1-1-2003

Using the theory of planned behaviour to predict leisure educators' intentions to use instructional technology

Jennifer Y. Mak
Marshall University, mak@marshall.edu

Craig M. Ross

Recommended Citation
Mak, J. Y., & Ross, C. M. (2003). Using the theory of planned behaviour to predict leisure educators' intentions to use instructional technology. Leisure/Loisir, 28(3-4), 307-308.

Using the Theory of Planned Behaviour to Predict Leisure Educators' Intentions to Use Instructional Technology

Jennifer Y. Mak
Marshall University

Craig M. Ross
Indiana University

Abstract. The Theory of Planned Behaviour (TPB) (Ajzen, 1991b) was applied to the prediction and explanation of the intention to use instructional technology by using a mail questionnaire (n = 406) of leisure educators in the United States and Canada. Based on structural equation modeling, it was found that the key determinants of the TPB, attitude toward instructional technology, subjective norm toward instructional technology, and perceived behavioural control toward instructional technology accounted for 50% of the leisure educators' intention to use instructional technology. The strongest predictor of intention was attitude toward instructional technology, followed by subjective norm toward instructional technology and perceived behavioural control toward instructional technology. The findings provide insight into faculty members' intention to develop and use instructional technology.

In recent years, there has been a significant increase in the development and use of instructional technology in higher education (Campus Computing Report, 2001). Computers have been more accessible to faculty than ever before, and computer capabilities have increased dramatically (Breithaupt, 1997). The technology available today has extended the content of teaching from simply typing and distributing the course syllabus to enriching classroom discussions, promoting class participations, and enhancing student learning opportunities and experiences. However, respondents to the Campus Computing Project (2001), the largest continuing study of the role of information technology in American higher education, identified assisting faculty integration of technology into the classroom as the single most important instructional technology issue confronting faculty and administrators over the next few years.

In 1990 and 1993, the National Recreation and Park Association (NRPA) and the American Association for Leisure and Recreation (AALR) recognized the importance of technology and mandated in its curriculum standards that computer literacy be included in the accreditation requirement of undergraduate programs (Williams, 1994). With this in mind, the majority of the publications that have studied instructional technology in leisure education were focused on the integration of technology into the curricula (Austin & Gruver, 1992; McLean & Hill, 1993; Mihalik, 1989), the benefits and drawbacks of using instructional technology (Fox, 1996; Hill, 1996; Love, 1996), and the impact of instructional technology on students (Austin & Gruver, 1992; Austin, Perry, Harnishfeger, & McCormick, 1998; Vogt, Hase, Reyonolds, & Virden, 1996). Studies related specifically to the impact of instructional technology on leisure educators are scarce. Therefore, the need to determine factors that influence a faculty member's choice to effectively implement and use instructional technology in teaching is essential.

The Theory of Planned Behaviour (TPB) forms the foundation of a conceptual framework to investigate the leisure educators' intention of adopting instructional technology. Thus, this paper aims to examine

various aspects of this theory in the context of faculty members' intention to use instructional technology.

Theory of Planned Behaviour

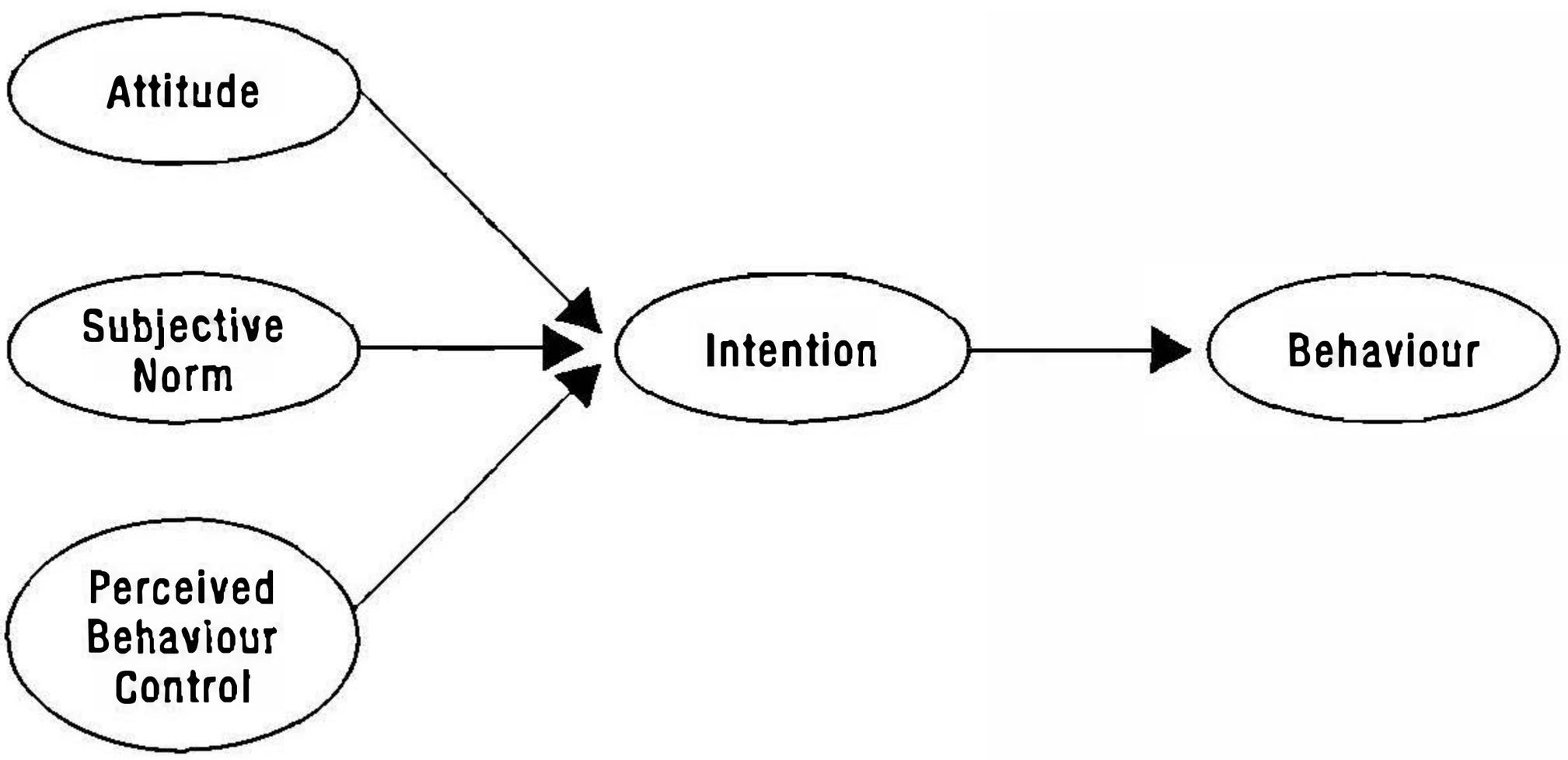
According to Bandura (1982, 1994), the aim of a comprehensive theory of behaviour was to provide a framework that could address diverse variables that influenced behaviour. The Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) and the TPB (Ajzen, 1985, 1988, 1991a, and 1991b; Ajzen & Madden, 1986; Madden, Ellen, & Ajzen, 1992) provide a basis for investigating interrelationships among attitude, subjective norm, perceived behavioural control, and behavioural consistency issues. The TPB is an extended form of the TRA. The TRA assumes human beings usually behave in a sensible manner. People take account of available information and implicitly or explicitly consider the implications of their actions (Ajzen, 1988). The TRA suggests that the proximal determinant of volitional behaviour is one's intention to engage in that behaviour. Intention is a function of two basic determinants. The first determinant is termed attitude toward the behaviour. Unlike general attitudes toward institutions, people, or objects that have traditionally been studied by social psychologists, this "attitude toward the behaviour" is the individual's positive or negative evaluation of performing a particular behaviour of interest. The second determinant of intention is the person's perception of social pressure to perform or not to perform the behaviour under consideration. This factor is termed subjective norm. Fishbein and Ajzen (1993) identified more than 250 empirical investigations based on these two theories. Moreover, meta-analytic reviews of the TPB have provided strong support for the predictive validity in terms of the percentage of variance explained in behaviour (between 19% and 38%) and intention (between 40% and 50%) by the components of the TPB (Armitage & Conner, 2001; Godin & Kok, 1996; Sutton, 1998).

In suggesting that behaviour is solely under the control of intention, the TRA restricts itself to volitional behaviours. Therefore, behaviours requiring skills, resources, or opportunities have not been considered to be within the domain of applications of the TRA (Fishbein, 1993). As an extended form of the TRA, the TPB attempts to predict non-volitional behaviours by adding the concept of perceived behavioural control in order to increase the theory's predictive value for behaviour that is not solely under one's control (Ajzen, 1985; Ajzen & Madden, 1986; Madden et al., 1992). The concept of perceived behavioural control states that

there is a set of beliefs related to the presence or absence of requisite resources and opportunities (Ajzen & Driver, 1992). These control beliefs might be based partly on past experiences and/or the second hand information about the behaviour. These include the experiences of acquaintances, the experiences of friends, and other factors that increase or decrease the perceived difficulty of performing the behaviour. Individuals' perceived control over the behaviour would be increased, if the more resources and opportunities individuals believed they possessed, and/or the fewer obstacles or impediments they anticipated.

Briefly, the TPB (Ajzen, 1985, and 1988) has three main conceptual independent determinants of intention (see Figure 1). The first predictor is the attitude toward the behaviour that refers to the degree to which the person has a favorable or unfavorable evaluation of the behaviour (Ajzen, 1991a). The second predictor is a social factor that is termed subjective norm, which refers to the perceived social pressure to perform or not to perform the behaviour (Ajzen, 1991a). The third predictor is the degree of perceived behavioural control which refers to the perceived ease of performing or perceived difficulty of performing the behaviour (Ajzen, 1985).

Figure 1



Note. Adopted from Ajzen, I. (1988). *Attitudes, personality and behaviour*. Milton Keynes, UK: Open University Press.

The TPB has also been extensively used in the park and recreation field. Hrubes, Ajzen, and Daigle (2001) used it to predict the hunting intentions and behaviours of outdoor recreationists. Ajzen and Driver (1991, 1992)

used it to predict leisure participations and leisure choices. The results of these studies support hunting intentions; leisure participations and leisure choices were strongly influenced by attitude, subjective norm and perceived behavioural control.

Attitude of Faculty toward Instructional Technology

The "attitude toward the behaviour" refers to a positive or negative evaluation in performing a behaviour (Ajzen, 1988). Similarly, a faculty's view of the probable outcome or consequences of their teaching behaviour by using or not using instructional technology can be segmented into two components: (a) evaluation of whether the outcome is likely to be good or bad, and (b) predictability of the occurrences (Ajzen & Madden, 1986). There have been several studies, as well as panel discussions, conducted on faculty attitude toward instructional technology. Bullard (1998) found most faculty members tended to agree that computers improved teaching efficiency. Instructional technology not only improved teaching effectiveness but also increased student motivation to learn (Al-Laqani, 1991; Baker, Hale, & Gifford, 1997; Barron & Orwig, 1993; Burnaska, 1998). Barron and Orwig (1993) viewed technology as facilitating a multi-sensory delivery method and increased students' motivation. Al-Laqani (1991) suggested that technology-based instruction increased attention and interest in a subject. In 1998, Burnaska reported that the use of instructional technology raised students' intrinsic motivation and self-efficacy to learn. In comparison with the traditional classroom, well-designed computer-mediated instruction raised students' scores, decreased learning time, and enhanced students' attitudes toward learning (Baker, Hale, & Gifford, 1997).

Negative views about technology have also been widely reported. Faculty members have considered technology as generally inflexible and inadaptable. Studies conducted by Wright (1998) and Young (1997) reported that faculty members were concerned about the reliability associated with instructional technology. Faculty indicated that the use of instructional technology would reduce teacher-student interaction and thus weaken their relationship with students (Young, 1997). Instructional technology-based teaching changed the classroom from teacher-centered to student-centered (Grabinger & Duffield, 1996; Peck & Dorricott, 1994). Faculty believed these shifts would be threatening because it appeared that they had less control over the teaching and lost their authority in the technological environment (Norum, Grabinger, & Duffield, 1999). Moreover, as teachers were asked to take on different

roles such as technical experts and webmasters, the professional identity of a teacher was being altered (Norum & Lowry, 1995). In an extreme case, faculty believed that technology threatened their jobs as the technology-based classroom might eliminate the need for their positions (Young, 1997). Lastly, faculty members perceived technology-based instruction as a lack of contribution to professional advancement such as promotion, tenure, retention, or pay raise, especially when teaching generally played a secondary role to research and publications as the way to receive promotions, pay increase, or tenure (Thompson, 1986). Faculty members perceived innovation of instructional technology were time consuming and they prefered to devote the time for research and scholarship.

Subjective Norm toward Instructional Technology

Subjective norm refers to the perceived social pressure to perform or not to perform the behaviour (Ajzen & Fishbein, 1980). In a social system, the referent can be a set of individuals, groups, or organizations (Rogers, 1995). This system defines the boundaries within which the diffusion occurs. Faculty, administrators, staff, students, and all of the expectations of our culture within the higher education system may potentially influence a faculty member's decision on adopting instructional technology (Spotts, 1998).

When it comes to integrating technology into the classroom, researchers such as Levine (1995), Norum and his collegues, (1999), and Polin (1992) found that teachers needed support from administrators, parents, and the public. In their studies having role models/mentors within the department, along with the support of higher administrators such as the dean and chairperson, were considered factors affecting the use of instructional technology. Moreover, colleagues within the same institution or field and peers or friends were also considered as the individuals who could influence the decision of faculty to adopt the instructional technology (Heath, 1996; Spotts, 1998).

Perceived Behavioural Control toward Instructional Technology

Perceived behavioural control refers to the ease or difficulty that an individual faces performing a given behaviour. It is influenced by the individual's past experiences and external factors such as anticipated impediment, obstacles, resources, as well as opportunities that may influence the performance of the behaviour (Ajzen, 1991a). Resistance to adopt instructional technology had been attributed to many factors

(Cuban, 1993; Office of Technology Assessment (OTA), 1995). Several studies supported the idea that lack of time is an important obstacle for the adoption of instructional technology. Mu (1997) reported faculty members cited lack of time as the number one barrier which prevented them from using instructional technology. Hoffman (1996) estimated that teachers needed five to six years of staff development to become proficient in instructional technology.

Studies also showed that lack of skills, knowledge, and information were also important factors which hinder the adoption of instructional technology (Dusick, 1998; Hannah & Abate, 1993; Hoffman, 1996; OTA, 1995; Roberts & Ferris, 1994; Sammoms, 1994; Spotts & Bowman, 1995). In addition, lack of training opportunities and staff development were also cited as significant obstacles in the adoption of instructional technology (Chin & Hortin, 1993; OTA, 1995; Mu, 1997; Palazzo, 1995; Spotts & Bowman, 1995). Another important obstacle was lack of available facilities and equipment (Becker, 1994; Cuban, 1993; Dusick, 1998; Heath, 1996; Mu, 1997; OTA, 1995; Spotts & Bowman, 1995). Lack of technical support, administrative support, and financial support were also critical factors in the adoption of instructional technology (Becker, 1994; Cuban, 1993; Dusick, 1998; Hannah & Abate, 1993; Heath, 1996; Hoffman, 1996; OTA, 1995; Palazzo, 1995; Spotts & Bowman, 1995).

Methodology

The initial population for this study consisted of 1,188 leisure educators in the United States (n = 1,129) and Canada (n = 59). The faculty member list was generated from the 1998-1999 Society of Park and Recreation Educators (SPRE) curriculum catalog.

Development of the questionnaire involved (a) a study of related literature, (b) review by an expert panel, (c) usability tests, and (d) a pilot test. The initial questionnaire contained three parts: Part I of the survey instrument consisted of fifteen questions related to applications of computer-based technology. Part II of the survey instrument consisted of 41 questions based on the related literature and the constructs of TPB. It was designed and scaled to elicit responses on the four main constructs of the TPB: attitude toward instructional technology, subjective norm toward instructional technology, perceived behavioural control toward instructional technology, and intention to use instructional technology. Each construct was based on a six-point Likert-type scale with the following options: "6"—strongly agree; "5"—agree; "4"—slightly agree; "3"—slightly disagree; "2"—disagree; "1"—strongly disagree and "9" not

applicable or don't know. It was a conscious decision by the researchers not to provide a "neutral" choice so as to elicit some level of attitudes and beliefs held by the respondents. Part III of the survey instrument consisted of the background information and demographic characteristics of the faculty members: academic rank, gender, highest academic degree earned and date received, specialty areas, teaching duty, teaching expe-rience, tenure status, total student enrolment in the program/department, and total student enrolment on campus. This questionnaire was reviewed for content validity by a panel of seven experts, consisting of four park and recreation professors, an instructional technology professor, an instructional technology specialist, and a survey development specialist. Minor changes were made to the wording of several questions.

Following the confirmation of content validity of the questionnaire, usability tests were conducted to determine whether the items were defined similarly and the vocabulary level was appropriate. Four faculty members, teaching in different university leisure education curricula, were invited to participate in the usability tests. Faculty members were asked to read the instrument aloud and inform the researcher what they believed each question item meant. Using results from the usability tests, the updated questionnaire was pilot-tested using a random sample of faculty members from the initial sample population. The pilot study was completed to assess the internal reliability of each of the four constructs in Part II by using the Cronbach Coefficient Alpha reliability coefficient. The pilot instrument was tested on 29 leisure educators. After considering the results of the Cronbach Alpha Coefficient, the decision was made to eliminate the item "Computer Based Technology (CBT) will change the way I teach." This action improved Alpha from 0.75 to 0.82. The results of the Cronbach Alpha analyses indicated that the instrument was internally consistent and reliable. Because no estimate of construct validity was provided for this instrument, an additional goal of the current study was to test the questionnaire constructs with the study sample by using confirmatory factor analysis and structural equation modeling. Structural equation modeling represents an extension of the collection of statistics belonging to the General Linear Model. It is a powerful statistical technique that combines the measurement model (confirmatory factor analysis) and the structural model (regression or path analysis) into a simultaneous statistical test.

Upon completion of the pilot study, 1,104 questionnaires were distributed in the spring of 2000 to the leisure educators. The Salant and Dillman (1994) survey methodology procedure was implemented for data

collection. First, a personalized, advance-notice letter was sent to the faculty members in mid-April. About one week later, another personalized cover letter, a questionnaire and a business-reply return envelope were mailed to faculty members. Eight days after these mailings, follow-up postcards were sent to the faculty. The follow-up postcards thanked those who had responded and requested a response from those who had not yet responded. Three weeks after the first questionnaire was mailed, another personalized cover letter, questionnaire and business-reply return envelope were sent to those who had not responded. Of the 1,104 questionnaires, 132 were returned for the following reasons: undeliverable, non-leisure educators, retired, or deceased. As a result, the final sample size was 972. The entire procedure yielded a total of 406 (42%) valid and usable questionnaires.

The data were analyzed using four statistical techniques. An analysis of frequency distribution was used to describe the demographic information of the respondents. The Cronbach Coefficient Alpha test was used to establish reliability and internal consistency for the questionnaire. Confirmatory factor analysis and structural equation modeling analysis was used to determine if a relationship existed between the intention to use instructional technology and the three main components of the theory of planned behaviour: attitude toward instructional technology, subjective norm toward instructional technology, and perceived behavioural control toward instructional technology. Bollen and Long's (1993) five-step procedure (model specification, identification, estimation, testing fit, and re-specification) was followed in the structural equation modeling analysis. The assessment of model fit was based on the goodness-of-fit index (GFI >.90), adjusted GFI, (AGFI >.90), standardized RMR (standardized RMR < .05), root-mean-square error of approximation (RMSEA < .05) and χ^2/df ratio (χ^2/df < 2.00).

Results

Demographic

Over 60% of the faculty members were male. Professors and associate professors formed the two largest portions of the respondents (67%). Assistant professors comprised 16% and the instructors/lecturers comprised 13% of the respondents. Most of the faculty members were tenured (66%), 14% of the faculty members were pre-tenured and 20% of faculty members were not in the tenure track. The majority of the faculty members (77%) had earned a doctoral degree. Forty percent of the faculty members earned their terminal degree in the 1980s and 30% in

the 1990s. The primary job responsibility of 65% of the faculty members was teaching and 80% of the faculty members had more than 10 year's of teaching experience. Park and recreation administration, outdoor/ resources management, and therapeutic recreation were the three most dominant specialty areas, and each accounted for more than 20% of the respondents. Nearly ten percent of the faculty members taught on small campuses (those with student enrolment of less than 4,999), while 17% were from large campuses (those with more than 35,000 students). In terms of majors in a department, 4% of the faculty members worked in small programs with as few as 39 majors, while 18% of faculty worked in large programs of more than 320 majors. Finally, more than 70% of the faculty members regarded themselves as skilled users of computer-based technology.

Estimation, Tests, and Modification of Theory of Planned Behaviour Model

The proposed model (see Figure 2) represents the theory of planned behaviour for the use of instructional technology. Estimation, tests, and modification of the model in LISREL were based upon the covariance matrix of the remaining 21 observed variables after four confirmatory factor analyses of each latest variable (attitude toward instructional technology, subjective norm toward instructional technology, perceived behavioural control toward instructional technology, and intention to use instructional technology). The descriptive information of the 21 observed variables is presented in Table 1. The means of the 21 observed variables ranged from 2.36 to 5.05. The standard deviations of the 21 observed variables ranged from .84 to 1.48.

The overall fit of the proposed model appeared to be poor (see Table 2), as only two of the goodness-of-fit indices, GFI and CFI, reached the cut-off point of .90. Moreover, the RMSEA value was .060, which was higher than the tolerable value .050. The χ^2/df ratio was 2.48, which was higher than the 2.00 limit. The standardized RMR was .06, which was higher than the desired value .05 (see Table 2). Therefore, the proposed model was rejected. According to Jöreskog and Sörbom (1996), the improvement in fit is measured by a reduction in χ^2, which is expected to equal the modification index. After considering the results of the modification index, the first decision was made to eliminate PBC12 (i.e., It is easy for me to set aside time to work on CBT). This action reduced χ^2 from 453.71 to 367.40, which was the largest reduction of χ^2. By eliminating PBC12, the standardized RMR was .05, which was the desired value .05. However, the RMSEA value was .055, which was

Figure 2
Theory of Planned Behaviour: Proposed Model

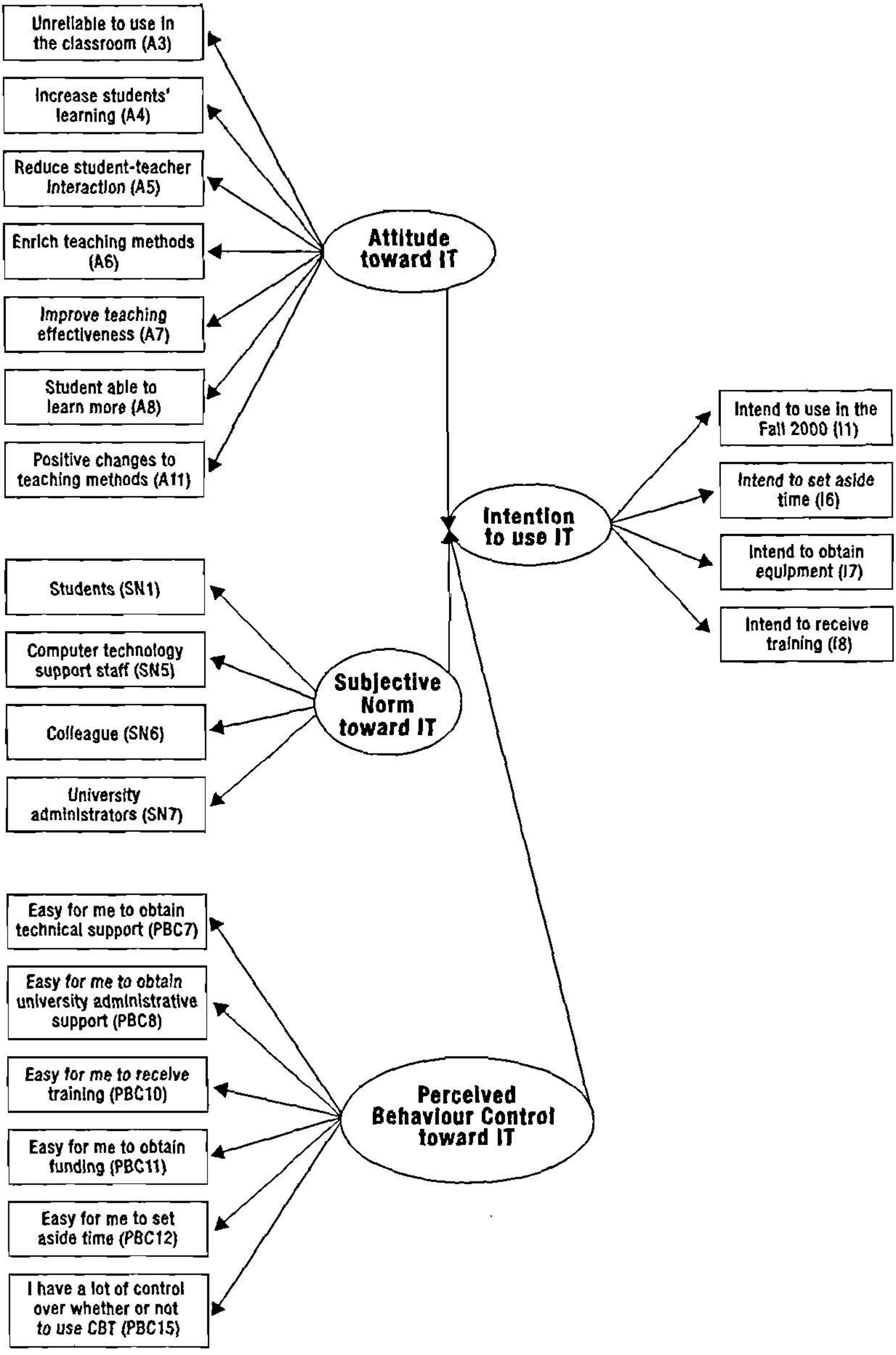


Table 1
Descriptive Information of 21 Observed Variables

	Varibles Code	Mean[b]	SD
Attitude toward Instructional Technology			
CBT[a] are unreliable to use in the classroom	A3	1.79	1.30
CBT increase students' learning	A4	4.45	1.15
CBT reduce student and teacher interaction	A5	2.46	1.48
CBT enrich teaching methods	A6	4.83	0.84
By using CBT, I will improve my teaching effectiveness	A7	4.49	1.10
By using CBT, my students will be able to learn more	A8	4.27	1.12
CBT will cause positive changes to my teaching methods	A11	4.46	1.06
Subjective Norm toward Instructional Technology			
Regularly, my students suggest CBT applications for the classroom	SN1	2.36	1.17
I would like to adopt the computer technology support staff's suggestions to use CBT	SN5	4.16	1.14
I would like to adopt my colleague's suggestions to use CBT	SN6	4.31	1.11
I would like to adopt the university administrator's suggestions to use CBT	SN7	3.91	1.25
Perceived Behavioral Control toward Instructional Technology			
It is easy for me to obtain technical support	PBC7	3.92	1.40
It is easy for me to obtain university administrative support for CBT	PBC8	3.80	1.39
It is easy for me to receive CBT training	PBC10	4.07	1.33
It is easy for me to obtain funding for CBT	PBC11	3.00	1.31
It is easy for me to set aside time to work on CBT	PBC12	2.39	1.29
I have a lot of control over whether or not to use CBT	PBC15	5.05	1.17
Intention to use Instructional Technology			
I intend to use CBT in the coming academic year	I1	4.65	1.41
I intend to set aside time to work on CBT	I6	4.13	1.25
I intend to obtain appropriate equipment and facilities for CBT	I7	4.00	1.30
I intend to receive CBT training	I8	4.31	1.19

a CBT refers to Computer Based Technologies.

b Mean scores were based on a six point Likert scale with the following options: "6"—strongly agree; "5"—agree; "4"—slightly agree; "3"—slightly disagree; "2"—disagree; and "1"—strongly disagree.

Table 2
Theory of Planned Behaviour: Model Analysis

Index	Proposed Model Initial Analysis	2nd Analysis	3rd Analysis	4th Analysis	Alternative Model Final Analysis
RMSEA	.060	.055	.053	.05	.047
χ^2	453.71	367.40	311.18	259.39	215.22
df	183.00	164.00	146.00	129.00	113.00
χ^2/df	2.48	2.24	2.13	2.01	1.90
P	.00	.00	.00	.00	.00
GFI	.90	.92	.93	.93	.94
AGFI	.88	.89	.90	.91	.92
CFI	.93	.95	.95	.96	.96
RMR	.10	.09	.09	.08	.08
Standardized					
RMR	.06	.05	.05	.05	.05
ECVI	1.36	1.13	.99	.85	.73

Note. RMSEA = root mean square error of approximation (major fit criteria in this study); FGI = goodnes-of-fit index; AGFI = adjusted goodnes-of-fit index; CFI = comparative fit index; RMR = root-mean-square residual; ECVI = expected cross validation index. For instance, Analysis 2 used the original model with PBC12 dropped. Analysis 3 used the variables in Analysis 2 and further dropped SN7. Analysis 4 used the variables in Analysis 3 and further dropped PBC11. Analysis 4 used the variables in Analysis 3 and further dropped I8. The final analysis used the original model with PBC12, SN7, PBC11 and I8 dropped.

higher than the tolerable value .050. The χ^2/df ratio was 2.24, which was higher than the 2.00 limit (see Table 2). Therefore, three further analyses were performed. In addition to PBC12, SN7 (i.e., I would like to adopt the university administrator's suggestions to use CBT), PBC11 (i.e., It is easy for me to obtain funding for CBT) and I8 (i.e., I intend to receive CBT training) were deleted from the proposed TPB model to form the alternative TPB model. The components and the overall fit of the alternative model are listed in Table 2. The alternative model attained satisfactory goodness-of-fit statistics. None of the three indices, GFI, AGFI, or CFI, was estimated below the cut-off point of .90. The RMSEA value in the TPB model was .047, which was below the tolerable value of .050, and the upper confidence limit was below the value .08 suggested by Browne and Cudeck (1993). The χ^2/df was 1.90 which was less than 2.00 limit.

One-sample expected cross validation index (ECVI) was calculated to evaluate the representative of the model in the population. ECVI is a

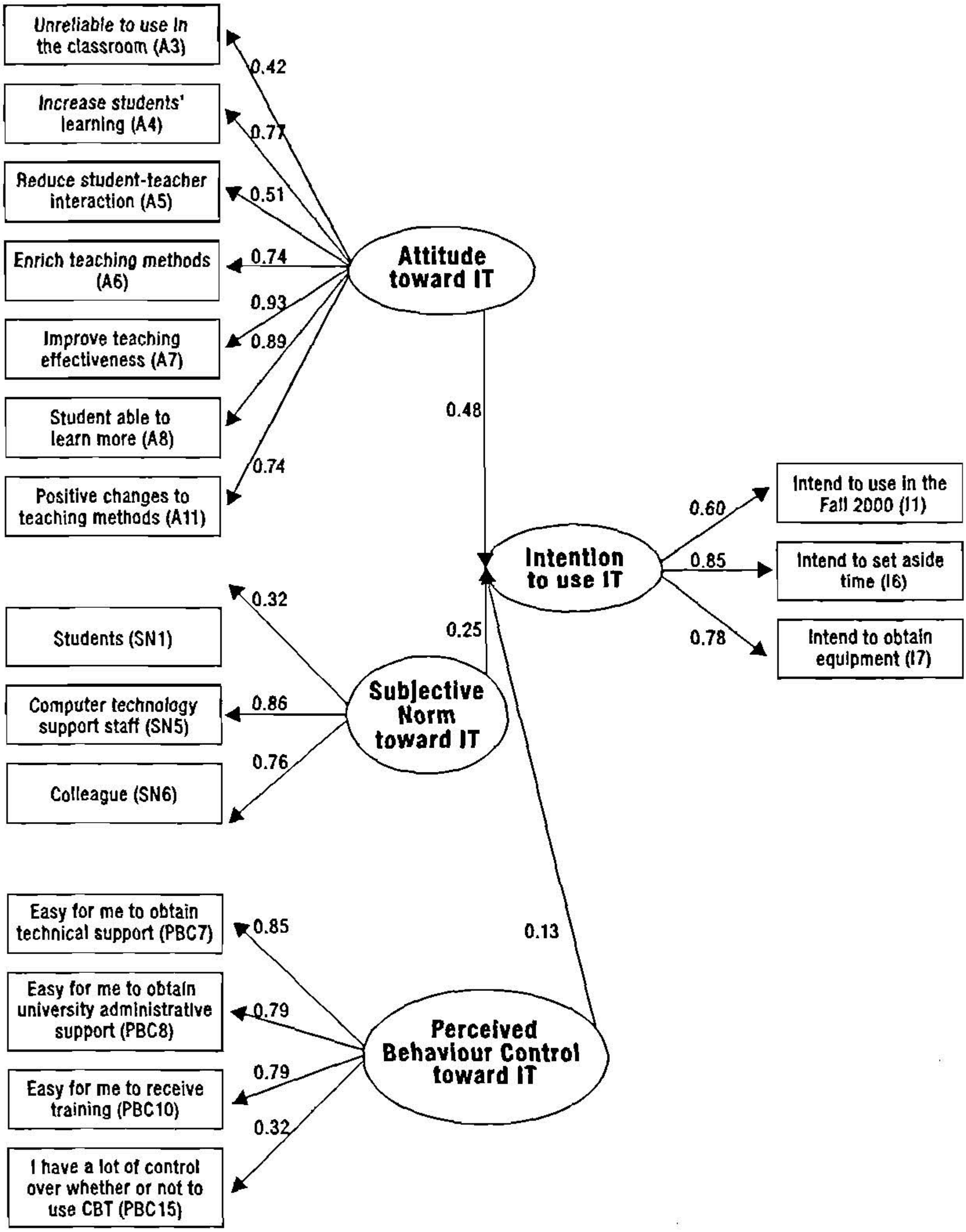
function of chi-square and degree of freedom. Research indicated that the one-sample ECVI yielded highly similar results to those of the two-sample approach (Benson & Bandalos, 1992; Benson & El-Zahhar, 1994; Benson, et al., 1992). The ECVI for the model (.73) was less than the ECVI for the saturated model (.76). In fact, the confidence interval for ECVI was from .64 to .84. These indices were all indicative of an adequate fit of the model, which represented a reasonably close approximation in the population.

The factor loadings of the indicators reveal a high degree of validity, except for the first indicator of subjective norm toward instructional technology (.32) (i.e., regularly, my students suggest CBT applications for the classroom), and the fourth indicator of perceived behavioural control toward instructional technology (.32) (i.e., I have a lot of control over whether or not to use CBT) (see Figure 3). The standardized structural coefficients are in Figure 3. The strongest predictor of intention to use instructional technology was attitude toward instructional technology (.48), and followed by subjective norm toward instructional technology (.25) and perceived behavioural control toward instructional technology (.13). In combination, the three predictors accounted for 50% of the variance of intention to use instructional technology. These results supported that the TPB can be directly applied in predicting the intention to use instructional technology.

Discussion

According to Bandura (1982, 1994), the aim of a comprehensive theory of behaviour is to provide a framework that can address diverse variables that influence behaviour. The results of the structural equation modeling analysis of this study are encouraging. The three main predictors of TPB are found to be accurate predictors of a faculty's intention to use instructional technology. Attitude toward instructional technology, subjective norm toward instructional technology, and perceived behavioural control toward instructional technology account for 50% of the variance of a faculty's intention to use instructional technology. Findings of the study provide support for the predictive validity of the TPB (Godin & Kok, 1996; Sutton, 1998). The factor loadings of the indicators are sufficient to support the conclusion that these predictors possess an adequate degree of validity. The results support the conclusion that attitude toward instructional technology is the strongest predictor, followed by subjective norm toward instructional technology and perceived behavioural control toward instructional technology.

Figure 3
Theory of Planned Behaviour: Alternative Model



Regarding the factor loadings of attitude toward instructional technology (i.e., positive or negative evaluation in performing behaviour), increasing student learning and improving teaching are the two key influencing items. Whether faculty members plan to use instructional technology or not, their decisions are mainly based on their attitude toward instructional technology. This study concludes that faculty mem-

bers believe the use of instructional technology would increase students' learning and improve teaching. These findings are supported by the results of similar studies (Al-Laqani, 1991; Armstrong, 1996; Bullard, 1998; Hiatt, 1998; Spotts & Bowman, 1995; Wellburn, 1996). On the other hand, some studies (Fox, 1996; Young, 1997) suggested that the use of instructional technology would reduce teacher-student interaction. However, this is not the case in this study. Faculty members in this study believed teacher-student interaction would not be reduced through the use of instructional technology.

The second predictor of intention to use instructional technology is subjective norm toward instructional technology (i.e., the social pressure of the others). Students, computer technology support staff, and colleagues were the key persons to influence faculty members' intention to use instructional technology. Many students now expect college professors to incorporate various instructional technologies into their courses since they have been exposed to instructional technology when they were in high schools. People may have a perception that college professors are being pressured by the students to use instructional technology (Jensen, 1998). However, this is not the case in this study. Students were less influential than computer technology staff and colleagues in the decision process of the faculty members to use instructional technology.

The final predictor of intention to use instructional technology is perceived behaviour control toward instructional technology (i.e., difficulty in performing a behaviour). The overall control of instructional technology by the faculty was less influential than technical support, administrative support, and training opportunities in determining perceived behavioural control toward instructional technology.

Future Research

To enhance the integration of instructional technology in leisure education and stay abreast with the rapid changes in instructional technology, the following are areas for further research:

1. To improve the predictive validity of the model, further research should examine other factors that might account for the 50% unexplained variance. Variables such as tenure status, age of faculty, students-to-faculty ratio, past experiences of instructional technology and leisure educators' computer competence could be studied as external factors for the current model.
2. The majority of the participants in the current study are senior faculty members. Further studies should recruit a larger group of young faculty members to participate.

3. Further studies should investigate the actual use of instructional technology besides the intention to use instructional technology.
4. In order to increase the generalization of the model, further research should be replicated by surveying faculty members in other disciplines.
5. Since faculty members have believed the use of instructional technology would increase student learning and improve teaching, further research should be conducted to investigate the students' learning outcomes between the adoption of instructional technology teaching and the traditional classroom teaching.
6. Training opportunities, technical support and administrative support are influential factors for faculty adopting various instructional technologies. To facilitate the integration of technology in leisure education curriculum, further studies should be conducted to identify specific faculty instructional technology needs.

Conclusion

Instructional technology has become a fundamental to teaching. The issues of instructional technology integration and user support will continue to be key challenges facing higher education. The TPB constructs of attitude, subjective norm, and perceived behavioural control are very useful in predicting and explaining leisure educators' intention to use instructional technology. The knowledge gained from this and similar studies could help both professors and administrators understand the key factors associated with incorporating instructional technology into the curricula. Obviously, focusing on understanding faculty members' beliefs and attitudes towards instructional technology can help facilitate the integration of technology into the classroom and possibly improve teaching effectiveness and student learning.

Beyond demonstrating the effectiveness of the TPB, our findings may be implemented in both professional practice situations and research settings. University administrators should begin to develop strategic plans for enhancing and supporting instructional technology. Deans and department chairs should work with their faculty to develop specific goals and objectives to integrate instructional technology into the leisure education curriculum. Support teams that are comprised of instructional and technical support staff, consultants, designers, developers and faculty mentors should be established. These teams can provide technical support, training and consultation on using technology for teaching, based on faculty members' needs or requests.

References

Ajzen, I. (1985). From intentions to action: A theory of planned behaviour. In J. Juhl, & J. Beckman. (Eds.), *Action control: From cognitions to behaviours* (pp. 11-39). New York: Springer.

Ajzen, I. (1988). *Attitudes, personality and behaviour.* Milton Keynes, U.K.: Open University Press.

Ajzen, I. (1991a). Benefits of leisure: A social psychological perspective. In B.L. Driver, P.J. Brown, & G.L. Peterson, (Eds.), *Benefits of leisure* (pp. 411-417). State College, PA: Venture.

Ajzen, I. (1991b). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes, 50,* 179-211.

Ajzen, I. (1996). The social psychology of decision making. In E.T. Higgins & A.W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 297-325). New York, London: Guilford Press.

Ajzen, I., & Driver, B.L. (1991). Prediction of leisure participation from behavioural, normative, and control beliefs: An application of the theory of planned behaviour. *Leisure Science, 13,* 185-204.

Ajzen, I., & Driver, B.L. (1992). Application of the theory of planned behaviour to leisure choice. *Journal of Leisure Research, 24*(3), 207-224.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour.* Englewood Cliffs, NJ: Prentice-Hall.

Ajzen, I., & Madden, T.J. (1986). Prediction of goal directed behaviour: Attitudes, intentions and perceived behavioural control. *Journal of Experimental Social Psychology, 22,* 453-474.

Al-Laqani, A. (1991). *The educational media and the school curriculum.* Cairo: Book Publishing Center.

Armitage, C.J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology, 40,* 471-499.

Armstrong, G. (1996). One approach to motivating faculty to use multimedia. *T.H.E. Journal, 23*(10), 69-71.

Austin, D.R., & Gruver, B.M. (1992). The perceived importance topics of instructional resources development in therapeutic recreation curricula. *Therapeutic Recreation Journal, 26*(1), 48-52.

Austin, D., Perry, A., Harnishfeger, M., & McCormick, B. (1998). Graduate student perceptions of televised master's degree program. *Schole: A Journal of Leisure Studies and Recreation Education, 14,* 123-133.

Baker, W., Hale, T., & Gifford, B. (1997). *Technology in the classroom-From theory to practice,* [Internet]. Educom Review. Retrieved August 8, 2000 from <http://www.academic.com/research/mllibrary/educom(underbar)mag.asp>.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37,* 122-147.

Bandura, A.C. (1994). Social cognitive theory and exercise of control over HIV infection. In R.J. DiClemente, & J.L. Peterson's (Eds.), *Preventing AIDS: Theories and methods of behavioural intervention.* (pp. 25-59). New York: Plenum Press.

Barron, A.E., & Orwig, G.W. (1993). New technologies for education: A beginner's guide. Englewood, CO: Libraries Unlimited.

Becker, H.J. (1994). How exemplary computer-using teachers differ from other teachers: Implications for realizing the potential of computers in schools. *Journal of Research on Computing in Education, 26*(3), 291-321.

Benson, J., & Bandalos, D. (1992). Second-order confirmatory factor analysis of the recreations to tests' scale with cross-validation. *Multivariate Behavioural Research, 27,* 459-487.

Benson, J., & El-Zahhar, N. (1994). Further refinement and validation of the revised test anxiety scale. *Structural Equation Model: A Multidisciplinary Journal, 1*(3), 203-221.

Benson, J., Moulin-Julian, M., Schwarzer, C., Seipp, B., & El-Zahhar, N. (1992). Cross-validation of a revised test anxiety scale using multi-national samples. In K. Hagtvet (Ed.), *Advance in test anxiety research*, (Vol. 7, pp. 62-83). Lisse, Netherlands: Swets & Zeitlinger.

Bollen, K.A., & Long, J.S. (1993). *Testing Structural Equation Models.* London: Sage.

Breithaupt, D.L. (1997). Collaborative computer education for pre-service and in-service teachers. In D. Willis, B. Robin, J. Willis, J. Price, & S. McNeil (Eds.), *Technology and teacher training annual,* (pp. 729-731). Charlottesville, VA: Association for the Advancement of Computing in Education.

Browne, M., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K.A. Bollen, & J.S. Long (Eds), *Testing structural equation models.* Newbury Park, CA: Sage.

Bullard, M.H. (1998). *University professor's attitudes toward educational technology: An analysis of selected variables.* Unpublished doctoral dissertation, University of Southern Mississippi.

Burnaska, K.K. (1998). *The effects of using instructional technology on student motivation, achievement and resource management skills in higher education.* Unpublished doctoral dissertation, University of Illinois, Urbana Champaign.

Campus Computing Project. (2001). *eCommerce comes slowly to the campus.* Encino, CA: Campus Computing.

Chin, S.S., & Hortin, J.A. (1993). A survey on the perceptions of elementary teachers' use of technology and the implications for in-service. *International Journal of Instructional Media, 20*(4), 317-325.

Cuban, L. (1993). Computers meet classroom: Classroom wins. *Teachers College Record, 95*(2), 185-210.

Dusick, D.M. (1998). What social cognitive factor influence faculty member's use of computers for teaching? A literature review. *Journal of Research on Computing in Education, 31*(2), 123-138.

Fishbein, M. (1993). Introduction. In D.J. Terry, C. Gallois, & M. McCamish, (Eds.), *The theory of reasoned action: Its application to AIDS-preventive behaviour* (pp. xv-xxv). Oxford, U.K.: Pergamon.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behaviour: An introduction to theory and research.* Reading, MA: Addison-Wesley.

Fox, K.M. (1996). Maintaining a leisure fugue: An ecofeminist voice about leisure and technology. *Schole: A Journal of Leisure Studies and Recreation Education, 11,* 123-132.

Godin, G., & Kok, G. (1996). The theory of planned behaviour: A review of its applications to health-related behaviours. *American Journal of Health Promotion, 11,* 87-98.

Grabinger, S.R., & Duffield, J.A. (1996). *Problem-Based learning as a rich environment for active learning.* Paper presented at the Annual Convention of American Education Research Association, New York, NY.

Hannah, C.L., & Abate, R.J. (1993). Survey on faculty use of interactive videodisk technology in teacher education. *Journal of Educational Technology Systems, 21*(4), 321-332.

Heath, C.L. (1996). *Faculty attitudes towards distance education and use of instructional technology.* Unpublished doctoral dissertation, University of San Francisco.

Hiatt, L.A. (1998). *An investigation of factors related to the application of instructional technology by Florida high school teacher (Computers).* Unpublished doctoral dissertation, University of Central Florida.

Hill, J.M. (1996). Considerations in the use of computer technology as an educational tool. *Schole: A Journal of Leisure Studies and Recreation Education, 11,* 133-141.

Hoffman, B. (1996). Managing the information revolution: Planning the integration of school technology. *NASSP Bulletin, 80*(582), 89-98.

Hrubes, D., Ajzen, I., & Diagle, J. (2001). Predicting hunting intentions and behaviour: An application of the theory of planned behaviour. *Leisure Science, 23,* 165-178.

Jensen, M.A. (1998). Challenges and trend in higher education. *Schole: A Journal of Leisure Studies and Recreation Education, 13,* 75-80.

Joreskog, K. & Sorbom, D. (1996). *PRELIS 2: User's reference guide.* Chicago, IL: Scientific Software International.

Levine, S.R. (1995). Teachers using technology: Barriers and breakthroughs. *International Journal of Education Telecommunications, 1*(1), 53-70.

Love, C.S. (1996). Computers in the classroom: clarifying communication, increasing comprehension. *Schole: A Journal of Leisure Studies and Recreation Education, 11,* 117-122.

Madden, T.J., Ellen, P.S., & Ajzen, I. (1992). A comparison of the theory of planned behaviour and the theory of reasoned action. *Personality and Social Psychology Bulletin, 18,* 3-9.

McLean, D.D., & Hill, J.M. (1993). Supporting internship preparation: a case study in computer-based support. *Schole: A Journal of Leisure Studies and Recreation Education, 8,* 37-49.

Mihalik, B.J. (1989). A strategy for adopting microcomputer technology into leisure studies curricula. *Schole: A Journal of Leisure Studies and Recreation Education, 4,* 105-118.

Mu, L. (1997). *A Study of Computing Education Needs among College of Education Faculty.* Unpublished doctoral dissertation, University of Tennessee, Knoxville.

Norum, K.E., Grabinger, S.R., & Duffield, J.A. (1999). Healing the universe is an inside job: Teachers' views on integrating technology. *Journal of Technology and Teacher Education, 7*(3), 187-203.

Norum, K., & Lowry, M. (1995). *The heart of educational restructuring: Dealing with change.* Paper presented at the Annual Meeting of the Association for Educational Communications and Technology, Anaheim, CA.

Office of Technology Assessment. (1995). *Teachers and technology: Making the connection.* Washington, DC: U.S. Government Printing Office.

Orlansky, J. (1983). Effectiveness of CAI: A different finding. *Electronic Learning, 3*(1), 58, 60.

Palazzo, A. (1995). Five great technology plans. *Electronic Learning, 14*(7), 31-39.

Peck, K.L., & Dorricott, D. (1994). Why use technology? *Educational Leadership, 51*(7), 11-14.

Polin, L. (1992). *Making changes in teachers' understanding and use of technology for instruction.* Paper presented at the annual conference of the American Educational Research Association, San Francisco, CA.

Robert, N., & Ferris, A. (1994). Integrating technology into a teacher education program. *Journal of Technology and Teacher Education, 2*(3), 215-225.

Salant, P., & Dillman, D.A. (1994). *How to conduct your own survey.* New York, NY: John Wiley & Sons.

Sammons, M.C. (1994). Motivating factors to use multimedia as a lecture tool. *Technology Horizons in Education, 21*(7), 88-90.

Spotts, T.H. (1998). *Faculty use of instructional technology in higher education: Profiles of contributing and deterring factors.* Unpublished doctoral dissertation, Michigan State University.

Spotts, T., & Bowman, M. (1995). Faculty use of instructional technologies in higher education. *Educational Technology, 35*(2), 35, 56-64.

Sutton, S. (1998). Predicting and explaining intentions and behaviour: How well are we doing? *Journal of Applied Social Psychology, 28,* 1317-1338.

Thompson, E.L. (1986). *Incentives supporting the use of instructional technology in higher education.* Unpublished doctoral dissertation, Indiana University, Bloomington.

Vogt, C.A., Hase, H., Reyonolds, M., & Virden, R. (1996). Adding an essential learning tool in a recreation curriculum: Computer education. *Schole: A Journal of Lesiure Studies and Recreation Education, 11,* 85-98.

Wellburn, E. (1996). *The status of technology in education system: A literature review,* [Internet]. Retrieved June 10, 2004 from <http://www.ect.bc.ea /lists/nuggets/EdTech_report.html>.

Williams, A.E. (1994). Computer literacy in accreditation: Putting students in the driver's seat. *Parks and Recreation, 29*(6), 54-57.

Wright, S.W. (1998). Technology's little quirk: Faculty say it doesn't work well. *Community College Week, 11*(6), 14.

Young, J.R. (1997). Canadian university promises it won't require professors to use technology. *The Chronicle of Higher Education, 44*(6), pA28, 2/3p, 1c.