UNIVERSITY STUDENTS' ATTITUDES TOWARD ONLINE LEARNING IN A BLENDED COURSE

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Abstract:

In spite of the trend toward online learning in higher education in Australia, few research examined university students' online learning attitude changes and the factors which could predict their attitude changes. The paper aimed to investigate 120 Australian university students' attitudes toward online learning in a blended course. The factors, such as prior attitudes, prior experiences, and motivation, were examined with the participants' online learning attitudes by the end of the course. Two phases in the study included the pre- and post-test and course participation (developed from the data of the students' weekly reports and online forum transcripts) in Phase One and interviews in Phase Two. It was found that the students became more positive toward online learning by the end of the course. The predictors for their online learning attitudes by the end of the course were their prior online learning attitudes and motivation in learning.

I. Introduction

With the wide application of the information and communication technologies (ICTs), especially the Web 2.0, learning in higher education in Australia has been transformed from traditional mode of learning to online or blended learning, which is supported by a variety of online learning tools (Kukulska-Hulme, 2012; Lee & McLoughlin, 2011; Njagi, Smith, & Isbell, 2003; Upton, 2005). Blended learning provides students with better access and control of their studies through an array of information and communication technologies (ICTs), and both face-to-face contact and online communication can be remained in their learning (Balsera, 2001; Harding, Kaczynski, & Wood, 2005; McCarthy, 2010).

Student attitude toward online learning is a critical factor in the learning environment supported by online learning tools. People's attitudes relate to what they think and feel about, and how they behave toward an attitude object (Triandis, 1971). Strong attitudes can guide behaviour and positive attitudes towards learning can contribute to the effective employment of learning strategies (Maio & Haddock, 2009).

The present study aims to examine several factors' influence on a group of university students' attitudes toward online learning and their online learning attitude changes in a blended course. The followings sections review the previous research on several factors' influence on students' online learning attitudes, such as prior attitudes, prior experiences, and motivation in learning.

II. Literature review

Students' prior experiences

Prior experiences in the present study comprised prior ICT experiences and prior subject knowledge. Some researchers reported that students' prior experiences of ICT usage could influence their attitudes toward online learning (Stephens & Creaser, 2004; Spiceland & Hawkins, 2002). However, other researchers reported that no significant impact of prior ICT experiences on students' attitudes in online learning (e.g., Buzzetto-More & Sweat-Guy, 2006).

Meanwhile, students' prior familiarity with the subject areas could have an impact on their perception of the online courses (Hong, Ridzuan, & Kuek; 2003). Students' familiarity with the subject area can

help students reduce their anxiety and perceived difficulty level in an online course (Gunnarsson, 2001).

Students' prior attitudes

Students' prior attitudes consisted of their prior attitudes toward ICT usage, the subject area, and online learning. The findings by Wang, Kanfer, Hinn, and Aran (2001), and An and Frick (2006) indicated that the students' prior attitudes toward ICT usage could influence their attitudes toward online learning. Gunnarsson (2001) and Suanpang (2007) reported the significant relationship between the students' subject attitudes and their online learning attitudes when they took an online course. Lim, Morris, and Yoon (2006) found that the students, who preferred online learning method, showed significantly higher level of course satisfaction than those who did not. However, Roberts and Dyer (2005) found that the participants' confidence in online learning prior to the course could not predict their attitude toward online learning after the course.

Students' motivations in learning

In the present study, the students' motivation in learning ranges from intrinsic to extrinsic motivation, based on self-determination theory (Deci & Ryan, 1985). Students can be motivated intrinsically by interest, excitement, confidence, and the learning activity itself. On the other hand, they can also be motivated extrinsically by serveral external factors, such as pressures, rewords, or recognition of other people (Deci & Ryan, 1985; Ryan & Deci, 2000). Previous research has reported the influence of motivation on students' online learning attitudes (Mullen & Tallent-Runnels, 2006; Paechter, Maier & Macher, 2010). The students who were more motivated intended to be more positive toward learning in an online environment.

Although there was a large amount of research addressing students' attitudes toward online learning, there were still many conflicting and unclear results. Moreover, locating and obtaining accurate answers from out-of-attendance students maybe challenging, so the study on enrolled students' attitude changes can not only shine some implications for course design, teaching behaviour, and support in the online courses, but also provide information for the future study on students' withdrawal from online courses.

Therefore, further investigation is needed to be conducted on students' online learning attitudes, such as a) which factors can significantly influence students' attitudes toward online learning; b) whether students' online learning attitudes will be improved after learning in an environment supported by online learning tools; and c) which factors may attribute to their online learning attitude changes.

III. Research methodologies

Design of the study

The present study was a part of the research project conducted among a group of university students. The research consisted of two phases: Phase One ── questionnaire survey of pre- and post-test, weekly reports about the course experience, and online forum contributions, and Phase Two ── interviews. The pre-test and post-test were respectively carried out at the beginning (Time one — T1) and the end of the course (Time Two — T2). The data from weekly reports and online forum contribution were regarded as the course engagement factors.

The students' prior experiences (of ICT usage and the subject area), prior attitudes (toward ICT usage, the subject area, and online learning), and motivation were measured in the pre-test. Their online learning attitudes were measured again in the post-test. The students were asked to complete a short questionnaire of weekly report for six weeks and their online forum contribution were treated together with their answers to the weekly reports as the course engagement. The influence of the factors at T1 and the data from the weekly reports and online forum transcripts on the students' online learning attitudes at T2 was examined. The interviews in Phase two gained more detailed and in-depth

information about the interviewees' learning experience to clarify the potential causes for online learning attitude changes.

Instruments

The pre-test questionnaire in the present study contained seven sections: (a) demographic information; (b) prior experience of ICT usage; (c) prior experience of the subject area study; (d) motivational learning strategies; (e) attitudes toward ICT use; (f) attitudes toward the subject area; and (g) attitudes toward online learning.

The prior experience of ICT usage indicated the frequency of the students' application of various ICT tools. A six-point scale was used with "1= never", "2 = rarely", "3 = once a month", "4 = once a week", "5=a few times a week", and "6=everyday". The prior subject experience was indicated by the scale from "1= not familiar with it at all" to "4 = very familiar".

The instruments about the students' attitudes toward ICT usage and the subject area were designed based the previous research by Chamber and Clarke's (1987), Jones and Clarke's (1994), Drambot, Watkins-Matek, Silling, Marshall, and Garver (1985), and Loyd and Gressard (1984). As the blended course in the present study was relevant to ICT usage in education, the items about the students' subject attitudes adopted the same patterns of the ICT attitude instruments. The questions about ICT and the subject attitudes consisted of interest, likeness, confidence, comfort, usefulness, difficulty and anxiousness. A four-point scale was used from "1= strongly disagree" to "4 = strongly agree".

Based on the research about students' online learning attitudes (Knowles & Kerkman, 2007; Robinson & Doverspike, 2006; Yudko, Hirokawa, & Chi, 2008), the instruments measuring online learning attitudes included the students' affective perception about (such as likeness, interest, comfort, usefulness, confidence, anxiety, and perceived difficulty), belief in, and intention of learning online. A four-point scale was used from "1 = strongly disagree" to "4 = strongly agree".

The instruments of motivational learning strategies were based on the items by Pintrich, Smith, Garcia and McKeachie (1991, 1993), Pintrich and Groot (1990), Lan, Bremer, Stevens, and Mullen (2004), and Barnard, Paton, and Lan (2008). Pintrich (et al., 1991, 1993) and Pintrich and Grooe (1990) established the instruments to measure students learning motivation and their application of different learning strategies. Lan (et al., 2004) and Barnar (et al., 2008) developed the items about self-regulated learning in online or blended learning environment. In the present study, 49 items was generated based on the above research. Both motivational and cognitive strategies were cited and a five-point scale was used from "1= not like me at all" to "5 = very much like me".

The instruments of the weekly reports included the number of the reports the students finished, length of the reports, positive and negative comments on the course experiences. The data of the online forum contributions for 12 weeks in the semester were recoded as the number of contributions, the latency of the first post each weeks, and the length of the contribution in total.

In the post-test, the sections of the students' names, experience of ICT use, and attitudes (toward ICT usage, the subject area, and online learning) were remained the same as the pre-test. The reasons for the application of the repeated instruments were (a) to match the responses of the pre-test and the post-test and examine the difference in the students' online learning attitudes between the two occasions; (b) to investigate which factors could influence the students' online learning attitudes in the post-test; and (c) to keep contact with the participants who might be invited for the interviews.

The interviews obtained detailed information from the students' self-report experience of their interaction with online course content, the course website and online learning tools, and their communication with the teachers and other students. The interviewees were also asked to provide attitudinal statements about the course experience in general.

Participants

One hundred and twenty second-year pre-service teacher education students, who took a blended course "Information and Communication Technologies in Learning and Teaching" in University of South Australia in the first half of 2011, participated in the present study. This course aimed to provide the students with theories, research and sound practices on using ICTs in learning and teaching. It blended traditional mode of teaching (lecture and tutorial every week on campus) and online learning (online course materials, participation in online forum, blogs, and wikis, communication through email, and application of online learning tools to facilitate the course tasks and assignments).

Procedure

The pre-test was carried out among 120 participants at the beginning of the course (T1). By the end of the course (T2), 94 out of them completed the post-test questionnaires. Twenty-six did not participate in the post-test, owing to their withdrawal from the course and absence from the tutorial. Among the 94 participants, 74 completed at least one weekly report and the online forum transcripts from the same 74 participants were gauged for further analysis on the factors' influence on the participants' attitudes toward online learning at T2.

Based on the comparison on the 94 participants' online learning attitudes between the T1 and T2, 11 participants with increases or decreases in their attitudes were identified. Invitation letters were sent to them by email and eight participants agreed to take part in the interviews. Among the eight interviewees, four and another four participants respectively showed increases and decreases in their online learning attitudes. These participants were divided into two groups, indexed as the Positive Change Group (the PCG) and the Contrast Group (the CG).

Data analysis

There were both quantitative and qualitative data in the present study. The analysis of the quantitative data from the pre- and post-test was performed on SPSS and Smart PLS model. Factor analysis was conducted for the construct development of all variables of prior experiences, prior attitudes, and motivation in the pre-test, in order to ensure the integrity and validity of each factor.

Regarding the variables in the weekly reports and online forum transcripts were tested by factor analysis and the integrity of the construct was tested through PLS modelling. A new construct — course participation was developed, which present the participants' course input through participating in the research project and online discussion.

Open-ended questions were used in the interviews. The themes of the qualitative data from the interviews were described and developed by coding the text data, developing a description, defining the themes from the data, and connecting and comparing the themes.

IV. Research results

Demographic information of the sample group

Among the 120 participant who completed the pre-test, 105 were females and 15 were males. The majority (63%) were among the age group of 15-20 years old. Among the 94 participants who participated in the post-test, 82 were females and 12 were males. Independent t-test was run to compare the pre-test answers from the two groups (the 120 and the 94 participants) and no significant differences were revealed. Therefore, the 94 participants could present the sample group for the further analysis.

The students' ICT experience at T1

Among different ICT usages, Email was used the most frequently by the participants. Publishing tools

were the ICT applications that the participants had least access to. In relation to social network tools, the participants used more for individual purpose than group collaboration. Online search engines were used more for general purpose rather than academic purpose (Table 1 in Appendix).

The students' motivation in learning

The items about the students' motivational learning strategies in the present study addressed the participants' capabilities of applying different motivational learning strategies. Based on the factor analysis, 22 (out of 49) items were remained and a four-factor solution was developed, which included (a) metacognitive awareness (various cognitive and metacognitive learning strategies to help the students learn better); (b) self-management (the capability of managing time, environment, attention, and effort for learning); (c) intrinsic orientation (learning motivated by interest, knowledge acquisition, and learning itself); and (d) performance orientation (learning driven by getting a good grade and approval from external context, such as families, friends, employers, and others). There are respectively 52%, 60%, 86%, and 87% of the participants were above the mid-point of the above four constructs of self-regulation (Table 2 in Appendix).

The students' prior attitudes measured at T1 and T2

In the pre-test, 97% and 80% of the participants showed higher scores than the mid-points of the items of ICT and subject attitudes respectively. Concerning the attitudes toward online learning, 74% in the sample group were above the mid-point (Table 3 in Appendix).

Regarding the attitudes at T2, all participants were above the mid-point of ICT attitudes at T2. There were 90% among the participants above the mid-point of subject attitudes. In regard with online learning attitudes, 87% scored higher than the mid-point (Table 4 in Appendix).

Comparison on the students' attitudes between T1 and T2

It was found that the participants became more positive in terms of their attitudes toward ICT use, the subject area, and online learning at T2 at a significant level (Table 5).

Table 5
Paired samples T-test of comparison between T1 and T2

	Possible maximum	*Mean (SD) T1*	*Mean (SD) T2*	*t*	*Sig.(2-tailed)*	*Effect size*
ICT attitudes	28	23.22 (2.9)	23.91 (3.0)	2.19	.031*	0.33
Subject attitudes	28	20.24 (2.6)	20.88 (2.9)	2.47	.015*	0.37
Online learning attitudes	24	33.03 (4.4)	34.83 (4.8)	4.10	.000**	0.63

Note. (a) $n = 94$, (b) The figures in this table represent the means with deviation in parentheses, (c) Effect sizes were calculated on the basis of Cohen's (1977) procedure or means testing on correlated samples (repeated measure)

The factors which influenced the students' online learning attitudes at T2

The participants' online learning attitude by the end of the course was tested through correlation with the factors at T1 and course participation, which was developed based on the factor analysis on the data from the weekly reports and online forum transcripts. The participants' online learning attitude at T2 was correlated with the factors at the beginning of the course, such as prior online learning attitudes, prior subject attitudes, prior ICT attitudes, intrinsic orientation, and performance orientation (Table 6 in Appendix). The predictors for their online learning attitudes at T2 were their prior online learning attitudes, intrinsic orientation, and performance orientation (Table 7). Course participation was not significantly related to the participants' attitude at T2.

Table 7
Regression on prediction of the participants' online learning attitudes at T2

Factors measured at T1	*B*	*Std. Error*	*β*	*t*	*Sig*
Model 1 (R = .62, R² = .38, R Square Change = .38, Sig. F Change = .001)					
Online learning attitudes	.63	.09	.62	6.68	.001
Model 2 (R = .70, R² = .49, R Square Change = .10, Sig. F Change = .001)					
Online learning attitudes	.62	.09	.61	7.22	.001
Intrinsic orientation	.38	.10	.32	3.77	.001
Model 3 (R = .72, R² = .52, R Square Change = .03, Sig. F Change = .034)					
Online attitudes	.63	.08	.62	7.44	.001
Intrinsic orientation	.30	.11	.25	2.81	.006
Performance orientation	.25	.11	.19	2.17	.034

Note. (a) n = 74, (b) Dependent Variable: online learning attitudes at T2

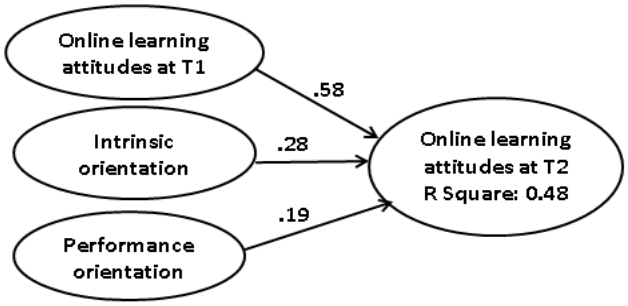

Figure 1. PLS model of the influence of online learning attitudes at T1, intrinsic orientation, and performance orientation on online learning attitudes at T2

As intrinsic orientation was found to have more significant predictive effect on the participants' online learning attitudes at T2 (Figure 1), One-way ANOVA was conducted to test the significance of the impact of intrinsic orientation on online learning attitudes at both T1 and T2. The participants were divided into two groups with higher and lower intrinsic orientation scores. The difference between the two groups was shown in Table 8 and Figure 2, which indicated that the participants with higher scores of intrinsic orientation became more positive toward online learning at T2

Table 8
Comparison on online learning attitudes between intrinsic orientation high group and intrinsic orientation low group at T1 and T2

	Sum of squares	*F*	*Sig.*
Online learning attitudes T1	5.39	.25	.617
Online learning attitudes T2	145.98	6.58	.012

Note. (a) n = 94

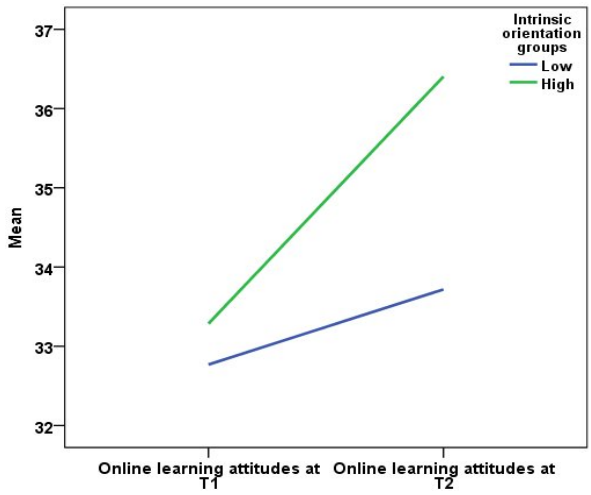

Figure 2 Line graph of the participants' online learning attitudes at T1 and T2 Note. Low = Intrinsic orientation low group, *n* = 39; High = Intrinsic orientation high group, *n* = 42

Results from the interviews with the Positive Change Group and the Contrast Group

The themes developed from the interviewees' statements were presented by the comparison between the PCG and the CG in tables. Regarding the statements made about the interaction with the online course content, the participants from the PCG revealed higher level of motivation in learning and perception of knowledge acquisition (Table 9 in Appendix)

In respect of the usage of the course website and various learning tools, both groups appreciated the flexible and convenient access to the course contents through the course website and well-designed course website. The participants from the PCG evaluated the online forum more highly than those in the CG (Table 10 in Appendix).

Concerning the online communication with the teachers, more participants in the PCG than the CG addressed timely and helpful responses from their teachers (Table 11 in Appendix). Both groups commented that they enjoyed the face-to-face communication with their teachers because of immediacy, easiness for understanding, and remained human factors (Table 12 in Appendix).

In regard with the online communication with other students, more participants from the PCG than the CG indicated that they enjoyed the convenience of using online communication, frequent communication, and timely responses and support from other students (Table 13 in Appendix). In terms of the face-to-face communication among the students, more participants from the PCG than the CG reported that they had frequent communication with their tutorial group members, received instant responses and help from their peers, perceived friendly learning environment in their tutorials, and had smooth team work with other students (Table 14 in Appendix).

Regarding the attitudinal statements about their course experience in general, the participants in the PCG reported higher level of knowledge acquisition, appreciated using online learning tools, and had more frequent communications with their teachers. They exhibited higher level of motivation in learning (Table 15 in Appendix).

V. Conclusion and Discussion

The result revealed that the students became more positive toward online learning by the end of course at a significant level. By completing the course, the students may become more familiar with

the subject area, more competent in using different online learning tools, and more capable of using the knowledge and skills acquired from the course into their future teaching. A well-replicated finding from social psychology is that people's attitudes tend to increase in the positive direction through mere exposure. The more experience a person has with the attitude object, the more favourably he or she will evaluate the object (Bornstein & D'Agostino, 1992; Greenwald & Banaji, 1995; Janiszewski, 1993; Murphy, et al., 1995; Zajonc, 1965). Therefore, the experience of this blended course increased the students' exposure to more online learning tools, which may lead to more positive attitudes toward online learning.

The findings of positive attitude changes in the present study accorded with the research by White, Troutman, and Chancey (1994). They concluded that computer lab usage correlated significantly with changes in the students' general attitude toward computers. Jung, Choi, Lim, and Leem (2002) also found that the learning experiences in an online environment brought about a positive attitude change concerning the use of the Web for learning among the students, regardless of the type of interaction. López-Pérez, Pérez-López, and Rodríguez-Ariza (2011) found that the use of blended learning environment had a positive effect in reducing the students' dropout rates and improving their exam marks. Lei (2010) indicated that blended learning experiences could be beneficial to reinforce students' understanding of the subject and enhance and support their learning process.

The regression and PLS models revealed that the factors which predicted the students' attitudes toward online learning by the end of the course were (a) their prior online learning attitudes; and (b) motivation including intrinsic and performance orientation. When prior online learning attitude was controlled, the students' with higher level of intrinsic orientation showed more positive changes in their attitudes toward online learning.

The influence of the prior online learning attitudes on the students' attitudes toward online learning at the end of the course was in accordance with the finding by Wang, Kanfer, Hinn and Arvan (2001). They found that the students' prior technology attitudes would continue affecting their attitude toward technology when they took an online course.

Some previous research has addressed how motivation could make a difference in the students' attitudes toward using technology in learning. Venkatesh, Speier, and Morris (2002) used and reanalysed the data from the previous two research (Venkatesh, 1999; Venkatesh & Speier, 1999) to develop an integrated model of technology acceptance. They reported that the technology acceptance model was redefined within a motivational framework and the resulting model comprised extrinsic and intrinsic motivations was the predictors of the students' intention to use technology. Lee, Cheung, and Chen (2005) found that both intrinsic (perceived enjoyment) and extrinsic motivation (perceived usefulness and ease of use) could significantly and directly affect the students' intention to use online learning medium.

Based on the interview results, three aspects were identified from the statements by the interviewees. Firstly, the students who were more motivated in the course appeared to realize the importance of the subject knowledge and have a positive perception toward learning. Bassili (2008) found that the students, who considered the course interesting and important and were motivated to do well, would show particularly positive toward learning the lecture online.

Secondly, the flexibility and convenience was highly evaluated by the students. The easy access to the course may be regarded as the most widely accepted advantage of online learning by the students from both the PCG and CG. Erdogan, Bayram, and Deniz (2008) found in their research that the online students claimed that they had more access to the Internet. The convenience and flexibility offered by online courses were also well documented by Poole (2000), Petrides (2002), Schrum (2002), and El Mansour, and Mupinga (2007).

Finally, teachers' frequent communication and timely feedback and support from peer students were also important for the students to maintain positive toward learning online. This finding was also

reported by Booth-Butterfield, Mosher, and Mollish (1992), who examined the relationship between teacher immediacy and students' involvement and attitudes in online learning. Additionally, high level of participation in online communication among the students can help to create a strong sense of community and increase the feeling of belonging and being connected among group members (Rovai, 2002).

Reference:

An, J., & Levin, J. A. (2003). *Online discourse patterns: Building an instructional framework for designing educational discourses on networks*. Paper presented at the the 84th AERA Annual Meeting, Chicago, IL. . http://lrs.ed.uiuc.edu/aera/03/communities/aera-03-an-levin-paper-fina.htm

Balsera, A. F. (2001). *The road ahead: the evolution of online learning.* Paper presented at the Information Technology & Teacher Education International Conference, Orlando, Florida.

Barnard, L., Paton, V. O., & Lan, W. Y. (2008). Online self-regulatory learning behaviors as a mediator in the relationship between online course perceptions with achievement. *International Review of Research in Open and Distance Learning*, *9*(2), 1-11.

Bassili, J. N. (2008). Motivation and cognitive strategies in the choice to attend lectures or watch them online. *The Journal of Distance Education*. *22*(3), 129-148.

Booth-Butterfield, S., Mosher, N., & Mollish, D. (1992). Teacher immediacy and student involvement: A dual process analysis. *Communication Research Reports*, *9*, 13-21.

Bornstein, R. F., & D'Agostino, P. R. (1992). Stimulus recognition and the mere exposure effect. *Journal of Personality and Social Psychology*, *63*(4), 545–52.

Buzzetto-More, N., & Sweat-Guy, R. (2006). Incorporating the hybrid learning model into minority education at a historically black university. *Journal of Information Technology in Education*, *5,* 153-164.

Chambers, S.M., & Clarke, V. A. (1987). Is inequality cumulative? The relationship between disadvantaged group membership and students' computing experience, knowledge, attitudes and intentions. *Journal of Educational Computing Research*, *3*(4), 495-518.

Cohen, J. (1977). *Statistical power analysis for behavioural sciences* (revised ed.). New York: Academic Press.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviours.* New York: Plenum.

Drambot, F. H., Watkins-Matek, M. A., Silling, M. S., Marshall, R. S. & Garver, J. A. (1985). Correlations of sex differences in attitudes toward and involvement with computers. *Journal of Vocational Behaviour*, *27*, 71-86.

El Mansour, B., & Mupinga, D. M. (2007). Students' positive and negative experiences in hybrid and online classes. *College Student Journal, 41*(1), 242-248.

Erdogan, Y., Bayram, S., & Deniz, L. (2008). Factors that influence academic achievement and attitudes in web based education. *International Journal of Instruction*, *1*(1), 31-48.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review*, *American Psychological Association, Inc. 102*(1), 4–27.

Gunnarsson, C. L. (2001). Development and assessment of students: Attitudes and achievement in a business statistics course taught online. *Interactive Multimedia Electronic Journal of Computer-Enhanced Learning*, *3*(2). Retrieved from: http://imej.wfu.edu/articles/2001/2/07/index.asp

Harding, A., Kaczynski, D., & Wood, L. N. (2005). Evaluation of Blended Learning: Analysis of Quantitative Data, *UniServe Science Blended Learning Symposium Proceedings*: 56—72, retrieved from http://sydney.edu.au/science/uniserve_science/pubs/procs/wshop10/2005Harding.pdf

Hong, K.-S., Ridzuan, A. A., & Kuek, M.-K. (2003). Students' attitudes toward the use of the Internet for learning: A study at a university in Malaysia. *Educational Technology & Society*, *6*(2), 45-49.

Janiszewski, C. (1993). Preattentive mere exposure effects. *Journal of Consumer Research*, *20*, 376–392.

Jones, T., & Clarke, V. A. (1994). A computer attitude scale for secondary students. *Computers in Education*, *4*(22), 315-318.

Jung, I., Choi, S., Lim, C., & Leem, J. (2002). Effects of Different Types of Interaction on Learning Achievement, Satisfaction and Participation in Web-Based Instruction. *Innovations in Education and Teaching International*, *39*(2), 153-162.

Knowles, E., & Kerkman, D. (2007). An investigation of students attitude and motivation toward online learning. *Student Motivation*, *2*, p. 70-80

Kukulska-Hulme, A. (2012). How should the higher education workforce adapt to advancements in technology for teaching and learning? *The Internet and Higher Education, 15*(4), 247-254.

Lan, W. Y., Bremer, R., Stevens, T., & Mullen, G. (2004). *Self-regulated learning in the online environment.* Paper presented at the annual meeting American Educational Research Association, San Diego, California.

Lee, M. K. O., Cheung, C. M. K., & Chen, Z. (2005). Acceptance of Internet-based learning medium: The role of extrinsic and intrinsic motivation. *Information & Management, 42*(8), 1095-1104.

Lee, M. J. W., & McLoughlin, C. (2011). *Web 2.0-based e-learning: Applying social informatics to tertiary teaching*. Hershey, PA: IGI Global.

Lei, J. (2010). Quantity versus quality: a new approach to examine the relationship between technology use and student outcomes. *British Journal of Educational Technology, 41*(3), 455-472.

Loyd, B. H., & Gressard, C. (1984). Reliability and factorial validity of computer attitude scales. *Educational Psychological Measurement*, *44*(2), 501-505.

López-Pérez, M. V., Pérez-López, M. C., & Rodríguez-Ariza, L. (2011). Blended learning in higher education: Students' perceptions and their relation to outcomes. *Computers & Education, 56*(3), 818-826.

Maio, G., & Haddock, G. (2009). The psychology of attitudes and attitude change. London: SAGE Publications.

McCarthy, J. (2010). Blended learning environments: Using social networking sites to enhance the first year experience. *Australasian Journal of Educational Technology, 26*(6), 729-740.

Mullen, G. E., &Tallent-Runnels, M. K. (2006). Student outcomes and perceptions of instructors' demands and support in online and traditional classrooms. *Internet and Higher Education*, *9*(4), 257-266.

Murphy, S. T., Monahan, J. L., & Zajonc, R. B. (1995). Additivity of nonconscious affect: combined effects of priming and exposure. *Journal of Personality and Social Psychology*. *69*(4), 589–602.

Njagi, K., Smith, R., & Isbell, C. (2003). Assessing students' attitudes toward Web-based learning resources. from http://naweb.unb.ca/proceedings/2003/PosterNjagilsbell.html

Paechter, M., Maier, B., & Macher, D. (2010). Students' expectations of, and experiences in e-learning: Their relation to learning achievements and course satisfaction. *Computers & Education, 54*, 222–229.

Petrides, L. A. (2002). Web-based technologies for distributed (or distance) learning: Creating learning-centred educational experiences in the higher education classroom. *International Journal of Instructional Media, 29*(1), 69-77.

Pintrich, P.R., & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, *82*(1), 33–40.

Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ).* Ann Arbor, MI: National Center for Research to Improve Postsecondary Teaching and Learning. (ERIC Document Reproduction Service No. ED 338 122).

Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1993). Reliability andn predictive validity of the Motivated Strategies for Learning Questionnaire (MSLQ). *Educational and Psychological Measurement*, *53*, 801-813.

Poole, D. M. (2000). Student participation in a discussion-oriented online course: A case study. *Journal of Research on Computing in Education, 33*(2), 162-177.

Roberts, T. G., & Dyer, J. E. (2005). The relationship of self-efficacy, motivation, and critical thinking disposition to achievement and attitudes when an illustrated web lecture is used in an online learning environment. *Journal of Agricultural Education*, *46*(2), 12-23.

Robinson, R. P., & Doverspike, D. (2006). Factors predicting the choice of an online versus a traditional course, *Teaching of Psychology, 33*(1), 64-68.

Rovai, A. P. *(*2002*)*. Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *Internet and Higher Education, 5*(4)*,* 319–332.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68-78.

Schrum, L. (2002). Oh, What wonders you will see: Distance education past, present, and future. *Learning and Leading with Technology, 30*(3), 7-9.

Spiceland, J. D., & Hawkins, C. P. (2002). The impact on learning of an asynchronous active learning course format. In *Journal of Asynchronous Learning Networks, 6*(1), 68-75.

Stephens, D., & Creaser, C (2004). Information science student IT experience and attitude toward computers: Results of a five-year longitudinal study. *Innovations in Teaching and & Learning in Information & Computer Sciences*, *1*(2), 1-18.

Suanpang, P. (2007). Students' experience online learning in Thailand. In S. Hongladarom (Ed.), *Computing and Philosophy in Asia*. Newcastle: Cambridge Scholars Publishing.

Tiene, D., & Ingram, A. (2001). *Exploring current issues in educational technology*. Boston, MA: McGraw-Hill Publishing Company.

Upton, D. (2005). Online learning in nutrition and dietetics: Student performance and attitudes. *The Internet Journal of Allied Health Sciences and Practice, 3*(1).

Venkatesh, V. (1999). Creation of favourable user perceptions: Exploring the role of intrinsic motivation. *MIS Quarterly*, *23*(2), 239-260.

Venkatesh, V., & Speier, C. (1999). Computer technology training in the work-place: A longitudinal investigation of the effect of mood. *Organizational Behaviour and Human Decision Processes*, *79*(1), 1-28.

Venkatesh, V., Speier, C., & Morris, M. G. (2002). User acceptance enablers in individual decision making about technology: Toward an integrated model. *Decision Sciences 33*(2), 297–316.

Wang, X. C., Kanfer, A., Hinn, D. M., & Arvan, L. (2001). Stretching the boundaries: using ALN to reach on-campus students during an off-campus summer session. *Journal of Asynchronous Learning Networks*, *5*(1), 1-20.

White, J. A., Troutman, A. P., & Chancey, M. R. (1994): Accessing ICLAS Network Log Data to Study Student Computer Usage, Course Performance, and Attitude Change. *Journal of Information Technology for Teacher Education*, *3*(1), 79-89.

Yudko, E., Hirokawa, R., & Chi, R. (2008). Attitudes, beliefs, and attendance in a hybrid course. *Computer and Education*, *50*(4), 1217-1227.

Zajonc, R. (1965). Social facilitation. *Science*, *149*(3681), 269–274.

Appendix

Table 1
Frequency of ICT experience at T1

	Mean	*SD*	*Skewness*	*Kurtosis*	*Minimum*	*Maximum*
Computer application software	5.14	.79	-.78	.38	3	6
Publishing tools	2.88	1.27	.71	-.33	1	6
Email	5.78	.43	-1.7	1.77	4	6
Individual-based social network	5.33	1.25	-2.18	4.19	1	6
Group-based social network	3.87	1.37	-.37	-.77	1	6
Web search engines (general)	5.48	.62	-.76	-.40	4	6
Web search engines (academic)	4.19	.95	-.15	-.67	2	6

Note. (a) n = 120, (b) Natural mid-point = 3.5, (c) Computer application software = Word processing, database system, Speadsheets, presentation graphics; Publishing tools = desktop publishing, Web publishing; individual-based social network = MySpace, Facebook, Twitter, Video conferencing, Skype; Group-based social network = Wiki, bulletin board system, Weblogs, online forum, YouTube, chat rooms; Web search engines (general) = Google, Yahoo!, Ask.com, Being; Web search engines (academic) = online academic journals, Google Scholar, Eric, online library, Academic Search

Table 2
Frequency of motivational strategies

	Mean	*SD*	*Skewness*	*Kurtosis*	*Natural mid-point*	*Minimum*	*Maximum*
Metacognitive awareness	15.78	3.47	-.18	-.36	15	7	23
Self-management	19.53	4.35	.02	-.24	18	9	30
Intrinsic orientation	22.57	3.48	.02	1.73	18	13	36
Performance orientation	18.70	3.44	-.14	1.24	15	9	30

Note. (a) n = 120

Table 3
Frequency of the attitudes at T1

Attitudes at T1	*Mean*	*SD*	*Skewness*	*Kurtosis*	*Natural mid-point*	*Minimum*	*Maximum*
ICT attitudes	23.13	3.23	-.57	1.60	17.5	10	28
Subject attitudes	20.14	2.73	-.44	1.64	17.5	9	28
Online learning attitudes	33.03	4.92	-.68	1.83	30	15	48

Note. n = 120

Table 4
Frequency of the attitudes at T2

Attitudes at T2	*Mean*	*SD*	*Skewness*	*Kurtosis*	*Natural mid-point*	*Minimum*	*Maximum*
ICT attitudes	23.91	2.97	.04	-1.43	17.5	19	28
Subject attitudes	20.88	2.91	.28	1.00	17.5	13	28
Online learning attitudes	34.83	4.75	.09	1.43	30	20	48

Note. (a) n = 94

Table 6

Correlations between the factor at T1 and the students' online learning attitudes at T2

Factors measured at T1	*Online learning attitudes at T2*
Online learning attitudes	.62**
Intrinsic orientation	.33**
Subject attitudes	.31**
Performance orientation	.28*
ICT attitudes	.28*

Note. (a) n = 74, (b) *. Correlation is significant at the 0.05 level (2-tailed). **.Correlation is significant at the 0.01 level (2-tailed).

Table 9

Frequency of the statements about the interaction with the online course content

Self-reported learning experiences	*Instance cited by the PCG participants (n = 4)*	*Instance cited by the CG participants (n = 4)*
Theme 1: High level of knowledge acquisition	4	1
Theme2: No knowledge acquisition	0	2
Theme3: Feeling motivated to use online resources and learning tasks	4	2
Theme4: No interest in the course	0	2
Theme5: Lack of detailed information about course assessment	2	4

Table 10

Frequency of the statements about the interaction with the course website and online learning tools

Self-reported learning experiences	*Instance cited by the PCG participants (n = 4)*	*Instance cited by the CG participants (n = 4)*
Theme 1: Easy access to the course through course website	4	3
Theme 2: Well-designed course website	4	3
Theme 3: Effective use of online forum	3	1
Theme 4: Insufficient use of online forum	0	3

Table 11

Frequency of the statements about the online communication with the teachers

Self-reported learning experiences	*Instance cited by the PCG participants (n = 4)*	*Instance cited by the CG participants (n = 4)*
Theme 1: Convenience of using email	4	4
Theme2: Timely response from the teachers through emails	4	2
Theme3: No timely responses from the teachers	0	2
Theme4: Helpful responses from the teachers through emails	4	3

Table 12
Frequency of the statements about the face-to-face communication with the teachers

Self-reported learning experiences	*Instance cited by the PCG participants (n = 4)*	*Instance cited by the CG participants (n = 4)*
Theme 1: perceived immediacy through face-to-face interaction	4	4
Theme 2: perceived easiness for understanding	4	4
Theme 3: Human factors maintained	2	2
Theme 4: Enjoyment in teachers' teaching in lectures and workshops	4	0

Table 13
Frequency of the statements about the online communication with peers

Self-reported learning experiences	*Instance cited by the PCG participants (n = 4)*	*Instance cited by the CG participants (n = 4)*
Theme 1: Convenience of using online communication	4	2
Theme 2: Frequent online communication	4	1
Theme 3: Timely responses from other students	4	1
Theme 4: Receiving support and help from other students online	4	2
Theme 5: A larger group of recipients through online communication	3	1

Table 14
Frequency of the statements about the face-to-face communication with peers

Self-reported learning experiences	*Instance cited by the PCG participants (n = 4)*	*Instance cited by the CG participants (n = 4)*
Theme 1: Frequent communication with other students in the workshop	4	0
Theme 2: Receiving instant responses	4	2
Theme 3: Perceived easiness for understanding	4	1
Theme 4: support and help from other students in workshops	3	1
Theme 5: Perceived friendly learning environments in workshops	3	0
Theme 6: Maintained human factors	4	1
Theme 7: Smooth team work for group presentation	4	2

Table 15
Frequency of the attitudinal statements in the general

	Instance cited by the PCG participants (n = 4)	*Instance cited by the CG participants (n = 4)*
Theme 1: Knowledge acquisition from the course	4	0
Theme 2: No knowledge gained from the course		2
Theme 3: No interest in the subject	0	2
Theme 4: Appreciation of online learning tools	4	0
Theme 5: Frequent online and offline communication with the teachers and other student	4	0