Ogata, H. et al. (Eds.) (2015). Proceedings of the 23rd International Conference on Computers in Education. China: Asia-Pacific Society for Computers in Education

# University Students' Attitude Changes Toward Online Learning And Course Participation In A Blended Course

**Yue ZHU [a], Wing AU[b], & Greg YATES[c]**

[a] *Colledge of Education, FuJian Normal University, China*
[b c]*School of Education, University of South Australia, Australia*
zhu.yue@hotmail.com

**Abstract:** This study sought to investigate students' attitude changes toward online learning and course participation among 94 second-year university students in a blended course. The participants' attitude changes were captured by pre- and post-tests, which measured their online learning attitudes at the beginning and the end of the blended course. The participants' course participation was measured by interviews, which obtained detailed and in-depth information about their learning experiences to clarify the potential causes for the changes in their attitudes toward online learning. It was found that the individuals, who evidenced positive changes in their attitudes towards online learning, showed greater interest in the course and reported higher levels of course participation and perceived learning outcomes. These individuals disclosed higher levels of interactions with their peers and the instructors.

**Keywords:** blended learning, attitudes toward online learning, interactions

## 1. Introduction

Online learning is a mode of learning by which students acquire knowledge and construct personal meaning using Internet technologies (e.g., Web 2.0 and personal or mobile technologies) to access learning materials, interact with teachers and other students, and obtain support during learning process (Lee & McLoughlin, 2011; Yuan, Powell, & Olivier, 2014). Especially after the Web 2.0 and personal and mobile technologies were applied in education, online learning (such as Massive Open Online Courses) can be accessible via online course materials and synchronous and asynchronous communications. Within higher educational sections, online materials have developed into an integral part of course materials and complements traditional mode of learning (Oliver & Omari, 2001). Innovative applications of technologies have begun to blur the distinctions between traditional face-to-face and online learning environments (Sharma, 2010).

Attitudes are based on evaluative concepts regarding the characteristics of the referent object and give rise to motivated behaviour (Rajecki, 1990). It is commonly assumed that strong attitudes would guide and could predict behaviour (Maio & Haddock, 2009). Rodriguez, Ooms, and Montañez (2008) suggested that students' attitudes toward their online learning experiences could be a determining factor for their success in online learning. Having positive attitudes, students may tend to be motivated toward their online learning. In contrast, the students with negative attitudes may not be actively engaged in learning or achieve desired learning outcomes.

Students' course participation can be indicated by their interaction with several aspects of online learning, such as student-content, student-interface, student-teacher, and peer interactions. It was found that students' interactions with online course content were mainly indicated by their self-reported experiences of learning from the course content. Some important factors were addressed in the existing studies, such as (a) the frequency of learning from course content (Milligan, Littlejohn, & Margaryan, 2013); (b) satisfaction with the course content design (Paechter, Maier, & Macher, 2010); and (c) course requirements (Choy, McNickle, & Clayton, 2003). It is assumed there is a significant relationship between students' interactions with online course content and their attitudes toward online learning (Gunawardena, Linder-VanBerschot, LaPointe, & Rao, 2010; Paechter et al., 2010).

Existing research found that students' interactions with course interface addressed the students' self-reported experiences of using online learning components, e.g., perceived flexibility (Arbaugh & Benbunan-Fich, 2007), design of the course website (Bruff, Fisher, McEwen, & Smith,

2013), easiness of usage (Waite, Mackness, Roberts, & Lovegrove, 2013), and level of interactivity (Kettanurak, Ramamurthy, & Haseman, 2001), and technical support (Lee, Srinivasan, Trail, Lewis, & Lopez, 2011). It was found that positive experiences of technology use during learning might contribute to students' positive attitudes in online learning (Lee et al., 2011).

The research which examined student-teacher interactions was mainly based on students' self-reported experiences from several aspects, e.g., teaching presence (Paechter et al., 2010; Bruff et al., 2013), frequency of communication with teachers (Tu & Corry, 2003), immediacy of teachers' responses (Bruff et al., 2013; Russo & Benson, 2005), teachers' encouragement and facilitation in online discussion (Choy, McNickle, & Clayton, 2003), and teachers' support (Cashion & Palmieri, 2002). It appears that high levels of student-teacher interactions may possibly contribute to students' positive attitudes in online learning (Paechter et al., 2010).

The research concerning peer interactions mainly focused on students' self-reported experiences, e.g., frequency of peer interactions (Milligan et al., 2013), relationship with other students (Russo & Benson, 2005), feeling of isolation (Herrington, Oliver, & Reeves, 2003), and group work (McAlister, Rivera, & Hallam, 2001). It appears that the students with higher levels of peer interactions may likely to show more positive attitudes in online learning (Lee et al., 2011).

However, inconsistent results were identified in some studies concerning students' interactions with course interface, teachers, and other students. For example, higher levels of interactions with course interface, teachers, and peers may not always develop students' attitudes in a positive direction (e.g., Gunawardena et al., 2010).

It may not be sufficient to merely measure the frequency of online interactions, as the quality of interactions may possibly be more critical than the quantity (Lei, 2010; Lei & Zhao, 2007). Further research needs to examine students' experiences of different types of online interactions and how such experiences can contribute to their online learning attitudes by the end of the course. This study aimed to investigate students' online learning attitudes changes after taking a university blended course. The study also explore whether students with different levels of attitude changes would reveal different experiences during the course.

## 2. Research methodology

### *2.1 Participants and context*

The participants were 94 university students who undertook a 12-week blended course which aimed at providing the students with theories, research and practices in using information and communication technology (ICT) in learning and teaching. The course comprised traditional teaching (one-hour lecture and two-hour tutorial every week on campus) and online learning (online learning materials, participation in online discussion forum, communication by email, and application of ICT to facilitate the course tasks and assignments).

### *2.2 Procedures*

The research consisted of two phases: Phase One ── pre and post questionnaire surveys; and Phase Two ── interviews. The participants' attitudes toward online learning were measured by pre- and post-surveys at the beginning (T1) and the end of the course (T2) respectively. The design of Phase One aimed to examine whether there would be any significant differences in the participants' attitudes toward online learning between T1 and T2. At T1, 120 students originally participated in the pre-test. At T2, 94 of them completed post-test. There were eight participants taking part in the interviews.

The interviews in Phase Two followed Phase One to obtain more detailed and in-depth information about the interviewees' learning experiences to clarify the potential causes for the changes in their attitudes toward online learning. Approximately one month after the course was completed, 11 participants were approached for the interviews, as their online learning attitudes revealed marked changes based on the comparison of the participants' attitudes toward online learning from T1 to T2. Invitation letters were sent to the participants and eight of them agreed to participate in the interviews.

### *2.3 Instruments*

The questions tapping the participants' attitudes toward online learning remained the same from pre- to post-surveys in order to make comparison of students' attitudes across two occasions. The questions about the participants' attitudes toward online learning in the present study were adopted from several existing scales (Knowles & Kerkman, 2007; Robinson & Doverspike, 2006; Yudko, Hirokawa, & Chi, 2008). Based on the above research, the instruments about attitudes toward online learning in the present study addressed the participants' affective perception (likeness, interest, comfort, usefulness, confidence, anxiety, and perceived difficulty level), judgments, beliefs, and intention for future online learning. For all questions in this section, a four-point scale was used from "1= Strongly disagree" to "4 = Strongly agree", which will ensure that the responses provided by the participants can clearly represent their preferences in the attitudinal statements.

The interview consisted of questions about the participants' course participation, which included: (a) student-content interactions; (b) student-interface interactions (i.e., the participants' experiences of using various online learning components); (c) student-teacher interactions; and (d) peer interactions. The participants were probed to provide detailed information about their experiences of the above four types of interactions, such as which aspects of the interactions they liked, valued, did not like or did not valued and if they encountered any problems and how they solved the problems.

## 3. Results

### *3.1 Participants' attitude changes toward online learning*

Regarding the participants' online learning attitudes, 74% among them were above the mid-point at T1. At T2, 87% scored higher than the mid-point (Table 1). At the end of the course, the participants became more positive in terms of their attitudes toward online learning (Table 2).

Table 1: Descriptive Information: the Participants' Attitudes at T1

| Attitudes toward online learning | Mean | *SD* | Skewness | Kurtosis | Natural mid-point | Minimum | Maximum |
|---|---|---|---|---|---|---|---|
| Attitudes at T1 | 33.03 | 4.92 | -.68 | 1.83 | 30 | 15 | 48 |
| Attitudes at T2 | 34.83 | 4.75 | .09 | 1.43 | 30 | 20 | 48 |

*Notes.* (a) *n at T1*= 120, *n at T2*= 94 (b) Generalized attitudes at T1 represented 30 items from the 54 items in the other scales on all of the questionnaire-derived construct at the pretest level.

Table 2: Paired Samples T-test: Comparison of the Attitudes between T1 and T2

| | Possible maximum | Mean (*SD*) T1 | Mean (*SD*) T2 | *t* | *Sig.*(2-tailed) | Effect size |
|---|---|---|---|---|---|---|
| Online learning attitudes | 24 | 33.03 (4.4) | 34.83 (4.8) | 4.10 | .000** | 0.63 |

*Notes.* (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 for means testing on correlated samples (repeated measures).

### *3.2 Participants' intentions for future online learning*

Among the 94 participants, 15% claimed that "I would not study any course online" and 36% indicated that they were "not sure". Thirty percent would only study the subjects, with which they were familiar. The remaining (19%) would study any subjects online.

The participants mainly attributed their choice of "I will not study any course online" to (a) a preference for face-to-face interactions; (b) less motivation in online learning; and (c) a preference for hands-on practice.

The main reasons for the choice of "not sure" were stated as (a) a preference for face-to-face interactions; (b) depending on whether the subject was complex or whether the course was beneficial, and the course duration; (c) issues of asking for help or solving problems in online learning; (d) depending on personal commitment, time arrangement, and personal needs in learning; and (e) less motivation and engagement in online learning.

The most frequently stated reasons for choosing familiar subjects for online learning were "depending on my familiarity with the subject area and its difficulty level" and "convenience and flexibility of online learning".

Seventeen participants reported that they would take any subject online in the future and their reasons were mainly stated as (a) convenience and flexibility provided by online learning; (b) saving travel; and (c) prior positive online learning experiences.

### *3.3 Comparison between the Positive Change Group and the Contrast Group*

After completing the blended course, eight participants took part in the interviews. Four of them showed marked positive changes in their attitudes toward online learning and the other four did not display such changes. Therefore, the participants were divided into two groups — four in the Positive Change Group (PCG) and the other four in the Contrast Group (CG). The participants were asked about their experiences of several interactions during the course — interactions with online course content, the course interface, their teachers, and other peers.

Regarding the interactions with the online course content, the PCG participants reported more positively in the following themes: (a) perceived knowledge acquisition; (b) motivation in learning; and (c) a preference for learning to be driven by interests. The CG participants stated that they needed detailed information about the assessments and tended to attribute the failure in learning to a lack of prior experiences.

In regard to the interactions with the course interface, both PCG and CG participants appreciated the easy access to the well-designed course website. However, more participants from the PCG indicated that they used online forums effectively and liked hands-on practice on ICT tools. All participants stated that they had encountered technical problems, but more participants from the CG reported a lack of prior experiences of or interest in using ICTs.

Both PCG and CG participants highly valued the convenience of using email for the interactions with their teachers. However, more participants from the PCG commented on their experiences of interacting with their teachers positively, such as receiving timely and helpful response from the teachers through email and receiving encouragement and support from the teachers on the online forums. In contrast, more CG participants stated that they needed timely and more detailed responses from the teachers through email.

Regarding the face-to-face interactions with the teachers during tutorials, the participants from both PCG and CG positively commented on (a) immediacy through face-to-face interactions; (b) easiness for understanding; and (c) human factors. However, more participants from the PCG showed interest in the teachers' instruction. More CG participants revealed that they needed clear, detailed and consistent information from the teachers.

Concerning online peer interactions, more participants from the PCG indicated that online communication was convenient. They stated that they had frequent online communication, received timely responses and support from other students and had a larger group of recipients online. However, the CG participants reported lower levels of peer interactions and reluctance to ask questions on the online forums. Instead, two participants from the CG mentioned that they were more comfortable with using Facebook for peer interaction, as Facebook was a more relax environment with less supervision from the teachers.

With regard to face-to-face peer interactions, more participants from the PCG responded in the followings aspects: (a) frequent communication; (b) instant responses; (c) easiness for understanding; (d) support and help from other students; (e) perceived friendly learning environments in the tutorials; (f) human factors; and (g) smooth team work for group presentations.

Regarding the course experiences in general, more participants from the PCG concluded their experiences positively, such as (a) knowledge acquisition from the course; (b) liking to use online learning resources and tools; and (c) frequent online and offline interactions with their teachers and other students. On the other hand, the participants from the CG expressed some concerns, including (a)

lack of knowledge acquisition; (b) lack of interest in the subject area; (c) needing more help from the teachers; (d) feeling confused about the course assessments; and (e) a preference for hands-on work and learning from textbooks.

## 4. Discussion and conclusion

It was evident that there was a significant increase in the participants' attitudes toward online learning by the end of the course. It seemed that the experiences of completing the blended course possibly resulted in the positive changes in the participants' attitudes toward online learning. The reason may be that, by completing the course, the participants became more familiar with the subject area which was relevant to ICT usage, more competent in using different online learning resources and tools, and more capable of using the knowledge and skills learned from the course in their future teaching.

It has been found that an online or blended learning environment exposed students to the activities involving the usage of different online learning components, which not only contributed to the increase in the students' confidence in using technologies (Billings, Connors, & Skiba, 2001; Kenny, 2002), but also improves their course satisfaction and attitudes during learning (Friedman & Friedman, 2013; López-Pérez, Pérez-López, & Rodríguez-Ariza, 2011).

With regard to the interview results, the participants from the PCG showed more interest in the subject area, reported higher levels of course participation and knowledge acquisition, revealed higher levels of satisfaction with the interactions with their teachers and peers, and exhibited higher levels perceived learning outcomes. It was found that students' attitudes or satisfaction were closely related to their learning experiences, such as knowledge acquisition (Conrad & Donaldson, 2004), interactions and participation in learning (Lee et al., 2011; Paechter et al., 2010).

There is a need to point out that Facebook was used by some participants, who were not comfortable with online discussion forums in the course. As seen from the interview results, some participants claimed that they did not feel relaxed and comfortable to post inquiries to the online forums. Instead, the friendly environment on Facebook offered a quicker, freer, and more relaxing environment for them to interact with peers.

The main difference between the above two online communication platforms is whether it is supervised by teachers. Teachers' moderation in students' online interactions has been investigated, but inconsistent conclusions have been drawn. It was reported that teachers' moderation in students' online discussion was favored by students (Asterhan & Schwarz, 2010). However, others found negative relationships between teachers' moderation and students' participation in online discussion (Mazzolini & Maddison, 2003; McConnell, 1994; Pearson, 1999). Teachers' moderation in students' online discussion can be a vexed matter and it may be hard to reach a definite conclusion. Careful consideration needs to be taken on the design of online forum tasks to create a comfortable environment, which can facilitate students' interactions, develop their sense of community, and enhance their learning.

In conclusion, completing a blended course may contribute to students positive changes in their attitudes toward online learning. To further improve teaching quality, educators ought to design online or blended courses with careful consideration of students' needs and concern during learning process. Students' experiences of online interactions can be closely related to their course satisfaction. Well-design course content and interface, timely support and informative feedbacks from teachers and strong sense of community among students can positively impact students' learning experiences and attitudes.

## References


Arbaugh, J. B., & Benbunan-Fich, R. (2007). The importance of participant interaction in online environments. *Decision Support Systems*, *43*(3), 853-865.

Asterhan, C. S. C., & Schwarz, B. B. (2010). Online moderation of synchronous e-argumentation. *Computer-Supported Collaborative Learning*, *5*(3), 259-282.

Beffa-Negrini, P. A., Miller, B., & Cohen, N. L. (2002). Factors related to success and satisfaction in online learning. *Academic Exchange Quarterly*, *6*(3), 105-114.

Bruff, D. O., Fisher, D. H., McEwen, K. E., & Smith, B. E., (2013). Wrapping a MOOC: Student Perceptions of an Experiment in Blended Learning, *MERLOT Journal of Online Learning and Teaching*, Vol. 9, No. 2

Billings, D. M., Connors, H. R., & Skiba, D. J. (2001). Benchmarking best practices in Web-based nursing courses. *Advances in Nursing Science*, *23*(3), 41-52.
Choy, S., McNickle, C., & Clayton, B. (Eds.). (2003). *Learner expectations and experiences student views of support in online learning*. Adelaide: National Centre for Vocational Education Research Ltd.
Conrad, R. M., & Donaldson, J. A. (2004). *Engaging the online learner: Activities and resources for creative Instruction*. San Francisco, CA: John Wiley & Sons.
Friedman, L. W., & Friedman, H. H., (2013). Using Social Media Technologies to Enhance Online Learning, *Journal of Educators Online*, *10*(*1*).
Herrington, J., Oliver, R., & Reeves, T. C. (2003). Patterns of engagement in authentic online learning environments. *Australian Journal of Educational Technology*, *19*(1), 59-71.
Kenny, A. (2002). Online learning: Enhancing nurse education? *Journal of Advanced Nursing*, *38*(2), 127-135.
Kettanurak, V. H., K. Ramamurthy, & Haseman, W. D. (2001). User attitude as mediator of learning performance improvement in an interactive multimedia environment: An empirical investigation of the degree of interactivity and learning styles. *Int. J. Human-Computer Studies*, *54*(4), 541-583.
Gunawardena, C. N., Linder-VanBerschot , J. A., LaPointe, D. K., & & Rao, L. (2010). Predictors of Learner Satisfaction and Transfer of Learning in a Corporate Online Education Program. *American Journal of Distance Education*, *24*(4), 207-226.
Lee, M. J. W., & McLoughlin, C. (2011). *Web 2.0-based e-learning: Applying social informatics to tertiary teaching*. Hershey, PA: IGI Global.
Lee, S. J., Srinivasan, S., Trail, T., Lewis, D., & Lopez, S. (2011). Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning. *Internet and Higher Education*, *14*(3), 158-163.
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.
Lei, J. & Zhao, Y. (2007). Computer uses and student achievement: a longitudinal study. *Computers & Education*, *49*(2), 284–296.
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. R., & Haddock, G. (2009). The psychology of attitudes and attitude change. London: SAGE.
Mazzolini, M., & Maddison, S. (2003). Sage, guide or ghost? The effect of instructor intervention on student participation in online discussion forums. *Computers & Education*, *40*(3), 237-253.
McAlister, M. K., Rivera, J. C., & Hallam, S. F. (2001). Twelve important questions to answer before you offer a Web based curriculum. *Online Journal of Distance Learning Administration*, *IV*(II).
McConnell, D. (1994). Managing open learning in computer-supported collaborative learning environments. *Studies in Higher Education*, *19*(3), 341–359.
Milligan, C., Littlejohn, A., & Margaryan, A., (2013). Patterns of Engagement in Connectivist MOOCs, *MERLOT Journal of Online Learning and Teaching*, Vol. 9(2), p. 149-159
Oliver, R., & Omari, A. (2001). Student responses to collaborating and learning in a web-based environment. *Journal of Computer Assisted Learning*, *17*(1), 34-47.
Pearson, J. (1999). Electronic networking in initial teacher education: Is a virtual faculty of education possible? *Computer and Education*, *32*(3), 221-238.
Rovai, A. P. (2002). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *Internet and Higher Education*, *5*(4), 319-332.
Sharma, P. (2010). Key concepts in ELT: Blended learning. *English Language Teaching Journal*, *64*(4), 456-458.
Rajecki, D. W. (1990). *Attitudes*. Sunderland Massachusetts: Sinauer Associates.
Paechter, M., Maier, B., & Macher, D. (2010). Students' expectations of, and experiences in e-learning: Their relation to learning achievements and course satisfaction. *Journal Computers & Education*, *54*(1), 222-229.
Rodriguez, M. C., Ooms, A., & Montañez, M. (2008). Students' perceptions of online-learning quality given comfort, motivation, satisfaction, and experience. *Journal of Interactive Online Learning*, *7*(2), 105-125.
Russo, T., & Benson, S. (2005). Learning with invisible others: Perceptions of online presence and their relationship to cognitive and affective learning. *Educational Technology & Society*, *8*(1), 54-62.
Tu, C.-H., & Corry, M. (2003). Building active online interaction via collaborative learning community. *Computers in the Schools*, *20*(3), 51-59.
Waite, M., Mackness, J., Roberts, G., & Lovegrove, E., (2013). Liminal Participants and Skilled Orienteers: Learner Participation in a MOOC for New Lecturers, *MERLOT Journal of Online Learning and Teaching*, *9*(2).
Yuan, L., Powell, S., & Olivier, B. (2014). Beyond MOOCs: Sustainable online learning in institutions, published by Centre for Educational Technology, Interoperability and Standards http://publications.cetis.ac.uk/wp-content/uploads/2014/01/Beyond-MOOCs-Sustainable-Online-Learning-in-Institutions.pdf