Significant predictors for effectiveness of blended learning in a language course

Saovapa Wichadee

Bangkok University, Thailand
saovapa.w@bu.ac.th

A wide variety of technologies combined with traditional classroom methods can make learning easier in the digital age. This paper studied undergraduate students' learning performance and satisfaction after they had studied in a blended setting and investigated if variables of learner characteristics and course features would be predictors for effectiveness in a blended course. Data were gained from 149 students enrolled in a fundamental English course at a private university in Thailand, using a 5-rating scale questionnaire. The results of the study demonstrated that students were satisfied with instructor, interactivity and course design, and the mean score of performance was higher than the criterion. It was found that attitudes toward blended learning, face-to-face support and digital literacy were three variables predicting learning performance while only two variables including face-to-face support and attitudes toward blended learning were two predicting variables of satisfaction with the course. However, workload management and online learning tools quality were not predictors of learning performance and satisfaction with the course. When designing future blended courses, instructors should pay more attention to face-to-face support, attitudes toward blended learning and digital literacy since these factors may have an impact on the course success.

Keywords: blended learning, language learning, satisfaction, course effectiveness, course design

Introduction

With the development of educational technology, instructional provision in higher

Regular Paper

education has enormously been challenged and modified. Conventional methods of teaching are no longer suitable in serving a better quality education for students pursuing higher learning, thus, universities are integrating technologies in their mission to make teaching more innovative (DeNeui & Dodge, 2006; Orhan, 2008). Most of the higher educational institutions recognize that using technology can enhance students experience and knowledge. Researchers and educators have also made calls for universities to meet the social, economic, and technological challenges of the 21st century (Oblinger & Oblinger, 2005). The increases of technology-based and interdisciplinary learning experiences are in accordance with learning style of the current generation of students (Kvavik, 2005). To suit the needs of the 21st century learners and match their learning style preferences, blended learning is offering an innovative way that makes the learning process more effective and convenient.

Blended learning courses allow instructors to modify their conventional teaching techniques using innovative resources that enable them to create a more flexible instructional environment and provide a meaningful learning opportunity for students. It is giving learners and instructors a good chance to learn and teach more effectively. Blended learning is defined as "a way of meeting the challenges of tailoring learning and development to the needs of individuals by integrating the innovative and technological advances offered by online learning with the interaction and participation offered in the best of traditional learning" (Thorne, 2003). It is viewed as a mixture of face-to-face instruction and online learning, with the purpose of complementing each other. In a blended learning environment, a greater quality and quantity of interactions increase. Thus, the opportunity for learners to interact at anytime and anywhere has become wider due to the benefits that computer-mediated educational tools provide such as the use of social media that makes it easy for individuals to communicate regardless of time and location. Furthermore, online learning may include activities among learners, links to resources and downloadable text materials, online quizzes, and electronic submissions of assignments (Dabbagh & Bannan-Ritland, 2005). The use of online forums to promote active learning becomes a valuable experience because students are allowed to respond in thoughtful ways to questions and share ideas through discussions which stimulate their critical thinking (Krawiec, Salter, & Kay, 2005; Williams, 2006). Starkie (2007) validates that learning merged with innovations and collaborations bring out upheld, practical, learning surroundings. In blended learning, the collaboration of students and instructors improves the quality of teaching and learning. With such approach, remarkable relationships among blended teaching practices, student learning experiences, and high achievement are expected.

The design of blended learning in this study is in accordance with the improvement of innovative strategy to improve the instructional progression of learning in a private university in Thailand. It advanced a move from conventional face-to-face learning approach to blended learning approach that incorporated technology use in response to Thailand 4.0 policy. The new design for learning was extraordinarily provided to persuade students with individual differences to study according to their own pace and time.

Review of related literature

Effectiveness of blended learning

In the current study, effectiveness of blended learning was defined as satisfaction with the course and learning performance. Learner satisfaction was an indicator of effectiveness

of the designed course. According to Puzziferro (2008), the effective indicator of students' satisfaction from the designed course is measured on how often they participated more. When they often participate, they tend to be successful. Satisfaction was defined as how the students perceive that blended learning is an advantageous experience. Satisfaction informs how the course is accepted and valued, and it indicates the excellence of the learning experience. However, satisfaction is not just limited to content, but covers instructors and interaction happening amid the blended course. Interaction is vital for students' satisfaction as Eom, Wen, and Ashill (2006) claim. Graff (2003) states that since design has a considerable effect on how students move toward learning, it is important to find out whether the newly designed course really satisfies the students. Lin (2008) adds that when planned carefully, a blended course combined the leading highlights of in-class instruction with that of the best aspect of online learning surely encourage active student learning. Likewise, better format of the blended course can increase students' disclosure to course content, resulting in better academic performance (McFarlin, 2008). In addition, blended courses were found to increase flexibility in learning and engagement (Deschacht & Goeman, 2015; McFarlin, 2008). A study revealed that through coordinating with peers, students gain more knowledge (Klecker, 2007).

Another significant indicator of success to look at is academic results. Numerous studies on blended learning have revealed that blended learning can have positive and negative influences on academic performance. For instance, students gained higher proficiency as indicated in the studies done by Ladyshewsky (2004), Motteram (2006), Owstton, York, and Murtha (2013) while several findings have reported that students who failed to engage with the online activities or complete the online assignments tended to have lower proficiency (Chen & DeBoer, 2015; Pérez & Riveros, 2014) since self-motivation and the ability to work independently are vital to success in a blended learning environment. Learning performance in blended courses in some studies was reported to be the same as in traditional face-to-face courses (Delialioglu & Yildirim, 2009; Kwak, Menezes, & Sherwood, 2013). That is, students performed similarly well in blended learning as in traditional learning, and their academic achievement was not affected by the method used. In spite of the fact that our study did not look at the development of score as a marker of blended learning accomplishment, the potential of blended learning competence was considered from scores that our students attained in the course. Sixty points or above is considered a passing score.

Factors influencing the effectiveness of blended learning

Digital literacy, workload management, attitudes toward blended learning, online tools quality and face-to-face support are found to be some of those numerous factors for blended learning success based on literature reviews

The first factor to be considered is digital literacy. As technology has been an integrated element of blended learning, having access to websites, reading e-journals or e-books, doing online tests and others changes the way students learn (Jones, Ramanau, Cross, & Healing, 2010). In this respect, students are assumed to be good at using technology for learning. Even though they use technology in their everyday activities, they may not attain certain level of digital literacy. As Gilsters (1997) mentions in his work on digital literacy, to be digitally literate, an individual must accomplish four center competencies to be successful: web searching, hypertext navigation, gathering information, and content evaluation. In a study conducted by Tang and Chaw (2016), it was found that students who are digitally **27**

literate will be effective in a technology-supported learning environment. Another study indicates that the respondents identify the lack of knowledge as the common factor affecting the use of digital technologies for language learning (Son, Park, & Park, 2017). Lin and Vassar (2009) add that students' capacity to cope with technical difficulty, adequate skills in computer operations and internet searching are indicative of students' success. For instance, failure in blended learning is because of a lack of computer skills (Sharaim & Khlaif, 2010).

Workload management is another factor that should be taken into account. As workload is a vital part of the success in blended learning, it is necessary to examine how students manage various responsibilities that they take in the course. According to Jones (1995), too much workload may influence their stress levels which lead to diversion from studies. In the same vein, cognitive load theory recommends that overloading working memory with high cognitive loads adversely influences learners (Sweller, Van Merrienboer, & Paas, 1998). Excessive knowledge in the learning environment does not provide benefits to learning, and causes redundant cognitive load in the learning environment. In this regard, working on numerous assignments or too complicated work may be accepted only by those with good management skills. Therefore, students with good workload management will have a pleasant experience and gain higher score. This theory is supported by the survey conducted by Kintu and Zhu (2016), indicating that management of workload is a key factor to learner satisfaction.

When something new is actualized in the teaching procedure, having a right attitude is similarly vital. Bad attitudes toward blended learning can have a negative effect. One of the elements that measure students' success is their optimistic outlooks towards blended learning (Selim (2007). In addition, attitudes toward blended learning were found to be a significant factor of satisfaction in many studies (Kintu & Zhu, 2016; Kintu, Zhu, & Kagambe, 2017). To support the significance of the states of mind, Owston, York, and Murtha (2013) discovered in the study that perceptions ccould influence the course grade. That is, students who were high-achieving had more positive attitudes asserting that the course was additionally convenient, more engaging, and their learning was enhanced. According to previous studies, the blended classes conveyed more active and profound learning when they were compared to the conventional classes (Donnely, 2010; Woltering, Herrler, Spitzer, & Spreckelsen, 2009).

Among success factors for blended learning, the quality of online tools and face-to-face support should be considered as well. According to Song, Singleton, Hill, and Koh (2004), online learners who are challenged by technical difficulty with regard to the course design do not demonstrate effective learning. Technology not only affects the learning performance of the students, it also influences their satisfaction in blended learning (Bower & Kamata, 2000; Naaj, Nachouki, & Ankit, 2012). In this type of learning environment, face-to-face support is as important as technology quality. As Kintu et al. (2017) put up, both technology quality and support in face-to-face environments are tentative predictors of learner satisfaction.

To succeed in the course, it is essential to obtain feedback from students, which may shed light on the appropriate proportion regarding online and face-to-face components. The current study aimed to examine if the blended approach was as an efficient or pleasant way of learning, and find out certain factors that were directly connected to the effectiveness of learning in a blended course. Effectiveness of blended learning in this study was evaluated from two variables: learning performance and satisfaction. The findings will be valuable for concerned instructors and educators as they will provide useful information

and guidelines for better course management. For instance, the factors which are found to be correlated to students' academic success and satisfaction should be considered seriously when redesigning blended courses in the future. So, obstacles can be prevented before the blended courses begin. Raising awareness about problems helps to provide more effective instruction. The four research questions guide the investigation of this study.

1. What are the students' attitudes toward blended learning, workload management, and digital literacy?
2. What are the students' perceptions of online tools quality and face-to-face support in a blended learning course?
3. What are the significant predictors of learning performance?
4. What are the significant predictors of satisfaction with blended learning course?

Theoretical framework

A theory of learning that is the most suitable for the digital age is called "connectivism" created by George Siemens (2004, 2005). Connectivism which is a combination of existing learning theories, social structures, and technology can generate an effective model for better learning in the digital age. The theory is in accordance with the learning trends in the twenty first century when technologies become a vital part of daily life. The use of technology and networks has a significant role to play in acquiring knowledge. When new learning tools are employed, people change the way they learn and acquire knowledge. Only the right people can connect knowledge that is in a database and be able to learn it well. Connectivism can address the challenges of knowledge management. Therefore, the current study employed connectivism as a theoretical framework to conduct the study.
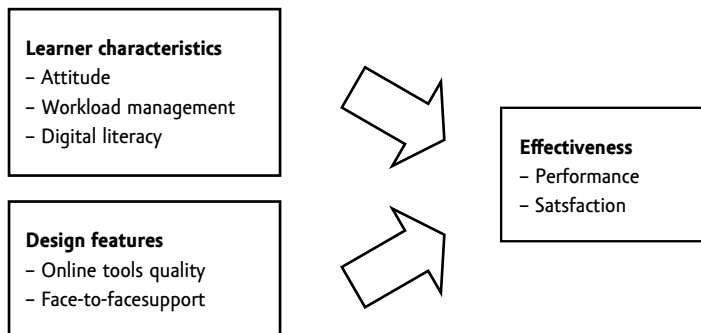

Learner characteristics
– Attitude
– Workload management
– Digital literacy

Design features
– Online tools quality
– Face-to-facesupport

Effectiveness
– Performance
– Satsfaction

Figure 1. Conceptual model of the present study

Methodology

Participants

The research emphasized the use of blended learning in an English course. This study took place at a private university in Thailand during August to December, 2016 when an English course was adjusted to incorporate educational technology in it. It was a 3-unit credit course which was usually taken by first-year students from different fields of study. **29**

The purposive sampling method was employed with the criterion that these classes were a case study of new method. One hundred forty-nine freshmen who were taking the blended course became participants. There were 90 females and 59 males. All participants agreed to take part in this study, and they signed a consent form.

Course design

In order to improve a suitable blended format, the previous course syllabus was redesigned to include both online and in-class contents. Even though there are a variety of forms that produce blended learning with the use of technologies, this study utilized the pattern of one week of orientation lecture, six weeks in online, six weeks in class, and one week for the online test. Details are presented in the following schedule.

Week	Type of learning
1	course orientation (big class made up from many sections)
2, 4, 6, 8, 10, 12	face-to-face meetings in a classroom
3, 5, 7, 9, 11	online self-study (OCW, Speexx, Touchstone)
13, 14	reviewing lessons and doing an online exam in the language lab

For online instructions, there are three learning platforms which are OCW, Touchstone Online Learning and Speexx. Each platform provides 10 points for students to gain. The first platform is OCW. OCW stands for Open Courseware. It is a digital publication created by our university with an aim to provide necessary learning materials for students. Each student has to visit http://ocw.bu.ac.th and follow the learning instructions for each period before coming to class in the following week. The learning materials on OCW include introduction sheets, wrap-up video clips, OCW quizzes, what to prepare for next class, and supplementary resources. Also, students have to complete 5 OCW quizzes, one for each period. Each quiz is worth 2 points. The second platform is Touchstone Online Learning. In this platform, students are required to complete the online exercises from www.cambridgelms.org/main. In order to get full score, students have to complete both Course and Workbook exercises on time. The last platform is Speexx which is an online language training and testing program. Students can practice and test their English language skills through this program. Before and after Speexx practice, students have to take the pre- and post-test to ensure the skills development. The total score is 10.

Face-to-face is the traditional learning approach. The students have to come to study in class as usual. Instructors emphasize the important content and students do group assignments during this time. There are five assignments; one is individual work and the remaining assignments consist of group work. Each assignment is worth 10 points. So, there are 50 points for in-class assignments. Each week students have to visit OCW before coming to class, so they are able to know in advance what they are going to prepare and learn in class. These in-class assignments aim to improve four main skills (reading, speaking, writing and listening). Hence, in weeks 2, 4, 6, 8, 10, and 12, students have to be in the classroom. On week 14, all students have to take the online final exam comprising three main parts: reading, vocabulary, and grammar. There are 60 items in form of multiple choices. The scores for the exam are 20 points.

Research instruments

Data were collected by two instruments. The first instrument was scoring rubrics used for evaluating student learning performance. The learning success was measured from in-class and online assignments as well as online exam. The total score for grading in this course was 100.

Activities	Score	Platform
In-class assignments	50%	Classroom
Online exam	20%	Language laboratory
Self-study language exercises (Speexx)	10%	http://speexx.co.th/bu/
Touchstone online learning	10%	www.cambridgelms.org/main
OpenCourseware (OCW) quizzes	10%	http://ocw.bu.ac.th
Total	**100%**	

The current study also employed a questionnaire with four main parts to collect data. The first part investigated learner characteristics comprising attitude toward blended learning (8 items), workload management (4 items), and digital literacy (9 items). More specifically, the researchers adopted the digital literacy part from the study conducted by Tang and Shaw (2016) since it was considered to be very effective for assessment of abilities to use technology in learning. The second part investigated students' satisfaction with the blended course in order to learn how much the students accepted the course. The satisfaction part which contained 13 items was divided into three categories: content, instructor, and interaction. The last part investigated how they perceived design features in terms of the quality of learning tools (3 items) and face-to-face support (3 items). Students were asked to respond to the questions provided in a five rating scale (1= strongly disagree to 5 = strongly agree).

Content validity and reliability of the questionnaire

To ensure content validity of the questionnaire, the draft was reviewed by three colleagues in the Language Institute. Several items were improved and changed based on their suggestions. Regarding the reliability, the questionnaire was pilot-tested with 40 non-subject students. All parts containing the Likert scales items were calculated for determining an internal consistency using the coefficient alpha technique. The findings confirmed that all parts in the questionnaire were acceptable because they contained a high coefficient alpha with reliability values between 0.72 and 0.89. Therefore, the questionnaire could be used to collect data from the participants.

Data analysis

Data were collected from students using the questionnaire. Mean and standard deviations were employed to analyze the quantitative data and interpreted based on the scores. The responses in all parts were in form of 5 rating scales rating from strongly disagree to strongly agree. The Likert scale was divided into five ranges to which meanings were assigned as follows:

Table 1. Likert scale breakdown

Likert scale range	Meaning
4.51–5.00	Very positive / very high
3.51–4.50	Positive / high
2.51– 3.50	Average
1.51–2.50	Negative / low
1.00–1.50	Very Negative / very low

Pearson Correlation Coefficients were used to study several factors in relation to students' learning scores and satisfaction with the course. Then multiple linear regression analysis was done to find out the factors which were significant predictors of effectiveness of the blended language course.

Research findings

Research question 1. What are the students' attitudes toward blended learning, workload management, and digital literacy?

Table 2 demonstrates that students had positive attitudes toward blended learning (Mean = 3.58). When considering all items, it was found that they rated three items at high levels. These included convenience, learning freedom, and having more responsibility in learning. However, language skills improvement was rated the least among all items (Mean = 3.38).

Table 2. Mean and standard deviation of students' attitudes toward blended learning

Statement	Mean	SD	Level
1. Blended learning encouraged students to have responsibility in learning.	3.55	1.05	positive
2. Blended learning promoted active learning.	3.48	1.06	average
3. Blended learning made the class interesting.	3.47	1.17	average
4. Blended learning promoted freedom in learning.	3.78	1.08	positive
5. Blended learning helped improve language skills.	3.38	1.16	average
6. Blended learning provided a good learning experience.	3.48	1.11	average
7. Blended learning made students have more convenience.	3.96	1.03	positive
Total	**3.58**	**.95**	**positive**

Table 3 shows that the overall mean score of workload management was at a high level (Mean = 3.66). Interestingly, although Touchstone online exercises were rated the highest with a mean of 3.75, the other three items were not much different. That is, students rated their management of workload as high in all items.

Table 3. Mean and standard deviation of workload management

Statement	Mean	SD	Level
1. Tasks assigned in the classroom sessions	3.64	.75	high
2. Touchstone online exercises	3.75	.90	high
3. Self-study and quizzes in ocw.bu.ac.th	3.57	.84	high
4. Practice and test in SPEEXX	3.66	.86	high
Total	**3.66**	**.66**	**high**

Table 4 shows that students had a high level of digital literacy (Mean = 3.69). Among nine items, item no.7 gained the highest score (using digital technology often both at home and at university, Mean = 4.03), followed by item no. 9 (having the skills to use digital technology effectively, Mean = 3.99). While eight items were rated as high, there was only one item with average level of rating (being motivated in learning new information online, Mean = 3.48).

Table 4. Mean and standard deviation of students' digital literacy

Statement	Mean	SD	Level
1. I am motivated in learning new information online.	3.48	1.02	average
2. I can evaluate the information that I gather for its usefulness.	3.52	.96	high
3. I can integrate information that comes from different online sources.	3.54	.90	high
4. I know how and where to search for useful information online.	3.64	1.01	high
5. I am able to apply the material that I have learned.	3.72	.97	high
6. I am able to evaluate the quality of information that I receive.	3.54	.83	high
7. I use digital technology often both at home and at university.	4.03	.95	high
8. I am confident in using application software such as email, web browser.	3.72	.88	high
9. I have the skills to use digital technology such as computer, smartphone, tablet effectively.	3.99	.94	high
Total	**3.69**	**.74**	**high**

Research question 2. What are the students' perceptions of online tools quality and face-to-face support in a blended learning course?

Table 5 indicates that students had overall perceptions of quality of online tools at a high level. However, when three online platforms were compared, the website (ocw.bu.ac.th) created by the Computer Center was rated as the least qualified online tool at an average level. Regarding the category of face-to-face support, they perceived all items at high levels. That is, the design of face-to-face meetings was suitable.

Table 5. Students' perceptions of online tools quality and face-to-face support

Online tools quality	Mean	SD	Level
1. Touchstone online exercises	3.63	.90	high
2. ocw.bu.ac.th	3.40	1.01	average
3. SPEEXX	3.60	.99	high
Total	**3.54**	**.83**	**high**

Face-to-face support	Mean	SD	Level
1. frequency of face-to-face meetings (6 times per course)	3.86	.87	high
2. amount of time in each meeting (2.20 hours)	3.79	.86	high
3. duration set between meetings (every two weeks)	3.60	.81	high
Total	**3.75**	**.67**	**high**

In order to evaluate students' academic performance, the scores obtained from online quizzes, online exercises completion, in-class assignments, and final exam were taken to analyze. It was found that 149 students had the average score of 62.83 from 100 with standard deviation of 13.63. The maximum score was 88 and the minimum score was 22. The criterion of passing the grade was 60 points. The finding of one sample t-test analysis was rather satisfactory since the mean score of 62.83 was higher than the criterion at the significance level of .05.

Table 6. The result of learning achievement

n	Mean	SD	Maximum	Minimum	Criteria	t	p
149	62.83	13.63	88	22	60	2.530	.012

Table 7 shows that the overall mean score of students' satisfaction with the blended English course was at a high level (Mean = 3.66). When looking at detail, it was found that the mean scores of satisfaction were at high levels in nearly all items. Only two items in the category of satisfaction with the course design were rated at average levels. That is, students were moderately satisfied with the design of online part (Mean = 3.44) and the accordance of content in face-to-face and online parts (Mean = 3.50). It is interesting to see that the three highest mean scores of satisfaction were under the category of instructor, including item no. 9 (the ability to handle technology, Mean = 3.86), item no. 7 (communication about class assignments, Mean = 3.85), and item no. 10 respectively (explanation of the contents, Mean = 3.81).

Table 7. Students' satisfaction with blended course

Satisfaction with the course design	Mean	SD	Level
1. The design of face-to-face part is suitable for me to learn the content.	3.64	.92	high
2. The design of online part is appropriate.	3.44	.99	average
3. The content in face-to-face part is related to that in the online part, which helps me increase understandings.	3.50	.93	average
4. Evaluation criteria for each assignment are clear.	3.67	.93	high
5. Duration of doing each assignment is appropriate.	3.51	1.01	high
6. Online learning platforms chosen for the course are effective.	3.59	.96	high
Satisfaction with instructor			
7. Class assignments are clearly communicated to me.	3.85	.87	high
8. Feedback on assignments is given in a timely manner.	3.79	.86	high
9. The instructor is able to use blended learning technology well.	3.86	.87	high
10. The instructor is able to explain the contents clearly.	3.81	.91	high
Satisfaction with interactivity			
11. Interaction is adequately maintained with the instructor both in face-to-face and online sessions.	3.77	.94	high
12. I am satisfied with the way I interact with other students.	3.64	.93	high
13. I am satisfied with the process of collaboration in groups to complete the given tasks.	3.57	.89	high
Total	**3.66**	**.69**	**high**

Research question 3. What are the significant predictors of students' learning performance?

This study was conducted to examine the factors that contributed to students' learning performance. In this regard, student success was measured by the total points earned out of 100. The results revealed that the mean score was equal to 62.83 with standard deviation of 13.63. Pearson correlation analyses were conducted to assess factors which related their learning performance in the blended course. Findings revealed that student learning achievement was positively correlated with three factors comprising attitudes toward blended learning ($r = .664$, $p < .01$), digital literacy ($r = .628$, $p < .01$) and face-to-face support ($r = .588$, $p < .01$). That is, the more students had positive attitudes, digital literacy, and face-to-face support, the better they had learning performance. It was interesting to see that workload management and perceptions on online tools quality were not related to their learning scores.

After that, linear regression (stepwise method) was employed to find out the factors that could be predictors of learning performance. In this regard, the three factors comprising attitude toward blended learning, digital literacy, and face-to-face support were entered into the regression equation as independent variables. Then it was found that three variables could be significant predictors of learning performance, $F = 61.591$, $p < .01$, $R2 = .560$. This means that the three significant predictor variables accounted for 56 % of the variance. The equation is as follows: $\hat{y} = 5.953 + 3.617 (X1) + 6.377 (X2) + 5.469 (X3)$

Table 8. Significant predictors of learning performance

Independent variables	Unstandardized coefficients		Standardized coefficients		
	B	Std.Error	Beta	t-value	p-value
(Constant)	5.953	4.650		1.280	.203
Attitudes toward blended learning	5.469	1.145	.380	4.775	.000
F2F support	6.377	1.318	.314	4.838	.000
Digital literacy	3.617	1.510	.197	2.396	.018

R =.749   R2 =.560   F = 61.591   P < .01

Research question 4. What are the significant predictors of satisfaction with blended learning course?

Apart from learning performance, this study also focused on learner satisfaction. Therefore, Pearson correlation coefficients were investigated to find out any relationships between satisfaction and five factors. The results showed that satisfaction with the blended course was positively related to all factors including attitudes toward blended learning (r = .764, p < .01), digital literacy (r = .678, p < .01), workload management (r = .356, p < .01), online tools quality, (r = .271, p < .01), and face-to-face support (r = .784, p < .01). Then multiple regression analysis was further conducted to examine whether these factors are significant in predicting their satisfaction using stepwise method. Finally, it was found that only two factors including face-to-face support and attitudes toward blended learning were statistically significant predictors to satisfaction with the course (F = 338.665, p < .01) while the factors of digital literacy, workload management, and online tools quality were excluded from the equation. The adjusted R square was .823. This means that the two significant predicting variables accounted for 82.3 % of the variance. The equation is presented as follows: $\hat{y}$ = 0.213 + 0.373 (X1) + 0.564 (X2)

Table 9. Significant predictors of satisfaction

Independent variables	Unstandardized coefficients		Standardized coefficients		
	B	Std. Error	Beta	t-value	p-value
(Constant)	.213	.140		1.516	.132
F2F support	.564	.040	.549	14.016	.000
Attitudes toward blended learning	.373	.028	.513	13.098	.000

R = .907   R2 = .823   F = 338.665   P < .01

Discussion

The current study investigated the effectiveness of blended learning in a fundamental English course in two aspects: learning performance and satisfaction. It also examined potential factors that could be used to predict effectiveness of blended learning. All of the

quantitative data were analyzed to gain a clear picture of how the integrated learning environment affected the students and what factors contributed to their success. The findings can be discussed as follows:

The first issue is highlighted on students' high level of satisfaction with blended course with regard to three components: course design, instructor, and interactivity. This reflects a good evaluation of the quality in all aspects. Satisfaction is important since it can enhance students' exposure to course content (McFarlin, 2008). There are two reasons which can be used to explain their satisfaction. First, their learning needs were met, and the course did not cause a big burden throughout the semester. All instructors responsible for the blended course placed a lot of importance on how they could interact and communicate with students. In case of problems, students could contact their instructor immediately to get a solution. That is the reason why this course was designed to focus not only on course features, but also instructor and interactivity. Second, students probably found the present course more motivating than the previous one, so they expressed their satisfaction at a high level. This can be supported by the conversation made by many students through LINE chats, agreeing that the online platforms enabled them to gain knowledge more easily. They mentioned that blended learning was a new and exciting experience since the knowledge that they gained in online weeks would be checked when face-to-face classes came. If they did not study enough before class, they would not get good points in doing in-class assignments. However, it is interesting to see that students were satisfied with two items under the course design at moderate levels. Hence, the issues of the appropriateness of design in online part and accordance of the content in face-to-face and the online parts should be further investigated. The information will be useful for the future course adjustment.

The next issue to be discussed is learner characteristics comprising attitudes toward blended learning, digital literacy and workload management. All these factors were rated overall at high levels. In general, digital literacy and workload management at high levels can have a good influence on attitudes. That is why they had positive attitudes toward blended learning. However, among all items of attitude factor, four items were rated as average. This is probably because students were not accustomed to doing considerable online lessons and quizzes. They might not be confident in working on their own without instructor. It is noticed that they always raised questions through LINE and email about the online part. Results from students' assessment of the course indicated that some students felt uncomfortable when they had to work alone. Some stated that there were too many video clips to watch before taking quizzes, and the questions were rather difficult. Moreover, in a blended learning environment, students need to have more self-discipline. Even though blended learning offered flexibility in learning and they could have access to content and assignments anywhere and anytime, the three websites that they had to work on during online weeks became increased responsibility. So, they might not feel much comfortable.

An investigation of digital literacy showed that students seemed to have no problems with technology usage in the learning process and be ready to learn online since they expressed a high level of digital literacy. This indicated that students were likely to have no problems when they used educational technologies provided in the course. This is probably because they have been familiar with technological tools used for learning activities such as reading e-books, sending emails, accessing learning management systems, doing online quizzes, and participating in discussion forums. In addition, many courses at our university have been redesigned to enhance students' digital literacy skills for quite some time. Unsurprisingly, the score results were rather satisfactory. The findings can be **37**

supported by the study by Picciano and Seaman (2007) revealing that blended learning was highly dependent on experience in Internet and computer applications. Lin and Vassar (2009) similarly found that learner success depended on ability in computer operations and Internet navigation.

This study also placed a lot of importance on workload management. It is necessary to see how much students could handle all assignments and online activities. The findings were found to be satisfactory since they had a high level of workload management. This indicated that they could adjust themselves to the new learning design very quickly. Although they might dislike what they had to do outside class, they agreed to complete them in order to earn good points. This is probably because on the first week of orientation, they were already informed of score allocation based on the course syllabus and how to learn successfully. Students perceived the increased responsibility for their learning. Therefore, even students without good workload management skills still achieved high scores. This phenomenon could explain why the factor of workload management was not related to students learning achievement. Moreover, workload management had nothing to do with satisfaction with the course. Students who were satisfied with the course might not have good workload management skills. This is probably because students knew that it was their fault to postpone doing online exercises to last week. They agreed to be more tired at the end, but they had more time to spend on other things during online weeks that they were away from class. The current finding is, therefore, different from the survey conducted by Kintu and Zhu (2016) who found that workload management is a key factor to learner satisfaction.

Regarding significant predictors found in this study, attitudes toward blended learning, face-to-face support and digital literacy could be used to predict students' learning performance. These three factors were found to be positively correlated with the scores earned. In designing the course, these factors should be seriously considered. Firstly, the findings revealed that student learning performance was correlated with the level of digital literacy. The more students were digitally literate, the higher scores they gained. This is due to the fact that blended learning combines the face-to-face and online parts, so those whose technological skills were good tended to have fewer problems when doing assignments on websites. In this regard, digital literacy should not be overlooked since learner success depends on the ability to deal with technical difficulty and the ability to surf internet (Lin & Vassar, 2009). Secondly, the more they had positive attitudes toward blended learning, the more they gained higher scores. Therefore, learners should have positive attitudes toward learning before the course starts since bad attitudes can affect grades (Owston *et al.*, 2013). In this study, the details of blended learning were communicated in ways that led to understandings. Lastly, there was a great influence by face-to-face support towards learning performance. This is probably because meeting their peers and instructors in class adequately enabled them to follow up the missing points or update information needed. A good support that a good arrangement of face-to-face meetings is beneficial comes from McFarlin's study, which found that the blended course format could increase students' involvement with the content, thereby improving their academic performance if it is suitably designed (McFarlin, 2008). The finding was found to be the same as those in many studies in that face-to-face support can influence the learner performance (Bower & Kamata, 2008; Naaj *et al.*, 2012).

The last discussion is on two factors, namely face-to-face support and attitudes towards

38 blended learning, which influenced learner satisfaction with the course. The reasons why

face-to-face support and attitudes toward blended learning are two predictors of satisfaction in this study can be explained by two reasons. The first reason is that students had no experience in blended learning. Even though the course provided more convenience in some ways like not coming to class every week, it could also be claimed that it sometimes caused inconvenience; for example, by having to work on something outside of class without immediate help from the instructor caused them problems. Previous studies can maintain this assumption since they revealed that face-to-face support is still important in blended learning (Bower & Kamata, 2008; Kintu *et al.*, 2017; Naaj *et al.*, 2012). Secondly, attitudes had, in the same vein, a strong influence on satisfaction with the course. In order to avoid problems, instructors of this course tried to facilitate students throughout the course. For instance, they provided an orientation on the first week to explain about blended learning and how they would learn. During the course, there was a channel to raise questions called "chat center" using LINE and Google hangout, and answers were given by a team of faculty staff. Students could also contact their own instructor by email. Generally, when problems could be solved, they seemed to be satisfied. This is probably a reason why they had positive attitudes toward blended learning although it was a new method. In conclusion, as found in many studies (Kintu & Zhu, 2016; Kintu *et al.*, 2017), a high level of satisfaction with the course can be a result from positive attitudes.

References

Bower, B. L., & Kamata, A. (2000). Factors influencing student satisfaction with online courses. *Academic Exchange Quarterly, 4*(3), 52–56.

Chen, X., & DeBoer, J. (2015). Checkable answers: Understanding student behaviors with instant feedback in a blended learning class. IEEE Frontiers in Education Conference (FIE) (pp. 1–5). Retrieved from http://doi.ieeecomputersociety.org/10.1109/FIE.2015.7344045

Dabbagh, N., & Bannan-Ritland, B. (2005). *Online learning: Concepts, strategies, and application.* New Jersey: Pearson Education, Inc.

Delialioglu, O., & Yildirim, Z. (2009). Design and development of a technology enhanced hybrid instruction based on MOLTA: Its effectiveness in comparison to traditional instruction. *Computers & Education, 5*(1), 474–483.

DeNeui, D, & Dodge, T. (2008). Asynchronous learning networks and student outcomes: The utility of online learning components in hybrid courses. *Journal of Instructional Psychology, 33* (4), 256–259.

Deschacht, N., & Goeman, K. (2015). The effect of blended learning on course persistence and performance of adult learners: A difference-in-differences analysis. *Computers & Education, 87,* 83–89.

Donnelly, R. (2010). Harmonizing technology with interaction in blended problem-based learning. *Computers & Education, 54* (2), 350–359.

Eom, S. B., Wen, H. J., & Ashill, N. (2006). The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation. *Decision Sciences Journal of Innovative Education, 4 (2),* 215–235.

Gilster, P. (1997). *Digital literacy.* New York, NY: Wiley Computer Publishing.

Graff, M. (2003). Learning from web-based instructional systems and cognitive style. *British Journal of Education Technology, 34* (4), 407–418.

Jones, C., Ramanau, R., Cross, S., & Healing, G. (2010). Net generation or digital natives: Is there a distinct new generation entering university? *Computer & Education, 54,* 722–732.

Jones, G. (1995). More than just a game: Research developments and issues in competitive anxiety in sport. *British Journal of Psychology, 86,* 449–478.

Kintu, M. J., & Zhu, C. (2016). Student characteristics and learning outcomes in a blended learning environment intervention in a Ugandan university. *The Electronic Journal of e-Learning, 14* (3), 181–195.

Kintu, M. J., Zhu, C., & Kagambe, E. (2017). Blended learning effectiveness: The relationship between student characteristics, design features and outcomes. *International Journal of Educational Technology in Higher Education, 14* (7), 1–20.

Klecker, B. (2007). The impact of formative feedback on student learning in an online classroom. *Journal of Instructional Psychology, 34* (3), 161–165.

Krawiec, S., Salter, D., & Kay, E. (2005). A hybrid bacteriology course: The professor's design and expectations; the students' performance and assessment. *Microbiology Education, 6,* 8–13.

Kvavik, R. B. (2005). Convenience, communications, and control: How students use technology. In D. G. Oblinger & J. L. Oblinger (Eds.), *Educating the Net generation* (pp. 7.1–7.20) Washington, DC: Educause.

Kwak, D. W., Menezes, F. M., & Sherwood, C. (2013). Assessing the impact of blended learning on student performance. *Educational Technology & Society, 15* (1), 127–136.

Ladyshewsky, R. K. (2004). E-learning compared with the face to face: Differences in the academic achievement of postgraduate business students. *Australasian Journal of Educational Technology, 20* (3), 316–336.

Lin, Q. (2008). Student satisfactions in four mixed courses in elementary teacher education program. *Internet and Higher Education, 11* (1), 53–59.

Lin, B., & Vassar, J. A. (2009). Determinants for success in online learning communities. *International Journal of Web-based Communities, 5* (3), 340–350.

McFarlin, B. K. (2008). Hybrid lecture-online format increases student grades in undergraduate exercise physiology course at a large urban university. *Advances in Physiology Education, 32,* 86–91.

Motteram, G. (2006). Blended education and the transformation of teachers: A long-term case study in postgraduate UK higher education. *British Journal of Educational Technology, 37* (1), 17–30.

Naaj, M. A., Nachouki, M., & Ankit, A. (2012). Evaluating student satisfaction with blended learning in a gender-segregated environment. *Journal of Information Technology Education: Research, 11,* 185–200.

Oblinger, J. L. Oblinger (Eds.). (2005). *Educating the Net generation.* Washington, DC: Educause.

Orhan, F. (2008). Redesigning a course for blended learning environment. *Turkish Online Journal of Distance Education, 9* (1), 54–66.

Owston, R., York, D., & Murtha, S. (2013). Students perceptions and achievement in a university blended learning strategic initiative. *Internet and Higher Education, 18,* 38–46.

Pérez, D. P., & Riveros, R. M. (2014). Unleashing the power of blended learning and flipped classroom for English as Foreign Language learning: Three spheres of challenges and strategies in a Higher Education Institution in Colombia. Paper presented at the 7th International Conference of Education, Research and Innovation (ICERI) 2014, Seville, Spain. Retrieved from https://library.iated.org/view/pARRApEREZ2014uNL

Picciano, A., & Seaman, J. (2007). *K-12 online learning: A survey of US school district administrators.* New York: Sloan-C.

Puzziferro, M. (2008). Online technologies self-efficacy and self-regulated learning as predictors of final grade and satisfaction in college-level online courses. *The American Journal of Distance Education, 22* (2), 72–89.

Selim, H. M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers & Education, 49* (2), 396–413.

Shraim, K., & Khlaif, Z. N. (2010). An e-learning approach to secondary education in Palestine: opportunities and challenges. *Information Technology for Development, 16* (3), 159–173.

Siemens, G. (2004). A learning theory for the digital age. Retrieved from http://www.elearnspace.org/articles/connectivism.htm

Siemens, G. (2005, January). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology & Distance Learning.* Retrieved from http://www.itdl.org/Journal/Jan_05/article01.htm

Song, J., Park, S., & Park, M. (2017). Digital literacy of language learners in two different contexts. *JALT CALL Journal, 13*(2), 77–96.

Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: student perceptions of useful and challenging characteristics. *Internet and Higher Education, 7* (1), 59–70.

Starkie, E. G. (2007). The Practicum: An Example of Changes in the Teaching and Learning Process in the European Higher Education Space. *Odgojne znanosti, 9* (1), 119–135.

Sweller, J., Van Merrienboer, J. G., & Paas, F. G. (1998). Cognitive architecture and instructional design. *Educational Psychology Review, 10* (3), 251–296.

Tang, C. M., & Chaw, L. Y. (2016). Digital literacy: A prerequisite for effective learning in a blended learning environment? *The Electronic Journal of e-Learning, 4* (1), 54–65.

Thorne, K. (2003). *Blended learning: How to integrate online and traditional learning.* London: Kogan Page.

Williams, K. (2006). Active learning and quality in online courses. *NACTA Journal, 50* (4), 11–14.

Woltering, V., Herrler, A., Spitzer, K. & Spreckelsen, C. (2009). Blended learning positively affects students' satisfaction and the role of the tutor in the problem-based learning process: Results of a mixed-method evaluation. *Advances in Health Science Education, 14*(5), 725–738.

Author biodata

Saovapa Wichadee is an Associate Professor in the field of English language teaching at the Language Institute, Bangkok University, Thailand. She is involved in curriculum development. Her areas of specialization include computer-assisted language learning, the use of

social media in language teaching, and language teacher development. Her recent publications have focused on different types of blended learning.