Predicting information-seeking intention in academic digital libraries

Chiao-Chen Chang

Department of Business Administration, Tamkang University, Tamsui, Taiwan, Republic of China,

Chia-Yen Lin

Department of Information Management, Chia Nan University of Pharmacy & Science, Tainan, Taiwan, Republic of China

Yu-Chin Chen

Department of Information Management, Kao Yuan University, Lu-Chu, Taiwan, Republic of China, and

Yang-Chieh Chin

Department of Management Science, National Chiao Tung University, Taipei, Taiwan, Republic of China

Abstract

Purpose – The purpose of this paper is to examine and predict users' information-seeking intention regarding academic digital library services, using the theory of reasoned action (TRA) and the theory of planned behavior (TPB).

Design/methodology/approach – Data are collected from 224 Taiwanese undergraduate and graduate students to assess the influence of attitude, subjective norm, and perceived behavioral control on the intention to seek information in an academic digital library. The results of structural equation model-fitting analyses show that the TPB is better than the TRA in predicting the information-seeking intention in an academic digital library.

Findings – Specially, the empirical results indicated that perceived behavioral control is a better predictor of behavioral intention than is attitude or subjective norm.

Research limitations/implications – This paper assessed self-reported information-seeking intention as part of the survey and, as a result, could have introduced inaccuracies.

Practical implications – The findings of the paper will help academic digital libraries to address the key factor which influences users' intention to seek information and to intensify their performance to meet user needs.

Originality/value – Although the nature of the user experience in the digital environment appears to be quite different from the experience of looking through archival boxes or folders, research on the use of academic digital library services is scarce – particularly regarding user intention in the process of seeking information. The TRA and TPB are novel and usable in explaining the intention of online users to seek information, and these findings may be generally applicable to academic digital libraries and users.

Keywords Academic libraries, Digital libraries, Taiwan, University libraries, User studies

Paper type Research paper

1. Introduction

Information technology has leveraged both new and old ways to seek resources to provide better services to their users. Library users are now offered a variety of academic resources with different forms of interactivity (e.g. academic networks vs offline libraries) and with different levels of media richness (e.g. text vs graphics-supported). They can obtain research data and publications as needed without the massive investment of capital and infrastructure to house vast physical collections. Information-seeking in digital libraries has become an indispensable tool in academia, and personal use is increasing every day. Empirical evidence has pointed out that users make frequent use of the Internet to search for specific academic information, and users' searches for specific academic resources are the main trend in the field of Library & Information Science. With the rapid development of the internet, its embrace by the library and information community has enabled the concept of the digital libraries (Shen *et al.*, 2008). University libraries in Taiwan have cooperated to establish the Taiwan Academic Digital Library, which aims to integrate all the achievements and resources of research and to connect to the international academic community. Perhaps, most importantly, academic digital libraries increase the probability of users finding needed resources (Dillon, 2000). The first purpose of this study is to present the results of confirmatory factor analyses examining users' intention to seek information in an academic digital library, and to explain these analyses in light of the theory of reasoned action (TRA) and the theory of planned behavior (TPB).

Academic digital libraries can integrate research resources and enable users to seek specific information in virtual space. Increasingly, some sources of information, such as online databases, electronic bulletin boards, and local magnetic or optical databases, are available only in academic form. The role of information-seeking in the online environment (Shim *et al.*, 2001) and the nature of user experience in the digital environment is vastly different from that of looking through archival boxes or folders – yet there has been very little research on the use of academic digital library services, and particularly on user intention in the process of seeking information. The constructs in interpreting the information-seeking intention in the digital environment should be clear in the context of academic library research (Matusiak, 2006). Based on the TPB, this study added an analysis of perceived behavioral control to clarify individuals' intentions and behavior (Ajzen, 1991). Then we attempt to fill the scarce in a web-based opinion to infer that users' perceived behavioral control toward information-seeking will be a primary differentiator between offline academic libraries and academic digital libraries.

In addition to examining the causal antecedents of the information-seeking intention in academic digital libraries and testing the model fit for exhibiting the antecedent similarities and differences between the TRA and TPB, the second purpose of this study is to empirically test the role that perceived behavioral control plays in developing the information-seeking intention.

2. Literature review

The antecedents of this research focus on the TRA and the TPB.

2.1 Theory of reasoned action and theory of planned behavior

The TRA and the TPB have been used extensively in predicting a broad range of behaviors (Kang *et al.*, 2006; Sharma and Kanekar, 2007; Shim *et al.*, 2001). In the TRA, the most immediate and important predictor of behavior is the person's intention to

perform the behavior, e.g. "I intend to use traditional coupons" (Kang *et al.*, 2006). As seen in Figure 1, TRA is related to voluntary behavior, and it consists of attitude, subjective, and intention (Fishbein and Ajzen, 1975). Later on, behavior appeared not to be 100 percent voluntary and under control, resulting in the addition of perceived behavioral control to the theory. With this addition, the theory was called the TPB (Figure 2). By extending the TRA (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975), the TPB addresses the original model's limitations in dealing with behaviors over which people have incomplete volitional control. Ajzen (1985) noted that, because most behaviors are not under complete volitional control, perceived behavioral control results from underlying control beliefs with regard to resources, opportunities, past experiences, and information about others' experiences.

According to the TPB, attitudes, subjective norm, and perceived behavior control influence behavior primarily by their impact on behavioral intention (Figure 2). Intention is revealed as the proximal determinant of behavior, and perceived behavioral control is thought to have both indirect (via intention) and direct effects on behavior – with direct effects occurring when the individual's perceptions of control match the actual amount of control the individual is able to exercise. Thus, the main differences between the TRA and TPB are that the TPB suggests human decision-making is only partly, not fully, under the control of people concerned. The TRA adds the concept of "perceived behavioral control" to the model.
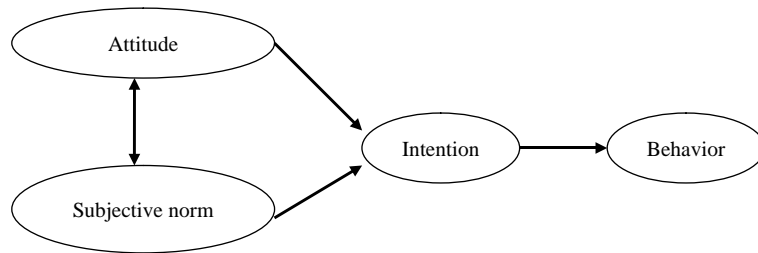
Figure 1.
A conceptual model of the theory of reasoned action

Source: Fishbein and Ajzen (1975)
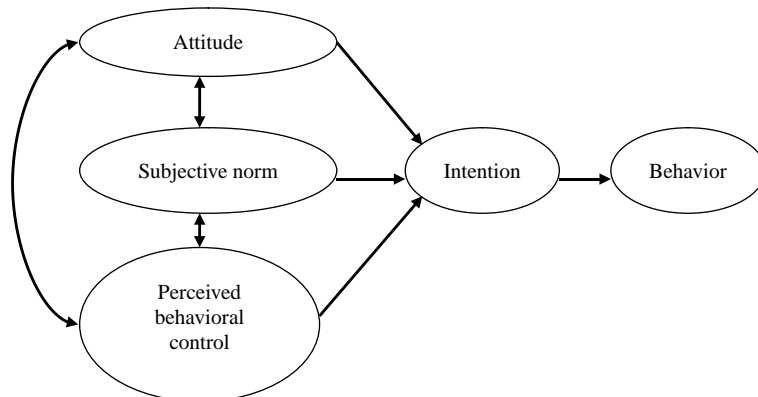
Figure 2.
A conceptual model of the theory of planned behavior

Source: Ajzen (1985)

We apply the theories to determine whether the information-seeking in an academic digital library can be predicted by the components of the TRA and TPB. Past studies have shown that the TPB is better than the TRA at predicting behavioral intention (Hansen *et al.*, 2004; Kang *et al.*, 2006; Wang *et al.*, 2007). In addition, the effects of perceived behavioral control under the circumstances of Internet use will play a more important role than it would in the brick-and-mortar environment. So we infer that the additional attribute for the TPB will have significant effects on predicting the intention to use an academic digital library; thus, the TPB will show a better model-fit than will the TRA:

H1. The theory of planned behavior will significantly predict information-seeking intention in an academic digital library better than will the TRA.

2.2 Behavioral intention (BI)
The TRA and TPB cannot explain how intention translates into behavior or why people cannot always behave in accordance with their intentions (Bagozzi *et al.*, 1992). This work, unlike previous research on the subject, separated the user behavior and the user intention into different dimensions.

Matusiak (2006) defined information-seeking as "a fundamental human activity in the process of gathering information and building knowledge" and contended that "the process of information-seeking is not unique to the digital environment." Klein (1998) proposed that information search facilities on the Internet are particularly useful for search resources because of the low perceived costs of providing and assessing objective data.

2.3 Attitude (ATT)
Fishbein and Ajzen (1975) assumed that attitude is a one-dimensional construct. Attitude toward the behavior is determined by a person's beliefs that the behavior will lead to certain outcomes and by the person's evaluation of those outcomes as favorable or unfavorable (Ajzen and Fishbein, 1980). The more positive attitude toward online information-seeking would lead to the greater the intention to seek information in an academic digital library:

H2. Attitude toward information-seeking in an academic digital library will positively predict information-seeking intention in an academic digital library.

2.4 Subject Norm (SN)
Subjective norm derives from a person's perceptions of what relevant others – such as family, friends, or co-workers – are likely to think about the behavior, as well as the extent to which the person wishes to comply with those relevant others (Ajzen and Fishbein, 1980). Mathieson (1991) and Taylor and Todd (1995) proposed that the subjective norm has manifested itself as peer influence and as a superior influence in the context of technology usage. Overall, then, the subjective norm could be expressed as the sum of the individual's perceptions and motivations for all relevant referents:

H3. The subjective norm will positively predict information-seeking intention in an academic digital library.

2.5 Perceived behavioral control (PBC)
Expansion of the TRA added the variable of perceived behavioral control (PBC) to describe the intention prediction (Ajzen, 1985). Perceived behavioral control derives from Bandura's (1986) concepts of self-efficacy and refers to the person's perception of

ease or difficulty in performing the behavior (Ajzen, 1991). Ajzen considered the PBC construct of TPB as identical to self-efficacy. The TPB views the control that people have over their behavior as being on a continuum from behaviors that are easily performed to those requiring considerable effort, resources, etc. In a web-based context, we assume that perceived behavioral control can be a significant predictor to explain the intention to seek information from academic digital libraries:

H4. Perceived behavioral control will positively predict information-seeking intention in an academic digital library.
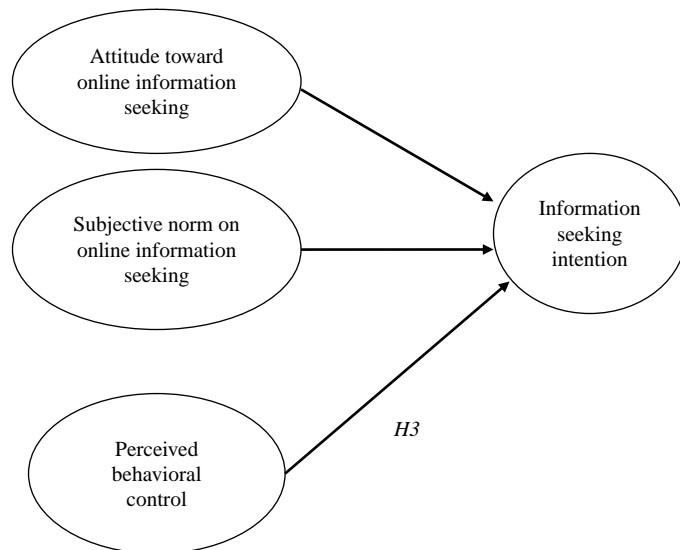
3. Methodology

3.1 Research model

Model 1 (Figure 3) presents the TRA and includes the consumer's attitude toward online information-seeking and the subjective norm on online information-seeking. Model 2 (Figure 4) shows the TPB and includes perceived behavioral control to predict
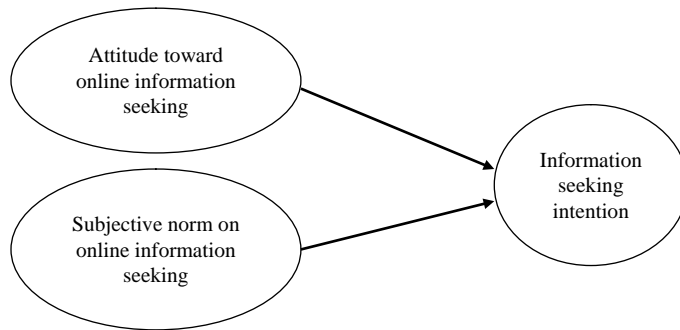
Figure 3.
The structure of the information seeking intention for the TRA

Figure 4.
The Structure of the information seeking for the TPB

the information-seeking intention; the addition of this construct reflects that the Internet is perceived to be a powerful tool for users seeking information in general.

3.2 Sample and procedure

A total of 250 undergraduate and graduate students from a university in Northern Taiwan participated in the survey. Questionnaires were distributed inside the campus' library and canteens. Participants were asked to complete a self-reported questionnaire containing study measures for the intention to seek information in an academic digital library. Of the 260 surveys distributed, 224 were returned (86 percent response rate). The majority of the subjects were between the ages of 21 and 30, and 54.9 percent of the subjects were female. Participants' educational level varied: 66.5 percent ($n = 149$) had completed college/university and 33.5 percent (n $= 75$) reported an educational level higher than college/university. Among the subjects, 37.9 percent used the Internet daily for more than 5 h, 23.2 percent for 3-5 h, 23.7 percent for 1-3 h, and 15.2 percent for less than an hour. Most respondents had sufficient computer skills for using online searching systems.

3.3 Measures

The components of the TPB were manipulated by a 21-item questionnaire that was constructed according to guidelines proposed by Ajzen (1988) and Ajzen and Fishbein (1980). The scale was a 5-point, Likert-type, ranging from $1 =$ strongly disagree to $5 =$ strongly agree. For instance, the information-seeking intention in an academic digital library was measured with three items: "All things considered, I tend to search for information in an academic digital library (BI 1)," "I think academic resources on the digital library web site are beneficial (BI 2)," and "In the future, I intend to search for information in an academic digital library routinely (BI 3)". Reponses were averaged to create an index of behavioral intention ($\alpha = 0.95$). High Cronbach's alpha coefficients show that the measures have a good level of internal reliability (Cronbach, 1951).

Evaluative measures were used to assess attitudes. The attitude toward online information-searching in an academic digital library was assessed with four five-point semantic differential scales: foolish/wise (ATT 1), waste of time/wise use of time (ATT 2), useless/useful (ATT 3), worthless/valuable (ATT 4), and bad/good (ATT 5). Hagger and Chatzisarantis (2005) suggested that the affective and instrumental components of these differential scales capture the essence of the attitude construct and, even though they can be distinguished at the conceptual and empirical level, adequately form a global, unitary attitude construct. Respondents were rated on a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree), and items were scored such that higher scores indicate a more positive attitude toward information-seeking in an academic digital library ($\alpha = 0.79$).

In accordance with Kang *et al.* (2006), the subjective norm about information-seeking in an academic digital library were assessed with three items: "My teachers probably consider my information-searching of academic digital library to be wise, wise use of time, useful, valuable, and good (SN 1)," "My friends probably consider my information-searching of academic digital library to be wise, wise use of time, useful, valuable, and good (SN 2)," and "My classmates probably consider my information-searching of academic digital library to be wise, wise use of time, useful, valuable, and good (SN 3)." The three items were rated on five-point Likert-type scales,

indicating $1 =$ strongly disagree to $5 =$ strongly agree. Reponses were averaged to create an index of the subjective norm ($\alpha = 0.86$), with higher scores indicating a greater perceived normative support for information-seeking in an academic digital library.

Perception of control over information-seeking in an academic digital library was assessed by three questions: "It takes little time to use the academic digital library services to search for information (PBC 1)," "It is easy for me to find the library information I need on the academic digital library web site (PBC 2)," and "There are few obstacles for me to search the information in an academic digital library (PBC 3)." Items were scored on five-point scales, indicating $1 =$ strongly disagree to $5 =$ strongly agree, with a higher score indicating greater perceived control over information-seeking in an academic digital library ($\alpha = 0.94$).

4. Results

A confirmatory factor analysis was conducted using AMOS 7.0 (Arbuckle and Wothke, 1999) with the Maximum Likelihood algorithm to identify the factors. Then structural equation modeling was used to validate the model for predicting the information-seeking intention. To assess the adequacy of the measurement models, we conducted a confirmatory factor analysis in the first step of data analysis. Standardized loadings (all significant at $P < 0.001$) and the item reliabilities suggest that the constructs' items cohere reasonably well (Table I). The analysis of the disconfirmation model of the information-seeking intention given in Figure 5 and Figure 6 followed the two-step approach suggested by Anderson and Gerbing (1988), with the measurement models examined first, followed by the structural equation models.

The second step in the data analysis was to compare the structural models. Figure 5 and Figure 6 show the specification of the models we examined. The overall fit of the structural models (i.e. Model 1 in Figure 5 and Model 2 in Figure 6) were first assessed

Factors	Cronbach's α	Factor loadings
Attitude	0.79	
ATT 1		0.69
ATT 2		0.69
ATT 3		0.68
ATT 4		0.56
ATT 5		0.64
Subjective norm	0.86	
SN 1		0.83
SN 2		0.88
SN 3		0.78
Perceived behavior control	0.94	
PBC 1		0.92
PBC 2		0.91
PBC 3		0.91
Behavioral intention	0.95	
BI 1		0.89
BI 2		0.96
BI 3		0.94
Note: All factor loadings are significant at $P = 0.05$		
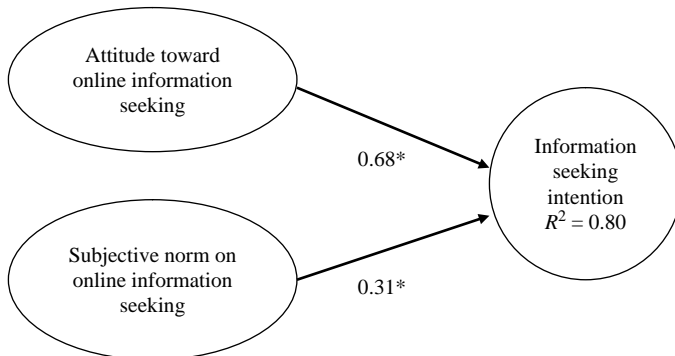
Table I.
Standardized confirmatory factor loadings

Notes: R^2 show the proportion of the variations of the variable that can be
explained by its causing components; $*P < 0.001$

Figure 5.
Path coefficients
of the TRA
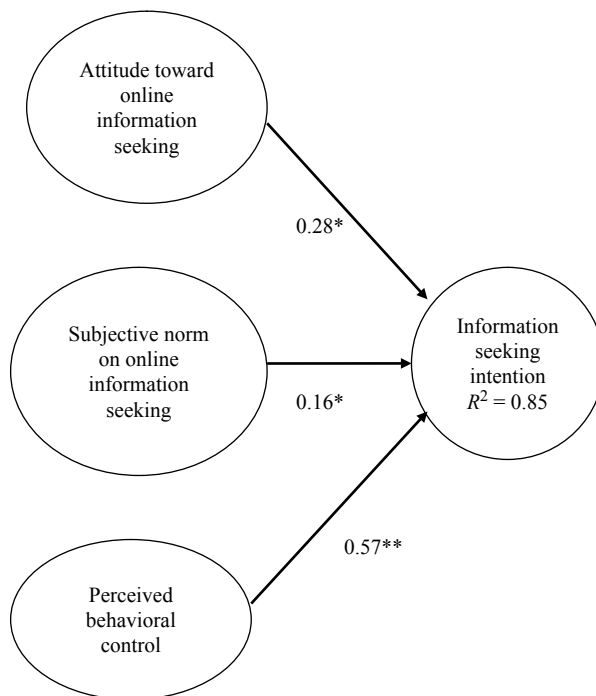
Notes: R^2 show the proportion of the variations of the variable that
can be explained by its causing components; $*P < 0.05$; $**P < 0.001$

Figure 6.
Path coefficients
of the TPB model

by examining the chi-square statistic, which were significant, χ^2 (41) $= 57.54$,
$P < 0.05$ and χ^2 (71) $= 93.71$, $P < 0.05$. As this statistic is sensitive to sample size
(Bagozzi and Yi, 1988), additional measures of fit were tested. Table II contains the
six indices used to evaluate the fit of the models: the χ^2 test (Bentler, 1995),

standardized root mean square residual (RMR; Jöreskog and Sörbom, 1993), root mean square error of approximation (RMSEA; Browne and Cudeck, 1993), goodness-of-fit index (GFI; Jöreskog and Sörbom, 1996), comparative fit index (CFI; Bentler, 1988), and normed fit index (NFI; Bentler and Bonett, 1980).

Figure 5 and Figure 6 show the estimated path coefficients for the models. Given the overall adequate fit of the models, an examination of the hypotheses tests was considered appropriate. These results also indicate that Model 2 ($R^2 = 0.85$) predicts the information-seeking intention better than Model 1 ($R^2 = 0.80$), so H1 was supported. The χ^2 scores are not satisfactory for each model according to Jöreskog and Sörbom (1989) described that the follows sample size to easily gain the significant result (Hoyle, 1995). The χ^2 statistic wasn't adequate to judge whether the model is a good fit, but the scores of RMR (less than 0.05), RMSEA (less than 0.08), GFI (more than 0.9), NFI (more than 0.9) and CFI (more than 0.95) were satisfactory for Model 1 and Model 2. For each model, all the path coefficients were significant at a 5 percent significance level, so H2, H3, and H4 were supported. In Model 1, the results of the TRA dimensions showed that attitude toward information-seeking and the subjective norm had direct effects on the information-seeking intention ($\beta = 0.68$, $P < 0.001$; $\beta = 0.31$, $P < 0.001$), whereas, in Model 2, the results of the TPB dimensions show that attitude toward information-seeking and subjective norm lessen the same relationships ($\beta = 0.28$, $P < 0.05$; $\beta = 0.16$, $P < 0.05$). However, in Model 2, perceived behavioral control was a more important determinant for the information-seeking intention ($\beta = 0.57$, $P < 0.01$) than were attitude toward information-seeking or subjective norm. Overall, the empirical findings support the idea that models based on the TPB predict the information-seeking intention better than those based on the TRA. The modification indices did not propose any significant modifications of either the measurement or the structural model.

5. Implications

This study empirically examines what important attributes are brought to a user's information-seeking intention. Our findings can be summarized as follows.

First, the TPB (Ajzen, 1985, 1991) explains the information-seeking intention better than the TRA (Fishben and Ajzen, 1975). Although attitude toward information-seeking and the subjective norm play important roles in determining the information-seeking intention, perceived behavioral control was found to be a powerful determinant. This result is inconsistent with Kang *et al.* (2006), who suggested that perceived behavioral control added some explanatory power in predicting behavioral intention.

	Model 1	Model 2
χ^2	57.54	93.71
P-value	0.05	0.04
Degrees of freedom	41	71
RMR	0.01	0.01
RMSEA	0.04	0.04
CFI	0.99	0.99
NFI	0.97	0.97
GFI	0.96	0.95
Explained variance in intention	0.80	0.85

Table II.
Structural model results: information seeking intention

Second, the TRA and the TPB effectively explain the information-seeking intention and implies that both attitude toward information-seeking and the subjective norm can influence users' behavior intention. Thus, academic digital libraries should make an effort to ensure users have a positive attitude toward information-seeking and that they understand the advantages of online information-seeking. Librarians may educate users that seeking information via the Internet can reduce the time required for the search. This can help enhance users' positive attitude toward perceiving online information-seeking as a wise use of time, useful, and valuable. In addition, since subjective norms are also influential in explaining the information-seeking intention in an academic digital library, users may seek academic resources in an academic digital library because others (teachers, classmates, friends, etc.) in their social networks use it. While there has been a dramatic increase in the number of academic digital libraries, most are not exploited to their full potential, so librarians can provide diverse services and improve online searching systems to promote usage.

Third, our results imply that positive perceptions of their behavioral control are critical for users to increase their use of academic digital libraries, and for the libraries to become more effective. This finding is consistent with Fortin (2000), who proposed a conceptual model to explain perceived behavioral control as a key determinant for explaining behavioral intention in the online environment. For readers to use academic digital libraries, they will require skills, opportunities, and resources related to finding and seeking specific information on the Internet.

Finally, based on the purpose of users' information-seeking, the intention of information-seeking specific library resources is linked with the process of information problem-solving. Past research has explained the attribute of the process of information problem-solving: ask definition, information-seeking strategies, location and access, use of information, synthesis, and evaluation (Big Six, Eisenberg and Berkowitz, 1990). The role of skill of information-seeking strategies was consistent with our findings. Perhaps, the questions regarding the skill of information-seeking strategies that readers considered most were: "Where will I find the information I need?" and "Make a list of all the possible sources of information that will help me answer the questions I wrote in task definition." That is, librarians should stress that an advanced inspection tool can provide library resources for end-users effectively (Hartson *et al.*, 2004) and design easy-to-use websites to bolster users' perceptions of control. The increasing usage of academic digital libraries is not only good for students and researchers, but it can also enhance librarians' management efficiency.

6. Conclusion

The present study compares the TRA and the TPB's attributes to predict the information-seeking intention, and identifies the important role of perceived behavioral control. However, the study is not without its limitations. First, it depended on self-reported measures, which might inflate the relationships between predictors and intention as a result of common method variance and response bias (Morwitz *et al.*, 1993). Second, there are additional individual and external factors, such as gender differences, that can have direct and indirect effect on the variables (Walker *et al.*, 2006), and that might be discussed in the proposed model. Third, external validity might be questioned regarding the representativeness of the student sample. However, this is not expected to be a serious barrier because student samples are acceptable for

testing causal relationships and theories as long as no attempts are made to infer estimates about population parameters.

Despite the growing importance and popularity of online information-seeking tools, there has been little research on usage of academic digital libraries, so there are many directions that can be taken by future studies. First, future research may extend models that incorporate past user behavior with information-seeking (Norman and Smith, 1995) or look at how users search for specific information. Second, of the information-seeking intention in academic digital libraries discussed above, perceived behavioral control appears to be the most pertinent factor for users. This is consistent with a strong user preference when engaged in information-seeking activities on usability of academic digital libraries, where it was found that most readers felt that online inspection would immediately help them in seeking research information. The choice of an information-seeking medium is concerned with readers' preference, which may be discussed in future works. Third, the usage of online information-seeking in an academic library may change the cost structure and pattern of user search intention. Future studies can also compare the volume of online information-seeking with that of offline information-seeking to understand user trends. Finally, the TRA and TPB concentrated on psychological factors to analysis the information-seeking intention; some extraneous factors such as gender could be used in future research.

References

Ajzen, I. (1985), "From intentions to actions: a theory of planned behavior", in Kuhl, J. and Beckman, J. (Eds), *Action Control: From Cognition to Behavior*, Springer, Heidelberg.

Ajzen, I. (1988), *Attitudes, Personality, and Behavior*, Dorsey Press, Chicago, IL.

Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50, pp. 179-211.

Ajzen, I. and Fishbein, M. (1980), *Understanding Attitudes and Predicting Social Behavior*, Prentice-Hall, Englewood Cliffs, NJ.

Anderson, J.C. and Gerbing, D.W. (1988), "Structural equation modeling in practice: a review and recommended two-step approach", *Psychological Bulletin*, Vol. 103 No. 3, pp. 411-23.

Arbuckle, J.L. and Wothke, W. (1999), *Amos 4.0 User Guide*, Small Waters, Chicago, IL.

Bagozzi, R.P. and Yi, Y. (1988), "On the evaluation of structural equation models", *Journal of the Academy of Marketing Science*, Vol. 16 No. 1, pp. 74-94.

Bagozzi, R.P., Baumgartner, H. and Yi, Y. (1992), "State versus action orientation and the theory of reasoned action: an application to coupon usage", *Journal of Consumer Research*, Vol. 18, pp. 505-18.

Bandura, A. (1986), *Social Foundations of Thought and Action: A Social Cognitive Theory*, Prentice Hall, Englewood Cliffs, NJ.

Bentler, P.M. (1988), "Comparative fit indexes in structural models", *Psychological Bulletin*, Vol. 107, pp. 238-46.

Bentler, P.M. (1995), *EQS Structural Equations Program Manual*, Multivariate Software, Encino, CA.

Bentler, P.M. and Bonett, D.G. (1980), "Significance tests and goodness-of-fit in the analysis of covariance structures", *Psychological Bulletin*, Vol. 88 No. 3, pp. 588-600.

Browne, M.W. and Cudeck, R. (1993), "Alternative ways of assessing model fit", in Bollen, K.A. and Long, J.S. (Eds), *Testing Structural Equation Models*, Sage, Beverly Hills, CA, pp. 136-62.

Cronbach, L.J. (1951), "Coefficients alpha and the internal structure of tests", *Psychometrika*, Vol. 16, pp. 297-334.

Dillon, A. (2000), "Spatial-semantics: how users derive shape from information space", *Journal of the American Society for Information Science*, Vol. 51 No. 6, pp. 521-8.

Eisenberg, M.B. and Berkowitz, R.E. (1990), *Information Problem-Solving: The Big Six Skills Approach to Library & Information Skills*, Ablex Publishing Corporation, Norwood, NJ.

Fishbein, M.A. and Ajzen, I. (1975), *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*, Addison-Wesley, Reading, MA.

Fortin, D.R. (2000), "Clipping coupons in cyberspace: a proposed model of behavior for deal-prone consumers", *Psychology & Marketing*, Vol. 17 No. 6, pp. 515-34.

Hagger, M.S. and Chatzisarantis, N.L.D. (2005), "First- and higher-order models of attitudes, normative influence, and perceived behavioral control in the theory of planned behavior", *British Journal of Social Psychology*, Vol. 44 No. 4, pp. 513-35.

Hansen, T., Jensen, J.M. and Solgaard, H.S. (2004), "Predicting online grocery buying intention: a comparison of the theory of reasoned action and the theory of planned behavior", *International Journal of Information Management*, Vol. 24, pp. 539-50.

Hartson, H.R., Shivakumar, P. and Pérez-Quiñones, M.A. (2004), "Usability inspection of digital libraries: a case study", *International Journal on Digital Libraries*, Vol. 4 No. 2, pp. 108-23.

Hoyle, R.H. (1995), *Structural Equation Modeling: Concepts, Issues and Applications*, Sage, Newbury Park, CA.

Jöreskog, K.G. and Sörbom, D. (1989), *LISREL 7: A Guide to the Program and Applications*, Scientific Software International, Chicago, IL.

Jöreskog, K.G. and Sörbom, D. (1993), *LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language*, Scientific Software International, Lincolnwood, IL.

Jöreskog, K.G. and Sörbom's, D. (1996), *LIREL 8 Users Reference Guide*, SSI, Chicago, IL.

Kang, H., Hahn, M., Fortin, D.R., Hyun, Y.J. and Eom, Y. (2006), "Effects of perceived behavioral control on the consumer usage intention of e-coupons", *Psychology & Marketing*, Vol. 23 No. 10, pp. 841-64.

Klein, L.R. (1998), "Evaluating the potential of interactive media through a new lens: search versus experience goods", *Journal of Business Research*, Vol. 41, pp. 195-203.

Mathieson, K. (1991), "Predicting user intention: comparing the technology acceptance model with the theory of planned behavior", *Information System Research*, Vol. 2, pp. 173-91.

Matusiak, K.K. (2006), "Information seeking behavior in digital image collections: a cognitive approach", *The Journal of Academic Librarianship*, Vol. 32 No. 5, pp. 479-88.

Morwitz, V.G., Johnson, E. and Schmittlein, D. (1993), "Does measuring intent change behavior?", *Journal of Consumer Research*, Vol. 20, pp. 46-61.

Norman, P. and Smith, L. (1995), "The theory of planned behavior and exercise: an investigation into the role of prior behavior, behavioral intention, and attitude variability", *European Journal of Social Psychology*, Vol. 25, pp. 403-15.

Sharma, M. and Kanekar, A. (2007), "Theory of reasoned action & theory of planned behavior in alcohol and education", *Journal of Alcohol and Drug Education*, Vol. 51 No. 1, pp. 3-7.

Shen, X., Zheng, Z., Han, S. and Shen, C. (2008), "A review of the major projects constituting the china academic digital library", *The Electronic Library*, Vol. 26 No. 1, pp. 39-54.

Shim, S., Eastlick, M.A., Lotz, S.L. and Warrington, P. (2001), "An online prepurchase intention model: the role of intention to search", *Journal of Retailing*, Vol. 77, pp. 397-416.

Taylor, S. and Todd, P.A. (1995), "Understanding information technology usage: a test of competing models", *Information System Research*, Vol. 6, pp. 144-76.

Walker, G.J., Courneya, K.S. and Deng, J. (2006), "Ethnicity, gender, and the theory of planned behavior: the case of playing the lottery", *Journal of Leisure Research*, Vol. 38 No. 2, pp. 224-48.

Wang, M.S., Chen, C.C., Chang, S.C. and Yang, Y.H. (2007), "Effects of online shopping attitudes, subjective norm and control beliefs on online shopping intention: a test of the theory of planned behavior", *International Journal of Management*, Vol. 24 No. 2, pp. 296-302.

About the authors
Chiao-Chen Chang is an Assistant Professor of the Department of Business Administration, Tamkang University, Taipei, Taiwan, ROC. She has a PhD from the Department of Management Science, National Chiao Tung University, Hsinchu, Taiwan, Her current research focuses on library & information science, internet marketing, consumer behavior, and electronic commerce. Chiao-Chen Chang is the corresponding author and can be contacted at: aka@mail.tku.edu.tw

Chia-Yen Lin is currently an Assistant Professor at the Department of Information Management, Chia Nan University of Pharmacy & Science, Tainan, Taiwan, ROC. Her current research interest includes information management, internet marketing, consumer behavior, electronic commerce, and technology marketing and strategy.

Yu-Chin Chen is currently an Assistant Professor at the Department of Information Management, Kao Yuan University, Kaohsiung, Taiwan, ROC. His current research interest includes information management, online behavior analysis, system and network management, and electronic commerce.

Yang-Chieh Chin is a PhD graduate student of the Department of Management Science, National Chiao Tung University, Hsinchu, Taiwan, ROC. His current research focuses on library and information science, internet marketing, consumer behavior, and electronic commerce.