	0.433	**0.857**				
5	PP	0.356	0.106	0.318	0.260	**1.000**			
6	PU	0.655	0.414	0.510	0.358	0.493	**0.896**		
7	SN	0.649	0.602	0.523	0.497	0.212	0.495	**0.826**	
8	UI	0.758	0.547	0.577	0.391	0.368	0.567	0.604	**0.922**

Note: The bold diagonal elements in the correlation matrix are the square roots of the AVE of each construct.

5.2　Independent-samples *t*-test

An independent samples *t*-test was conducted to examine whether current users and potential adopters significantly differ from each other in terms of various factors. Specially, the score of each latent variable is the sum of the scores of its indicators. The results revealed a statistically significant difference in all factors except perceived playfulness and subjective norm for the two groups of users (Table 6).

Table 6   *T*-test result

Independent variable	Current user		Potential adopter		*t*	Sig.
	Mean	Std. Deviation	Mean	Std. Deviation		
Perceived usefulness	16.49	3.459	14.03	3.531	4.651	0.000
Perceived ease of use	21.78	4.097	18.39	4.733	4.945	0.000
Perceived playfulness	13.94	4.728	14.71	4.169	−1.189	0.236
Mobile self-efficacy	20.83	3.875	17.99	4.643	4.257	0.000
Personal innovativeness	18.22	3.799	16.13	4.018	3.515	0.001
Subjective norm	19.73	4.746	19.14	4.093	0.907	0.365
Attitude toward use	15.94	2.822	14.49	3.387	2.975	0.003

5.3   Test of the structural model

The bootstrapping algorithm was used to examine the proposed model. Figures 2 and 3 explain each model's proven hypothesis, where solid lines indicate significant impacts and dotted lines insignificant impacts.

5.3.1   Model of current users

Figure 2 shows that 7 out of 9 hypotheses were supported. Contrary to our expectation, perceived ease of use did not have a significant effect on attitude toward use and personal innovativeness was not significantly related to perceived playfulness. Therefore, H3 and H9 were not supported. The explained variances (R^2) value of behavioral intention was 0.621, showing the model of current users had good predictive validity.
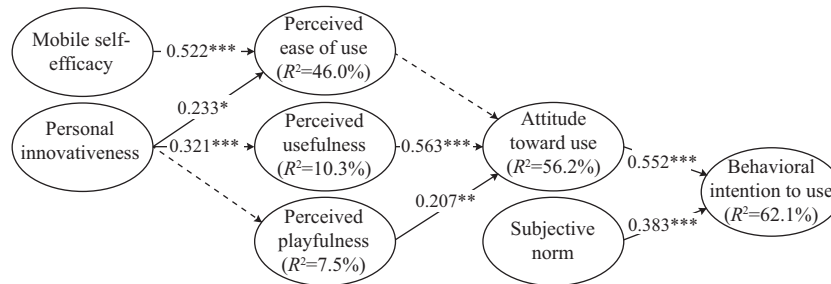

Fig. 2   Structural model analysis (Current users).
Note: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Among the three factors influencing attitude, perceived usefulness and perceived playfulness were more important factors, as indicated by their path coefficient of 0.563 ($p<0.001$) and 0.207 ($p<0.01$), respectively. This also indicates attitude was mainly affected by perceived usefulness. In addition, subjective norm had a positive

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impact on current users' behavioral intention ($p<0.001$). With regards to individual differences, mobile self-efficacy was significantly correlated to perceived ease of use; personal innovativeness had a significant impact on perceived usefulness and perceived ease of use, but had no impact on perceived playfulness.

5.3.2 Model of potential adopters

For potential adopters' model (Fig. 3), 7 out of 9 hypotheses were supported. H5 and H7 were rejected, that is perceived playfulness had no positive impact on attitude toward use and perceived innovativeness had no positive effect on perceived ease of use. It was found that the proposed model can explain 59.7% of the variance in users' behavior intention, showing the model had strong explanatory power. Attitude and subjective norm had a path coefficient of 0.633 ($p<0.001$) and 0.193 ($p<0.001$), respectively, which indicates that behavioral intention of potential adopters were mainly influenced by their attitude toward use. Perceived usefulness and perceived ease of use had positive impacts on attitude. In terms of individual differences, mobile self-efficacy was significantly correlated to perceived ease of use, and personal innovativeness had a significant impact on perceived usefulness and perceived playfulness, but no impact on perceived ease of use.
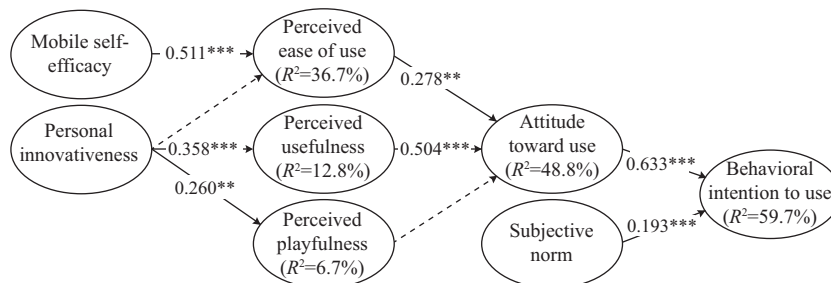

Fig. 3   Structural model analysis (potential adopters).
Note: ** $p<0.01$, *** $p<0.001$.

6   Discussions and conclusions

6.1   Research results and analysis

The proposed research model possesses strong explanatory power to predict users' intention to use the mobile library system. Analysis on the direct effects and indirect effects of various factors on behavioral intention and implications for practice is provided as follows.

6.1.1 TRA-related variables

Our results show that attitude toward use and subjective norm have a significant and positive effect on use intention for both current users and potential adopters. This is consistent with Huang & Yang's[10] findings. Compared with subjective norm, attitude has a stronger effect on behavioral intention to use. This implies that academic libraries may help their users adopt a positive attitude to their mobile system by enhancing people's motivation and pointing out benefits of using the mobile system (i.e. improvement of efficiency of work performance, pleasure of using the mobile system) through persuasive information campaigns. Figures 2 and 3 show that subjective norm has a strong significant influence on the use intention of current users (β=0.383, p<0.001) and of potential adopters (β=0.193, p<0.001). This suggests that academic libraries may encourage faculty members and students' classmates to promote mobile library services on campus.

6.1.2 The antecedents of attitude

Our study shows that perceived usefulness has a significant effect on attitude of both current and potential users, which supports Ming et al.'s[11] argument. However, we found that perceived ease of use and perceived playfulness have different effects on different users.

Figure 2 illustrates that perceived ease of use does not have a significant impact on current users' attitude to use. But Table 4 shows that the correlation coefficient between perceived ease of use on attitude to use for current users was 0.510, which indicates the impact of perceived ease of use on attitude may be reduced by perceived usefulness and perceived playfulness. The possible reason is that current users continue to use mobile library system out of consideration for the system's usefulness and playfulness since they, as experienced users, have already had a better understanding of the system structure, navigation settings, responsiveness, stability and the way of how information displays in the system and they are capable of accessing needed information and services in an easy way.

In addition, we found that perceived playfulness has a significant effect on current users' attitude to use the system. This is inconsistent with Ming et al.'s[11] study, in which they reported perceived playfulness had no impact on behavioral intention to use the mobile library system. One reason might be that current users have a higher level of engagement with the mobile system, so their decision of continuous use is based not just on the usefulness of the mobile system but also on the pleasure they can get from the process of using the mobile system. For potential adopters, however, using the mobile system for study or work rather than entertainment is more

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important. The result supports Fang et al.'s[22] finding that task type moderates the effects of perceived playfulness on behavioral intention. Thus, distinguishing current users from potential adopters is conducive for academic libraries to provide customized services and attract more potential adopters of the mobile library system.

6.1.3 Individual differences

Figures 2 and 3 illustrate that mobile self-efficacy has a significant effect on perceived ease of use for the two groups of users, which is in line with Jin's study[12]. Furthermore, Ming et al.'s finding[11] of the positive influence of personal innovativeness on perceived usefulness was confirmed in our study. Based on these research findings, we suggest academic libraries encourage and support users with high mobile self-efficacy or high personal innovativeness to try their mobile services first.

6.2 Limitations and future research directions

As shown in Figs 2 and 3, both models explain a significant proportion of the variance in individuals' intention to use the mobile library system. Current user model accounted for 62.1% of the variance and potential adopter model explained 59.7% of the behavioral intention variance, which implies that some other influencing factors, such as information quality, system quality and service quality should also be included in the research model[18]. Moreover, although the sample size was large enough to attain statistical significance, the participants were mainly college students. However, faculty members and researchers also make up of academic library clienteles and further studies to include them in the sample may produce more useful results.

Author contributions

H.J. Yang (yanghaijuan1990@163.com, corresponding author) designed the study and question-naires, collected and analyzed data, wrote and revised the paper. S.S. Gui (sgui0229@whu.edu.cn) participated in data analysis and paper revision.

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