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Design principles for the blend in blended learning: a collective case study

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ABSTRACT

This paper reports on a collective case study of three blended courses taught by different instructors in a higher education institution, with the purpose of identifying the different types of blend and how the blend supports student learning. Based on the instructors' and students' interviews, and document analysis of course outlines, two major principles, consolidation and extension, differentiating the design of the three courses, are identified. The consolidation principle emphasises designing different types of activities for students to think again, so that their knowledge can be consolidated. The extension principle emphasises the extension of the space of learning and catering the diverse needs of students. There are also design principles commonly found, with the emphases on student autonomy, interaction and feedback, and the awareness of student diversity. The findings contribute to the design of blended learning, especially on how the face-to-face and online components can be combined.

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Introduction

Blended learning (BL), which involves both online and face-to-face (FTF) contact time between teaching staff and students, and/or among students in a course, is increasingly implemented in higher education around the world (Graham, Woodfield, and Harrison 2013). Empirical studies have shown that BL can enhance student engagement and learning outcomes (Dziuban et al. 2011; Means et al. 2010), students' satisfactions (Martinez-Caro and Campuzano-Bolarin 2011) as well as teaching staff's (Traphagan, Kucsera, and Kyoko 2010). It also facilitates interactions among students and between students and teacher staff (Aspden and Helm 2004; So and Brush 2008), and the development of learner autonomy (De George-Walker and Keeffe 2010; Snodin 2013). At the level of the institution, the adoption of BL increases enrolments (Dziuban et al. 2011). Despite all these benefits that have been documented, the implementation of BL is not without challenges (Owston 2013). The term 'blended learning' has been criticised as conceptually unclear as it could have different meanings to different people (Oliver and Trigwell 2005). Front-line teaching staff may not share the vision of the institution on BL but have to engage in the implementation (Bohle Carbonell, Dailey-Hebert, and Gijselaers 2013).

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There may also be a gap between the existing competence of staff and that required by BL (Ocak 2011). The core challenge teaching staff may find is how to combine the more traditional FTF instruction with the computer-mediated online learning (Bliuc, Goodyear, and Ellis 2007; Graham 2006). While the differences between these two types of learning are well documented (e.g. Graham 2006), how they can be blended together effectively is the chief concern of BL. Based on a collective case study of courses at a higher education institution, this paper aims to formulate a set of design principles for BL by studying how teaching staff design the 'blend' in their BL courses and how the 'blend' supports student learning.

Defining BL

Broadly speaking, blending learning involves elements of both FTF and online learning. The exact definition of BL differs for different researchers and educators. Some definitions focus on the reduction in classroom seat-time with the replacement of online activities (e.g. Graham, Woodfield, and Harrison 2013; Picciano 2009). Other definitions focus on the proportion of FTF and online components (e.g. Watson et al. 2010). For example, BL can be defined as having 30–79% of content delivered online (Allen and Seaman 2010). Although these definitions could provide a clear boundary of what is BL and what is not, they do not highlight the learning aspect of BL. Our definition of BL is one proposed by Garrison and Kanuka (2004), emphasising BL as the 'thoughtful integration of classroom FTF learning experiences with online learning experiences' (96). We choose this definition because it highlights the design efforts needed for the implementation of BL. The meaning of 'thoughtful integration' is, however, something needs to be unpacked. In this paper, we aim to explore different ways that the two main types of learning, online and FTF, can be thoughtfully combined for the sake of enhancing student learning.

Designing a BL course

There are basically three different design approaches to BL: (1) adding extra online components to a traditional course taught FTF; (2) replacing some FTF activities by online ones; and (3) building from scratch (Alammary, Sheard, and Carbone 2014). Although the differentiation provides some guidelines to design a BL course, there is still a research gap of how the online and FTF components can be thoughtfully combined. Although there are articles exploring the strengths and weaknesses of learning FTF and online (Graham 2006), less is known about how the two components can be connected in the design of a BL course. Oliver and Trigwell (2005) argued, based on the variation theory that learning occurs when the learner discerns the critical aspects of variation (Marton and Tsui 2004), the combination of different FTF and online components in BL should enable a learner to experience variations. It suggests that in a BL study, learners' experience has to be taken into consideration, as opposed to some previous studies that only the instructors' perspective was explored. Our aim is to identify the possible relationships between the FTF and online components in the design of a blended course, so as to have a better understanding of how to blend in BL. Moreover, in our investigation, both the instructors' and students' perspectives will be explored.

Use of online discussion in BL

A whole range of teaching and learning activities, including lecturing, student discussion, computer simulation, the use of clickers and other mobile technology, etc., can be employed in BL. One popular online component that can be found in the BL literature is the use of a computer-mediated platform for students to conduct asynchronous discussion (e.g. Chen and Looi 2007; Cheung and Hew 2011; Graham 2006). From a social constructivist approach (Vygotsky 1978), online discussion allows students to negotiate ideas and construct knowledge together, which are facilitative to their learning (Gunawardena, Lowe, and Anderson 1997). Moreover, as students can initiate the discussion and build on the ideas of others, their epistemic agency (Scardamalia 2002) is important, which is consistent with the finding that a beneficial effect of BL is the development of students as independent learners (Snodin 2013). Compared to synchronous discussion that requires the co-presence of students at the same time, asynchronous discussion allows more flexibility for students to regulate their own pace of learning and have time for reflection, and is hence preferred by more instructors (Cheung and Hew 2011).

Research questions

The research questions addressed in this study are as follows:

(1) What are the different types of blend in BL courses and how do they support student learning?
(2) What are the challenges and issues of BL experienced by instructors and students?

Method

Research context

The institution studied is a higher education institution in Hong Kong, with a specialisation in teacher education. It has a strong commitment to quality enhancement of student learning and professional development of teaching staff. This study is part of the initiative at the institution to identify how BL courses are being implemented. It is anticipated that existing and new teaching staff will have a clear picture about how BL is implemented in the selected courses on the one hand and apply the strategies in their courses to enrich the quality of teaching and learning on the other.

Participants

We used purposeful sampling, with the criterion that the chosen participants should be information rich (Patton 1990), to select instructors for interviews. We invited the Director of the educational development unit of the institution to nominate teaching staff who have implemented BL in their teaching. Three instructors were nominated; all of them had rich experience in using technology for teaching in the institution, such as Wiki, discussion forum, and other tools in the Learning Management System (LMS). They were invited to join the study and suggest a course they taught, which employed a blended

approach, for our analysis. A total of three courses were hence studied and they were taken as the unit of analysis. The three courses were related to Confucian morality, assessment for learning, and the teaching of Chinese language, taught by Instructors A, B, and C respectively.

We interviewed the instructors individually whereas the students in group settings (except for the course related to assessment for learning). The selected students were referred by the staff for focus-group interviews which were based on the principle of snowball sampling (Creswell 2015). A total of 11 participants joined the interviews which consisted of 3 instructors and 8 students. Three students were from the course related to Confucian morality; one from the one related to assessment for learning; and four from the one related to Chinese language teaching. All participants were free to take part in the study and not given any inducement. Each interview lasted for about half an hour to one hour, depending on the length and breadth of the dialogue.

Moodle as the LMS

All three courses under studied employed the open-source platform, Moodle, as the LMS, as this is the official LMS employed in the institution. Some useful features of the platform include uploading and sharing materials, holding online discussion, giving quizzes and surveys, gathering and reviewing assignments. As revealed in the paragraphs below, the major online learning activity employed by the instructors under studied was online discussion using the Moodle forum.

Research design and data analysis

This is a collective case study (Yin 2009) of three blending learning courses taught by three different teaching staff in a higher education institution. Case study is chosen as it is the appropriate research method for addressing the 'how' and 'why' questions, with a focus on a contemporary issue within a real-life context (Yin 2009). A collective case study design allows cases to be compared and contrasted, so that their similarities and differences can be identified (Yin 2009). In this study, each BL course represents a case. An important feature of case study is the use of multiple sources of data for the purpose of triangulation (Yin 2009). A total of three sources of data: (1) interviews with instructors; (2) interviews with students; and (3) document analysis of course outlines, are employed in this study.

The first source of data comes from in-depth semi-structured individual interviews (Galletta 2013) with all three instructors, aiming to explore how they design and implement the course. The interview questions include the instructors' key goals of the course, the BL strategies used, types of learning activities designed, how information and communication technology has been used, the benefits of taking the course, and the challenges encountered. The second source of data comes from focus-group interviews (Vaughn, Schumm, and Sinagub 1996) with students who have taken the courses. The interview questions for students include how information and communication technology has affected learning in the course, how the course is different from other traditional courses, the most as well as the least effective aspects of activities in the course, the benefits

of taking the course, and the challenges encountered. The third source of data comes from document analysis of course outlines of the three courses.

Using the method of thematic analysis (Braun and Clarke 2006), the first author read and re-read the interview transcripts so as to familiarise with the data. Initial codes were then generated, and similar codes were aggregated into themes, which were further modified by comparing the themes with the codes and the entire data set. The themes identified in teachers' interviews were then triangulated with those in students' interviews. For example, one instructor mentioned the use of online forum for students to discuss the concepts he introduced in class, so as to deepen their learning, which was in line with what was mentioned by the student. Besides, the design of the course as mentioned by the instructors was triangulated with the analysis of course outlines. For example, one instructor mentioned the importance of allowing students to think twice, which was in line with the design of the course as indicated in the course outline.

Results

As case study emphasises a holistic approach of analysis (Yin 2009), we will present the analysis of each case, followed by a cross-case analysis for examining similarities and differences across cases.

Case 1: a course related to Confucian morality (Instructor A)

Case 1 analysed is the course related to Confucian morality, offered for undergraduate students majoring in a whole range of disciplines, including Liberal Studies, Mathematics, Environmental Studies, Early Childhood Education, etc. The main teaching and learning activities in this 12-week course were lecturing, student presentation followed by FTF and online discussion. One special design pattern of the course, as noticed from the course outline, was that except the first three weeks and the last week, the remaining eight weeks were organised in four pairs of consecutive weeks, with each pair covering one topic related to Confucian morality. In the first week of each pair, students conducted presentations in groups; Instructor A then lectured in the following week. During the presentations, students could receive comments from classmates and Instructor A. Based on these comments, students could modify their PowerPoints and upload to Moodle for further comments and discussions online. As explained by Instructor A in the interview, the goals of this blended course were to let students learn the theories of Confucius and apply them in the real world. An important rationale of the design of the course was that he wanted the students to 'think again',

> The use of blended learning allows students to think again if they are not sure about the related issues … I let them revise their PowerPoint after presentations and discuss further on the forum as I want them to think carefully what they have mentioned in class. (Instructor A)

Such a design was echoed by what the students said in the interview,

> We upload the PowerPoint to Moodle when the presentation is over. Other groups can then take a look at it and comment on the arguments, which facilitate more discussions. After the presentations, we can review the arguments and revise the words. (Student A1)

Instructor A believed that thinking once, or going through the materials once, was not enough for learning. Hence he required students to think again through participating in different types of activities, including presentations, discussions, and listening to lectures. One interesting thing to note is that one of the Confucian educational principles is that by reviewing old materials, we can know new things, which is well in line with the underlying rationale of the course design. As mentioned by one of the students, learning in this way can help them to consolidate their knowledge,

> Discussion after class can consolidate our knowledge. We need to search for more information to enhance our knowledge. We need to process our thoughts and what we have written, which can contribute to our learning. (Student A2)

Instructor A emphasised the development of student thinking through discussions, in which reflection could occur,

> I welcome them to bring questions for discussion. This is a process of reflection. We value the importance of reflection, which requires students to think about what we say as correct or not, and to pursue the truth. (Instructor A)

The students highlighted the importance of online interactions with the instructor and other students,

> The instructor can reply to students' enquiries instantly through the Internet, which allows continuous learning inside and beyond classrooms as well as interaction with students. (Student A1)

Instructor A noticed that interaction was particular valuable in this course, as the students were from different disciplines, the comments they made could help to open the scope of one another,

> Students with different majors use their own perspectives to raise questions for the discussions. Students may then know that their arguments are not well supported in the eyes of other students. (Instructor A)

Besides the use of Moodle for uploading materials and discussion, another technological element involved was the use of videos by students in their presentation. According to Instructor A, students liked to use video, which was attractive, but he also noticed the limitation,

> They love using videos for the presentations … This is attractive … However, some students are weak at logical thinking. This is particularly the case for the use of videos, which requires less rigorous logical thinking … Unlike reading books, users seldom step back and think twice before they continue to view the videos. (Instructor A)

The importance of 'thinking twice' is well aligned with his notion of 'think again' and the design pattern of the course as analysed earlier. The major challenge encountered by Instructor A was the difficulty in managing the learning abilities of students. The language ability of some of the students might not be capable enough to understand the classical Chinese poems used in the course. Moreover, he found that some students might not have sufficient time to finish the assignments. The issue of time was also mentioned by one of the students as they 'need to spend some time to gather ideas first before posting ideas' (Student A2).

Case 2: a course related to assessment for learning (Instructor B)

Case 2 is the course related to assessment for learning, offered mainly for in-service teachers, who were elder than the undergraduate students in Case 1. As noticed from the course outline, the course lasted for a total of 13 weeks, with 8 weeks conducted FTF, and 5 weeks purely online (weeks #3, #5, #7, #10, and #11), during which students were required to plan and write journal entries, read articles and discuss online, and they would receive feedback from the instructor online. It could hence be said that the course design involved a reduction in classroom seat-time with the replacement of online activities. According to the interview, the objective of Instructor B in choosing a blended approach was to 'ensure teaching and learning happen outside the classroom, not bounded by the four walls'. He wanted to 'extend students' learning outside classrooms', and this extension is what defines BL,

> One extends the other, and one does not happen without the other. That is what blended learning is. (Instructor B)

It suggests that the online and FTF components of a blended approach should be closely connected. Instructor B had a clear concept of the strengths and weaknesses of FTF and online learning,

> Some concepts need a lot of explanation. I would use face-to-face lessons to explain and give examples, and the virtual one for discussion … Then you can extend the conversation. (Instructor B)

The learning experience shared by the student was in line with what Instructor B said above,

> When I hear about formative assessment or summative assessment initially, I cannot fully understand these concepts. When an online platform is available for discussion among students, you know more about them. (Student B1)

The use of the online discussion platform allowed students to interact with students even from other countries,

> We have the opportunity to interact with students from other countries, such as India, and understand how they conduct assessment in their countries. (Student B1)

By extending the classroom space to the online space for interactions, Instructor B noticed the importance of prompt feedback,

> The key benefit is the extension of conversation and the ability for you to be able to give feedback not just the next lesson that you meet. Prompt feedback is the key to learning. (Instructor B)

Another reason for Instructor B to adopt a blended approach was to cater for diverse needs of students,

> Some of them have a lot to say online, sometimes they do not talk much in classrooms. You want to encourage participation for different types of students. Some students talk a lot in classrooms but they do not talk much in the virtual discussion, which varies from students to students. (Instructor B)

The third reason was more pragmatic. As the students were in-service teachers and many of them did not live near the campus, Instructor B decided to replace some FTF sessions by online ones so that they did not need to come back to campus every week to save their travelling time.

The major challenge Instructor B encountered was how to engage students,

> There are just some students not comfortable putting their comments in black-and-white. They would just observe but they may be learning as well. The challenge is how to engage all students. (Instructor B)

To facilitate student engagement, he employed a number of strategies,

> Sometimes I would send them a private e-mail just to have a chat about it. Try to encourage them, or give them a role to present something or to share their assignment. For some of the weeks, I would do a summary of what have been discussed. At times in between, I would send out a mass e-mail to tell them the key issues in their discussions. You have to let students know you are reading their posting. (Instructor B)

The student also noticed the instructor had played an important role in organising the information on the discussion forum,

> Whereas technology plays the role of transmitting information, the instructor performs the role of organizing information. I receive so much information but I do not know how to organise it. The one who organises the information is the instructor. (Student B1)

The demand of time was another challenge Instructor B encountered. Technology might be a challenge for some students, but it could also be a learning opportunity for students,

> Technology is a problem but you don't need to attempt to solve unless they can't solve among themselves. I have two to three cases that students help one another … You need to give them the responsibility in the classroom and in virtual to make sure they are more accountable to each other. (Instructor B)

Case 3: Chinese language teaching for young children (Instructor C)

Case 3 is the course related to Chinese language teaching for young children, offered for in-service kindergarten teachers, who were observed to be elder than the undergraduate students in Case 1 and in-service teachers in Case 2. As noticed from the course outline, the course lasted for a total of 16 weeks, covering the aspects of reading, writing, listening, and speaking of Chinese language learning for young children. The major online element in the course was online discussion using the Moodle forum. Instructor C asked students to post their difficulties encountered in the course. Students could comment on one another's posts. During the class time, Instructor C opened the Moodle forum and responded to the points articulated by students. He also asked them to submit assignments through Moodle, and he would provide them with feedback. The major reasons for Instructor C to adopt a blended approach were to extend learning and cater for needs of different students,

> Moodle caters the needs of various students, in which some of them prefer asynchronous learning to synchronous learning. Moodle helps to extend learning to take place inside and outside classrooms. (Instructor C)

Instructor C also emphasised the importance of FTF instruction, and hence BL was the most suitable approach,

> Face-to-face teaching and learning is important in this course: some exercises and question can assess students' performance immediately … Blended learning strategies allow students to do in-depth discussion. I allow students to read several materials before they come to my class. In the classroom, they discuss what they have read. They undergo the process of in-depth discussion and self-learning. They have to write down the points on the discussion forum. We can trace their points and give feedback. (Instructor C)

The point he made was echoed by what the students said in the interview,

> In a blended learning approach, the face-to-face settings and information and communication technology are complementary to each other, as they suit different learning approaches by different learners. (Student C1)

One of the students mentioned how the instructor implemented the blended approach,

> The instructor shows how to access Moodle in the middle of the course for submitting assignments and reports to Moodle and how to conduct group discussion. Students give feedback to others for the discussion on the listening session. Then we submit outlines of reports to the instructor and receive the feedback from him for writing the reports through Moodle. (Student C2)

By viewing the other's works, they could learn from one another,

> We can learn from other student's work as students can refer to other groups' work and answers, and grapple the key points of others' work. (Student C2)

Instructor C pointed out the advantage of flexibility associated with the use of a blended approach,

> If the students have a better level of acceptance (of technology), then I spend more time in information and communication technology. If they prefer traditional teaching, I will focus more on face-to-face teaching and learning. (Instructor C)

A student appreciated the convenience and quickness in receiving feedback through Moodle,

> It is convenient as the time for receiving feedback, such as the outline of reports, from teachers to students is shorter. We do not have to wait until the next lesson. (Student C3)

Instructor C also embedded the links of useful websites using Moodle for students to learn about the correct pronunciation of Chinese and how to deliver speech at their convenience. The students found this kind of learning useful,

> By learning through the Internet, we can learn the skills of delivering speech. It's a kind of flexible learning that we can learn at any time. (Student C4)

The major challenge Instructor C encountered was that some of the students might not be that good at technology, but it could be solved by telling them which buttons to press. The challenges mentioned by the students were related to the language interface and the use of the platform,

> I do not know how to access Moodle the first time I use it as I do not know English well. I seek help from my classmates, who told me that traditional and simplified Chinese are available,

> too. A classmate does not know how to operate Moodle at earlier times, she seeks help from other students and learns how to operate. (Student C2)

Similar to what has been reported in Case 2, with the help of the fellow classmates, the challenge of technology to the students could be solved.

Cross-case analysis

There are similarities across cases studied. First of all, they all employed online discussion as the major computer-mediated component. Feedback from instructors and other students were considered as important in all cases. Regarding to the goals of employing a blended approach, all instructors emphasised the enhancement of student learning, though saving the travelling time of students was also mentioned in Case 2. All three instructors were well aware of the diversity of students. Catering for diverse needs of students was highlighted in Cases 2 and 3, while the benefit of having students from different disciplines to widen the scope of one another was mentioned in Case 1.

There are, on the other hand, differences across cases. First of all, the course design in Case 2 involved replacing FTF sessions by online activities, while Cases 1 and 3 involved the adding of online discussion as an extra activity. Technology as a challenge for students was mentioned in Cases 2 and 3 but not Case 1, suggesting that the younger generations (undergraduates in Case 1) might be more used to technology than the older generations (in-service teachers in Cases 2 and 3). The most important difference identified is perhaps the rationale behind the blended design in the three cases. Different types of learning activities were used in Case 1 to actualise the notion of 'thinking again', leading to the consolidation of knowledge as articulated by the students. While in Cases 2 and 3, different types of activities, FTF and online, were used to extend the space of learning of students. Based on these differences, two major principles underlying the design of a BL course, consolidation (Case 1) and extension (Cases 2 and 3), can hence be identified.

Discussion

Design principles of a blended approach

Building on the definition of BL proposed by Garrison and Kanuka (2004), we aim to explore how FTF and online learning can be 'thoughtfully integrated'. The analysis of the three cases suggest that two major design principles for BL, or two major ways of integration, namely, consolidation and extension, can be differentiated. The consolidation principle emphasises the combination of different components so that students can consolidate their knowledge by engaging in different types of activities, such as listening to lectures, presentations, and online discussions. The extension principle emphasises the extension of learning from one space to another, and that the FTF and online components are complementary and have their own strengths and weaknesses. The two principles should not be considered as mutually exclusive, especially on the potential learning outcomes of students, as the extension of learning from, say, the classroom space to the virtual one, can also help students to consolidate their knowledge. Similarly, by thinking again and revising the same materials through different types of activities, students can also extend their learning. The two principles are, however, more differentiable in the

design of the course. By organising the course into pairs of weeks with different types of activities for students to engage in, Instructor A aimed to allow students to think again, to revise their PowerPoints, and to reflect, leading to the consolidation of knowledge. In contrast, by replacing some FTF sessions by online activities, and by adding the component of online discussion to existing activities, Instructors B and C respectively aimed to allow students to extend the space of learning and provide the flexibility to cater for diverse needs of students. The two design principles are also differentiable based on how they support student learning. In Case 1, where a consolidation approach was identified, Instructor A emphasised student reflection and the development of student thinking (see also Dyment and O'Connell 2010). In Cases 2 and 3, where an extension approach was identified, Instructors B and C emphasised students' self-exploration, and catering for various needs of students so that they can choose a better way to learn and decide on their own pace of learning.

In addition to these two principles that differentiated the design of the three courses, there are common design principles that can be identified in all three cases. First of all, all cases highlighted the active role of learners, which is in line with the existing literature that BL facilitates the development of students as autonomous learners (Snodin 2013). All three cases emphasised the importance of interaction and feedback, which is in line with the educational literature that feedback has a powerful influence on learning (Hattie and Timperley 2007). Thirdly, the diverse backgrounds and needs of students were taken into consideration in the design of the three courses. These common design principles can be summarised as students being active learners, the chance of providing and receiving feedback, and the awareness of student diversity respectively.

Relating the findings with ideas of Oliver and Trigwell (2005)

Following the advice of Oliver and Trigwell (2005), an important contribution of this paper is the consideration of both instructors' and learners' perspectives. The identification of consolidation and extension principles has integrated both instructors' intentions and learners' experience. On the other hand, Oliver and Trigwell (2005) argued that different components in BL should allow a learner to experience variations. It seems that Case 1, with consolidation identified as the major underlying design principle, is more compatible with the idea of experiencing variations, as there are different activities for students to go through the course content more than once, and hence it's more likely for them to discern critical aspects of the content by experiencing variations. On the other hand, Cases 2 and 3, with extension as the major design principle, seems less related to the idea of learning through experiencing variations, as the focus is on the extension of learning space from FTF to online, and catering for various needs of students. However, students in all cases alike mentioned the benefit of using the online discussion platform for interacting with one another, suggesting that they could also experience variations by encountering different perspectives of other learners.

Support for BL

A number of challenges were mentioned by the instructors and students. Technology was a challenge to some of the students in Cases 2 and 3. However, as articulated by Instructor

B, students' problems with technology can be turned into learning opportunities, as students can help one another to address the problems. A similar example was mentioned by students in Case 3. As put forward by Instructor B, the key is to give students the responsibility to take care of their own learning, which is in line with the emphasis on learner autonomy in BL. Moreover, as the three instructors are all familiar with the use of technology, they did not encounter technological challenge. It might be expected that technology is a challenge to some instructors, suggesting that support should be provided by the institution for the implementation of BL (Garrison and Vaughan 2013). The demand of time was mentioned by some of the students as another challenge, suggesting that the instructors should be aware of the workload of students, as they 'need to spend some time to gather ideas first before posting ideas' (Student A2). The instructors may also adopt the strategy suggested by Instructor B of summarising what have been discussed on the forum. Another challenge an instructor may encounter is how to engage students. The strategies employed by Instructor B, such as encouraging students and letting them know the instructor is reading their posts, may provide valuable insights on how to address this challenge.

As identified in the BL literature, professional development opportunities for teaching staff are important for the successful implementation of BL (Garrison and Vaughan 2013), because they may not know how to integrate the FTF and online components (Bliuc, Goodyear, and Ellis 2007; Graham 2006). The findings in this study, especially on the identification of different design principles, can be embedded in professional development activities for staff who are interested in BL.

Limitations and further studies

One limitation of this study is that the chief online component in all three cases was online discussion. Although the use of online discussion is popularly found in BL (e.g. Chen and Looi 2007; Cheung and Hew 2011; Graham 2006), there are other online and computer-mediated learning activities that can be employed, such as computer simulation and mobile technology. Future studies can explore more cases with the use of other online learning elements. Moreover, the student sample, with a total of eight students, might not be large enough for the examination of different experiences of students. In future studies, more students can be interviewed for exploring more experiences of students in BL. In addition to the use of interviews, an experimental approach may be adopted in the future to examine, say, whether student reflection is really enhanced by taking a blended course designed with the consolidation principle. Similarly, we may examine whether students' flexibility to learn is really enhanced in a blended course designed with the extension principle.

Conclusion

BL involves the thoughtful integration of FTF and online learning experiences (Garrison and Kanuka 2004). By taking into consideration both the perspectives of instructors and students, this paper contributes to the understanding of BL by identifying different types of blend in a blended course and how the blend supports student learning. Two major principles that differentiated the design of blended courses, namely, consolidation and

extension, are identified. The principle of consolidation emphasises the use of different types of activities, including lecturing, student presentation, and online discussion, for students to think again and reflect, so that their knowledge can be consolidated. The principle of extension emphasises the use of FTF and online activities to extend the space of learning and cater the diverse needs of students. There are also common design principles that can be identified in all three cases, namely, students being active learners, the chance of providing and receiving feedback, and the awareness of student diversity. These principles can be used as guidelines for the design of BL and embedded in the professional development of staff interested in BL.

Disclosure statement

No potential conflict of interest was reported by the authors.

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