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EXPLORING TEACHING APPROACHES IN BLENDED LEARNING

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Blended learning is becoming increasingly popular in higher education. The purpose of this study is to explore the pedagogical use of ICT in a blended learning context. Focusing on teachers' and students' experience, we examined the following questions: What are the students' and teachers' experience in engaging with different blended learning modes? What are the teaching approaches involved in blended learning across disciplines? Four teaching approaches, namely, providing online resources, supporting specific pedagogy, focusing on online discussion, and enhancing course management and delivery, emerged from the results of ten case studies. These approaches are pedagogical practices in transition and provide empirical evidence to shed light on issues in the research and practice of blended learning in higher education.

Keywords: Blended learning; teaching approaches; pedagogy; higher education.

1. Introduction

Twenty-first century universities are continuing to go through rapid socio-economic and technological changes. These changes have brought about a call for universities to examine carefully their educational practices from a new perspective and to face the challenges that lie ahead in knowledge-based societies (Pittinsky, 2003). These challenges include: a large population of learners from varied backgrounds, needs, motivations, abilities, learning preferences, time availability and course content requirements; a greater number and variety of higher education places without corresponding increases in funding (Phillips, 2005); a demand for more "client" responsive and flexible courses; and the drive to use information and communication technology (ICT) in teaching and administration (Challis, Holt & Rice, 2005). In facing such challenges, academic leaders in higher education need to rethink organizational structures, operational strategies, and policies appropriate for the ongoing digital age (Duderstadt, Atkins & Houweling, 2002).

Despite the evident growth and potential of ICT in higher education (Green, 2004; Gibbons, 2005), some studies (e.g. Fox & Herrmann, 2004) have highlighted the limitations of teacher and student uptake of ICT for educational purposes. Academic e-learning has usually been focused on quantity rather than quality, and on superficial technological adoption rather than conceptual pedagogical change process (Davidovitch, 2007). As a result, many university students and teachers make only limited formal

academic use of ICT in teaching and learning (Selwyn, 2007). The apparent self-evidence of educational innovation using ICT has hardly prompted people in higher education to reflect on the very idea of innovation and consequence (Westera, 2004), and a "business as usual" approach has been taken without anticipating any real dramatic changes (Collis & Wende, 2002). The diffusion of technological innovation for teaching and learning has not been widespread, nor has ICT become deeply integrated into the curriculum (Mehra & Mital, 2007). Thus, ICT-supported innovation in pedagogy, curriculum, and assessment is rare in higher education (Bullen & Janes, 2007; Cross & Adam, 2007).

ICT implementation in higher education is not a simple technological adoption, but involves the consideration of a number of issues, such as infrastructure, pedagogical practices, obstacles, student learning, organizational culture, organizational structures, operational strategies, and appropriate policies (Duderstadt, Atkins & Houweling, 2002; Guri-Rosenblit, 2005). There is a need to relate the normative interpretations of the potential effects of ICT on teaching and learning in higher education to the empirical realities that higher education institutions are facing (Stensaker, et al., 2007) because "successful technology integration is a sociological issue" and "appropriate use of technology in teaching requires the thoughtful integration of content, pedagogy, and technology" (Mishra, Koehler & Zhao, 2007, pp. 1-2).

To address the complexity of ICT integration in higher education, this paper attempts to explore the pedagogical use of ICT in a blended learning context. The exploration is focused on the experiences of teachers and students, and guided by two research questions: What are the students' and teachers' experiences in engaging with different blended learning modes? What are the teaching approaches involved in blended learning across disciplines?

2. Blended Learning

The online learning platform or learning management system (LMS) provides an interactive environment for communication among students and teachers and equips teachers to provide scaffolding for students to engage in collaborative and cooperative activities even beyond classrooms. It is believed that collaborative learning leads to better student involvement, better performance, and higher productivity (Nunamaker, Briggs, Mittleman, Vogel & Balthazard, 1996), which is the case of e-learning systems, where students perceive greater opportunities for communication than those in a traditional classroom (McCloskey, Antonucci & Schug, 1998). There is an emerging trend in higher education to combine online and face-to-face modes of learning, often referred to as blended learning (Garrison & Kanuka, 2004). Though the definitions of blended learning are many and various (Deng & Yuen, 2009), Garrison and Vaughan (2008) define blended learning simply as the thoughtful fusion of face-to-face and online learning experiences. "The basic principle is that face-to-face oral communication and online written communication are optimally integrated such that the strengths of each are blended into a unique learning experience congruent with the context and intended educational purpose" (Garrison & Vaughan, 2008, p. 5).

Recent studies of blended learning in higher education have been focused on student experience and practices (Jefferies & Hyde, 2010; Holley & Oliver, 2010). Edginton and Holbrook (2010) designed a study to assess pharmacy students' attitudes towards a blended learning course. Results indicated that students' concerns about the blended method of learning had decreased after the course, while their enthusiasm for the benefits of blended learning had increased. Initially, students were anxious about their ability to communicate with the teacher in the online components, but by the end of the course, this concern had shifted to a concern over their time management skills. Face-to-face interactions with each other and with the teacher were more highly rated than online interactions in the course. Based on social cognitive theory, Wu, Tennyson and Hsia (2010) proposed a research model that examined the determinants of student learning satisfaction in a blended e-learning system environment. The findings indicated that computer self-efficacy, performance expectations, system functionality, content features, interaction, and learning climate were the primary determinants of student learning satisfaction with the blended e-learning system environment. The results also showed that learning climate and performance expectations significantly affected learning satisfaction, while computer self-efficacy, system functionality, content feature and interaction significantly affected performance expectations. In addition, interaction had a significant effect on learning climate.

Apart from student practices, studies have also focused on teaching practices. Mortera-Gutierrez (2006) presented a case study of a higher education institution in Mexico. The study described faculty best and worst practices using a blended learning approach of e-learning and face-to-face instruction. The best blended learning teaching practices and strategies found, related to the instructional results, were: (a) the organization of every learning outcome on time throughout the complete semester helped greatly in achieving learning objectives; (b) those teachers who were flexible with the administration of students' assignments had a better educational response from the students; and (c) teachers always gave feedback to their students. This study recommended that further studies be conducted to provide a fuller understanding of blended learning environments, in particular those related to teaching practices and strategies. Vaughan (2007) explored the benefits and challenges of blended learning in higher education from the perspectives of students, faculty, and administration that had direct experience with blended learning course delivery. Faculty indicated that the challenges faced in developing a blended course included a lack of time, support and resources for course redesign; acquiring new teaching and technology skills; and risks associated with delivering a course in a blended format. Ocak (2010) presented the findings of an exploratory, qualitative case study and examined problems and impediments that faculty members encountered in blended learning environments in the Turkish higher education system. The findings showed that faculty members' problems with blended teaching resulted in the identification of three inductive categories: instructional processes, community concerns and technical issues. Eight themes further emerged from these three categories: complexity of the instruction, lack of planning and

organization, lack of effective communication, need for more time, lack of institutional support, changing roles, difficulties in adopting new technologies, and lack of electronic means. This study indicated that teaching blended courses can be highly complex and can involve different teaching patterns, which, in turn, affects the successful implementation of blended learning courses. However, the study of teaching approaches in blended learning has received little attention. This paper thus aims to explore the teaching approaches involved in blended learning, focusing on the experience of both students and teachers. In this paper, teaching approaches are characterized as having motive and strategy components and defined in terms of teaching strategies with associated intentions (Kember, 1997).

What makes blended learning particularly effective, as suggested by Garrison and his colleagues (Garrison & Kanuka, 2004; Garrison & Vaughan, 2008), is its ability to facilitate a community of inquiry (CoI). The heart of a CoI consists of three key elements: social presence, cognitive presence, and teaching presence. Students in a CoI must feel free to express themselves and be able to develop the personal relationships necessary to gain a sense of belonging to the community. The formal categories of social presence are open communication, cohesive responses, and affective connections. Cognitive presence is basic to the inquiry process, in which inquiry includes the integration of reflective and interactive processes. Teaching presence is essential to provide structure, facilitation, and direction for cohesion, balance, and progression of the inquiry process. A CoI provides a framework to understand the blended learning processes. Moore's (1989) theory of three types of interaction provides another meaningful lens to examine students' interaction and engagement in blended learning. The three types are: learner-content interaction, learner-instructor interaction and learner-learner interaction. Learner-content interaction is the process of intellectually interacting with content and defines a major part of learning. When learning involves solely learner-content interaction, it becomes primarily self-directed. Learner-instructor interaction can have a great influence on learning by maintaining learners' motivation and providing support and evaluation. Learner-learner interaction can also be a valuable resource for learning. These three types of interaction as well as the three elements of CoI were used to guide the exploration of teaching approaches in this study.

3. Methods

Case study is formally defined as an exploration of a bounded system over time through in-depth data collection from multiple sources of information rich in context (Miles & Huberman, 1994). Different researchers have different purposes for studying cases, and there are three types of case study: intrinsic case study, instrumental case study, and collective case study (Stake, 1994). This study takes an intrinsic approach. Its major objective is to learn from the experience of the teachers and students in the pedagogical use of ICT in a blended learning context, and description and interpretation are the main concerns.

The case study was conducted in a university which is the oldest tertiary education institution in Hong Kong. The university has been identified as a high-ranking international university with over 20,000 students in the 10 faculties (see Table 1). In 2008-2009, the university had 21,652 students (11,962 undergraduates, 9,690 postgraduates), of whom around 5,300 were mainland Chinese and international students. In order to arrive at a pool of potential cases representing various disciplines for the study, a project advisory group was formed, which included the research team, academic staff and education development staff of the university. In consultation with the advisory group, the research team managed to identify one case of pedagogical use of ICT from each faculty, which provided a score of experiences reflecting a range of pedagogical practices using ICT in blended learning. The background of the 10 selected cases is summarized in Table 1. Obviously, these experiences are bottom-up and never theoretically-driven in nature. The criteria for case selection included: (1) courses or pedagogical practices in which ICT played a substantial role; (2) evidence of high level of student participation in blended learning modes; and (3) different learning outcomes exhibited.

Table 1. Background of selected cases

Case	Faculty	Course/Program taught in the case
Case 1	Architecture	Construction course for undergraduate students
Case 2	Arts	Course in logic and critical thinking for undergraduate and postgraduate students
Case 3	Business and Economics	Undergraduate course in business
Case 4	Dentistry	Undergraduate course for dentistry students
Case 5	Education	Undergraduate course for teacher education
Case 6	Engineering	Undergraduate course in industrial engineering
Case 7	Law	Undergraduate course in law
Case 8	Medicine	Undergraduate course for medical students
Case 9	Science	Biodiversity course for undergraduate students
Case 10	Social Science	Geography course for undergraduate students

In order to collect data rich in context and capture their complex interactions, for each case, the following data were collected: documents about ICT use in the case and the curriculum materials; in situ lesson observations; and semi-structured interviews with students and teachers.

As for lesson observations, the following data were obtained: (1) field notes – one or two researchers attended each lesson and took notes to describe the setting, the transactions that took place as well as comments on the observations made; and (2) the researchers also collected curriculum materials related to the lessons observed, including course outlines, handouts and other printed or online materials. Semi-structured interviews were conducted with teachers before the lessons took place to find out about the lesson objectives. After the lessons, the teachers were interviewed and asked to

comment on how far the targeted learning objectives were achieved. Major questions for teacher interviews included: What is your view of how students learn and your role in the pedagogical practice? What changes have the use of ICT brought about? What experiences do your students have in using ICT?

In addition, the research team sought permission and help from the teachers to invite a group of 4 to 6 students for a focus-group interview after the lessons. Major questions for student interviews included: Can you describe the typical uses of ICT and how important they are in your study? In those experiences of ICT uses you have described, are there ways to improve your learning experience? What is your role? The research team also collected complementary documents from the teacher, such as the faculty or department development plan in relation to ICT in teaching and learning, and the staff development plan in support of ICT implementation in the faculty or department.

A thematic coding and grounded approach (Miles & Huberman, 1994) were adopted in the data analysis to construct categories guided by the research questions. NVivo (http://www.qsrinternational.com/) was employed to analyze the collected data, which provided a computer-based workspace that enabled researchers to work through the qualitative data efficiently. The data were analyzed to identify various key properties that could be integrated into some coherent categories. Attempts were made to understand the teaching approaches in the process of blended learning.

4. Results

Four categories of teaching approaches involved in blended learning emerged from the analysis of the 10 selected cases, namely, providing online resources, supporting specific pedagogy, focusing on online discussion, and enhancing course management and delivery. The following sections portray the cases under these four categories.

4.1. *Providing online resources*

The course in Case 2 was a credit-bearing course offered to both undergraduate and postgraduate students. The aim of the course website was to provide free online learning resources on critical thinking to assist teachers and students alike, both in Hong Kong and other countries. A range of learning resources, including lectures, powerpoint presentation, critical thinking web, wiki, and blog, was provided to support online tutorials, online quizzes, and class exercises. The teacher gave six two-hour lectures including discussion time. As the objective of this course was to learn, evaluate and apply the critical thinking skills in daily life, the teacher provided rich learning materials and vivid examples in his critical thinking web and wiki for students to refer to. Self-directed learning was also significant in this course as students had to construct their own body of knowledge by choosing and studying the modules freely in the critical thinking web. They were free to take the quizzes and answer the more challenging questions.

The teaching approach of “providing online resources” seemed to be associated with traditional instructional methods such as exercises and examinations, as described by a student during the interview: “[The teaching mostly consists of] traditional methods. We

study and have an exam after the teacher teaches us. [We use] the notes from the website; for the exercise you can click for the answer. It tells you whether the answer you have chosen is correct or not. The teacher has a homepage; you login and there are 20 multiple choice questions. When you have finished you press submit. This is the way. We are not using paper sheets for exams" (Students' interviews, Case 2). However, this approach was helpful and well-received by students: "I think the [course] website is helpful. Those theories have been mentioned in the class, but there is more detailed information about their underlying origin on the internet. Also, there are some lovely animations and exercises" (Students' interviews, Case 2).

One student took it further and connected the resources with learning, commenting: "Wiki is used to make announcements and keep notes. It allows all students to access notes. The critical thinking web is for students to do exercises and allows them to understand the concept further. It is also a place for discussing and exploring questions, whereas in the classroom, it provides a space for student discussion, and it is the first step towards learning" (Students' interviews, Case 2).

The course in Case 10 was a geography undergraduate course in the Faculty of Social Sciences. The objective of this course was to provide students with a factual basis for making intelligent decisions concerning the use and interpretation of maps. The teacher had used the Geographic Information System (GIS) to demonstrate map usage. Her department kept a GIS laboratory to provide hands on training for students in this course. During the semester, students were required to complete 3 tasks which were highly dependent on the use of the GIS. The lab was maintained by a teaching assistant, who was only available for assistance several hours per week.

The arrangement of using GIS in the lab seemed to be not very well-received by students. As there was only one teaching assistant, the whole class was divided into two groups, and two scheduled time slots were allocated for each group. However, students did not follow this arrangement. The teacher said: "They didn't come to the time slot we scheduled. They just want to come anytime they wish. A technician is there to assist, but he might not stay there for the whole day. The students feel upset if they can't find someone for help. We have already allocated two sessions and each session can hold 25 people, but not many of them come in this two sessions" (Teacher's interview, Case 10).

In response to this observation, the teacher changed the GIS component to the free public accessible map online. The free public accessible online map not only to provided 24-hour access for students; the teacher envisaged that it would also allow the students to have more room for their own exploration, which would encourage them to explore freely; find new interests and new orientations; find what subject was suitable for their career; and help them to make a difference in the process of understanding the different areas of research. It would also encourage students to diversify their interests and to discover their strengths, and facilitate active learning through inquiry of the map data. The role of the teacher was to provide online resources, and students made use of the online resources for their assignments and projects.

In general, it was also found that students preferred to learn step-by-step, as reflected by the teacher: "Yes, step-by-step, they like it. We have to push them. We gave them fewer instructions for the second and third assignments. However, the fewer the instructions given, the more difficulty they had in handling the assignments. Nowadays, students always say they want to learn more; indeed, they want us to offer them things step-by-step. We have to provide a lot of guidance. After the first two exercises, I wanted them to have more initiative in the next project, but they didn't and complained to me instead. I explained to them that they could apply the skills that they had learned in the first two exercises in this project, but it seems they preferred a more spoon-feed mode" (Teacher's interview, Case 10).

In sum, the two cases (Case 2 and 10) were categorized under the approach of "providing online resources". In this teaching approach, online resources were provided for students for self-learning and to learn in a flexible way. It was generally well-received by students when the online resources could be accessed anytime. For the course in Social Science (Case 10), which was lab-based and then online, students were not very happy with the arrangement that they could only use the lab during a fixed time slot. Students were also found to prefer step-by-step guidance rather than exploring on their own when using GIS in the lab. In these cases, the teachers' role was mainly to deliver information online and guide students to think, while students made use of the online resources and applied them to assessment tasks and daily life. One concern was teachers' proficiency in using ICT in teaching. In general, the teachers were not ICT experts, and it was thus time-consuming for them to prepare materials by using ICT. Technical problems also posed a challenge to teachers. Another issue is that, given the fast-changing nature of ICT, should teachers keep up to date with ICT development?

4.2. *Supporting specific pedagogy*

Case 4 was about integrating ICT with problem-based learning (PBL) in the Faculty of Dentistry, which is student-centred and clinically focused. One teacher stated: "In the program, it's a whole, because we have previously used WebCT in a particular simulation laboratory course. We decided to use the functions of WebCT to support learning in the PBL program. For a number of reasons we want students to have better communication with teachers and one another, and also to have access to certain learning resources online. Therefore, we set it up. We are trying to develop more learning resources, such as video, demonstrations of clinical procedures, and a library of resources for the students" (Teachers' interviews, Case 4). Another teacher echoed this: "One of the key things is that WebCT is intended to support student self-learning time because they do not have much time for face-to-face discussion with teaching staff. They are working collaboratively or individually, so they are doing a lot of their own research, and that's where the WebCT is a support, as a platform to bridge them" (Teachers' interviews, Case 4).

Students regarded the major role of WebCT as a means of providing information; as one student said: "It provides information, and a channel to access notes and data. For me,

it assists me in learning" (Students' interviews, Case 4). In addition, students could connect to the WebCT with PBL: "When we first entered university, the university introduced us to the function and the use of WebCT. We have continued to use it throughout our dental course. In our PBL system, a new problem is posted every week. Apart from the hardcopy provided by the teacher, we can read the notes on WebCT, so you don't have to worry if you lose the notes, because they are accessible online" (Students' interviews, Case 4).

Nonetheless, it is important not to overlook the issues involved in the selection of information for PBL in terms of types, quality and usefulness, as reflected in a student's interview: "I think the ICT that the entire university is using is quite ordinary; the information and feedback you obtain do not really help in teaching. For example, if you upload notes, it is the same as looking for a book. Powerpoint, etc. is the main and only ICT being used. If you want to make it better, I suggest that some tutorial videos be included as they are more practical. We can find the information online by ourselves; if the information provided by teachers is unorganized, we would probably use our own methods to search for it rather than relying on the system. I think information from videos and Powerpoint are more useful. As we are using PBL, you don't need to give us too much information. For me, PBL is a system that we ourselves decide how much we want to study. After we choose how much we want to study, the teachers can then upload the materials that we need" (Students' interviews, Case 4).

There was a small management problem in such a fully integrated PBL curriculum, as pointed out by a teacher: "When the students post questions, we have a type of filtering system, so the students post questions related to the problem. Then, there has to be an interpretive level, where that question is then classified to the relevant area. The staff members then give their responses, which are posted and made available for the whole year. In terms of interactivity, I first find that it is a little bit quirky. In a fully integrated curriculum, you really cannot do it in any other way" (Teachers' interviews, Case 4).

Case 8 described an integration of ICT and evidence-based practice (EBP) in the Faculty of Medicine. The goal of applying this EBP was to enable students to learn how to ask clinical questions and step into patients' shoes with respect to what their concerns and considerations were during the decision making process. The tutorials were supported by online teaching and learning resource materials. In the tutorial, clinical case videos on WebCT were shown to students for discussion. The teacher acted as a facilitator in the discussion process to help and encourage the students to link up their knowledge and observation with practice. During the discussion, students were advised to perform a real-time online literature search to answer the problems from the video clips or to support their discussion. They could re-visit the clips after class or whenever they wanted to. The students' made use of the video and online resources to support their learning. The EBP strategy enhanced self-directed learning through the use of web resources and other references.

ICT seemed to be an essential part of the EBP course. According to a survey conducted by the research team, all the students thought that learning would not be the same without ICT. Several students said that without ICT in their EBP it would be very troublesome and less interesting. However, students demanded more than merely watching videos in the lesson. Many of them felt that there had not been sufficient use of ICT in the course. While it was useful for their learning, it had only been used for watching videos. Nevertheless, the role of ICT in providing online resources was very much welcomed by the students in the EBP course. All students indicated that the features they used most in the EBP course were downloading notes, and retrieving reference research papers. They generally felt that the notes were useful to them and needed for the lectures. The clinical video clips, however, seemed to have been not so useful in the eyes of the students. All students commented that they would not watch the clips again at home even they were uploaded on WebCT because they did not find viewing them again would help their study. con

From class observations conducted by the research team, the ICT facilities in the classroom were found to be not very advanced. The video clips were played on a desk-top computer with a 15-inch CRT monitor, and it was difficult for 10 students to look at a such a small screen all together for 10 minutes. Students sitting away from the computer could not view the videos clearly. There were no projection facilities in the room either. It was also found that the teacher was not familiar with the technology and took 5 to 10 minutes to work out how to use the computer. She then sought students' help to play the video.

In sum, two cases (Case 4 and 8) from a clinical discipline were categorized under the approach of "supporting specific pedagogy". For this teaching approach, ICT was integrated with PBL and EBP in the Faculty of Dentistry and Medicine respectively. Students' learning online was mainly based on WebCT. Students thought that the major role of WebCT was in providing information. In the case of Dentistry, there was an information selection issue in terms of types, quality and usefulness. Information needs to be carefully chosen based on students needs. In the case of Medicine, it was found that ICT was not used comprehensively in the course as only videos were shown, and students said that it was not really useful to watch the videos again at home. Since ICT was an essential part of the EPB course, students might have have gained more benefits if a wider range of ICT resources had been provided. There was also an issue of ICT facilities, such as the lack of projector facilities, which may have hindered teaching effectiveness of the program.

4.3. *Focusing on online discussion*

Online discussion is a common teaching approach in using ICT in a blended learning context. Case 5 concerned a core course in an undergraduate teacher education program. This course lasted for 21 weeks with a three-week teaching practicum included. The teacher of this course encouraged students to have online asynchronous discussion outside regular classroom meetings. As an experienced and dedicated online facilitator

herself, the teacher found that this group of students were not engaged with online discussion in spite of her constant encouragement both online and offline. This set off the investigation into the factors behind students' disengagement. Motivating and inhibiting factors that affected students' participation in voluntary online discussion in a blended learning context are reflected in the following excerpts from students' interviews.

Interestingly, some students perceived the online discussion as a "resource"; as one student commented: "I think mainly because there is a kind of resource within the online forum other than the face-to-face meetings in the lectures" (Students' interviews, Case 5). In particular, such online discussion provided opportunities for students to ask questions and form a community; in the words of another student: "I use the online discussion forum because I want to ask some questions. I have some questions in my mind after the lecture, and I can't see the lecturer every day, but if there is an online discussion, there is a community, and the lecturer encouraged us to use it, so I'll just post it" (Students' interviews, Case 5). In such online communication, students' as well as the teacher's participation is extremely important. When a student was asked why she only read the messages without responding, she answered: "Because I don't think other people are reading. Frankly, most of the professors do not respond to us very often, apart from some of them" (Students' interviews, Case 5).

Students were not very sure about their performance in online discussion being assessed. In the words of one student: "We are obliged to do that. I really don't like that because at the very beginning, the lecturer told us that this was part of the assessment, so you need to post your findings or insights on the discussion forum" (Students' interviews, Case 5). In addition to assessment, the interplay between online and face-to-face discussion in blended learning needs thoughtful scaffolding; as a student remarked: "Another problem about the course is that when we meet on Wednesday during the lecture, we are required to show our discussion that we have already posted on the discussion forum, and in the lecture, we are actually talking about the same thing as we talked about on the discussion forum. That`s why I really don't like them. But in [another course] I think it's a bit different because the discussion on the online community is different from what we have addressed in the [face-to-face] sessions" (Students' interviews, Case 5).

Case 9 was an undergraduate second year module in the Division of Biodiversity, Faculty of Science. The Learning Support Centre (LSC), which was basically a department website serving like a LMS, was used for teaching. It contained career advice and other learning resources links. All modules were transparent to all students. Students could comment on other modules or download notes from other modules. The main teaching goal was to use the discussion forum as a place for students to collaborate and communicate among themselves on the practical case study assignment. The teacher selected some cases to post up on the LSC discussion forum (module chat), and students were divided into several groups accordingly to work on a case study. A group report was generated by the group, and the assignment comprised 20% of their final marks. The

whole class could comment on and discuss the cases shown. The teacher believed that using the forum could help them to discuss one another`s projects easily.

Students' views of the usefulness of the discussion forum seemed to deviate from the teacher's assumption. The students felt that they were forced to do discussion online as the teacher would not give them marks if they did not do so. They only participated because it was part of the assessment. One student said, "No one will discuss online if it is not being assessed. After the teacher told me that the more I participated, the more marks I would get, I immediately logged in to the forum. Some people had already posted messages there, so I also posted something else. Later on, more and more people joined the discussion" (Students' interviews, Case 9).

The discussion forum could be made more comprehensive and instructional in order to appeal students. One student reflected that he did not really know what to do on the forum and he did not participate until just before the deadline. Another student suggested, "It could be more interesting, for example, to create a website with some pictures, introductions and some other information. Then, we would be more willing to take a look at it. The task only has word description; it would be more understandable if there were some pictures and flashes [web multimedia]" (Students' interviews, Case 9).

Although the discussion forum was being promoted in the module, students still found the feature "providing resources" most useful. According to the student survey, The "Programme" section, where the teacher posted up the lecture notes for each lecture, was voted the most useful. Students could download notes before the lecture started. The second most useful feature was the "Module Resources", which contained a list of recommended texts and also web links to other relevant online resources.

Case 3 described an undergraduate level course in the Faculty of Business and Economics. Two web-based technologies were employed to support the traditional lecture-based course. A course blog was set up on Xanga, a popular commercial blogging service in Hong Kong, which served as a bulletin board posting course-related materials such as handouts, or announcements about assignments or tutorials. It was also a friendly and interactive platform for students to post comments, ask questions or seek help. The course blog was set to public so that everyone could view the content without logging in. Another communication channel (i.e. MSN) was used as a supplementary tool to provide just-in-time assistance to students. As a near-synchronous tool, it allowed students to post questions and seek just-in-time help at flexible times and place.

Blogs and MSN not only provided a faster and convenient channel for communication and giving feedback, they also contributed to a better relationship between the teacher and students. Students were more willing to use and felt more comfortable using these tools to communicate with the teacher; as the teacher pointed out: "I've found that instant messaging or emails and blogs, are something that students are more familiar with. They will show more initiative in looking for you. In the past, if you asked them to call you, they would hesitate, but if you say hi to them in MSN, they will find it easily. Also, I find that in using these technologies, especially using instant

messaging, teachers can build a better relationship with students" (Teacher's interview, Case 3).

It was not compulsory for students to post comments or questions on the blog, but they were encouraged to do so by the teacher. The teacher explained: "I think one reason [for not making it compulsory] is that I did not require them to do something on it because you know that when you require them to do something they will think it's annoying, so I did not require them to do so. I think some of them would comment on it, use it to ask questions, subscribe to it, but some of them would just use it as a regular website and just download materials from there, but I didn't put more effort into pushing it to be better, so I just keep using it" (Teacher's interview, Case 3).

A security problem was found in using the blog; as a student mentioned: "Xanga is open to the public, but there are some contents or internal information that we don't want to show to the public" (Students' interviews, Case 3). One student suggested that it would be more user-friendly if they were using their own course website. He explained, "It is not necessary to create by ourselves; we can get some templates on the internet, which include discussion forum and material upload. This makes online management easier and more orderly. There are only links in Xanga; this is too simple and limited in use" (Students' interviews, Case 3).

In sum, three cases (Case 3, 5 and 9) were categorized under the approach "focusing on online discussion". Generally, students did not like being assessed by online discussion, and felt that they were "forced" to post something online as it counted towards their assignment marks. Students' participation rate was always an issue. They only participated because their participation was part of the assessment. In the case of Business and Economics (Case 3), the teacher used blog and MSN in his teaching and found that students were more willing to communicate with him. These two are considered informal online communication tools, and participation was neither compulsory nor assessed. This raises the question of whether making participation compulsory in online discussion helps students' learning. Interestingly, in the case of Science (Case 9), students saw online discussion as a tool for providing resources. In this teaching approach, it seemed that students still favored the convenience of getting resources online the most.

4.4. *Enhancing course management and delivery*

Case 1 described a core course for undergraduate students in the Faculty of Architecture. The teacher had just started to use WebCT for the sake of the streamlined administrative work and the technical support offered by the centralized unit at the university. The teaching was conducted on WebCT. The course was quite organized. One folder was created for each week. Teaching materials such as notes, links, handouts and assignment were posted in the corresponding folders. Students had to complete the individual assignment for each week, and there was an online test at the end of the semester. Students submitted assignments through WebCT, and the individual assignment with teachers' grading and feedback was also posted. The main learning objective of the

course was for students to grasp the main concepts and principles in the subject area. Students were expected to participate in the weekly learning activities and demonstrate their understanding of various concepts.

Students felt there were major differences between face-to-face and online classes. As a platform focusing on course management and delivery, WebCT was regarded by students as mainly a place for downloading materials and submitting assignments, but not a place for teaching and learning. One student remarked: "I prefer face-to-face lectures which will help me to concentrate on learning. Online learning is often distracted by other things like watching TV" (Students' interviews, Case 1). Some students felt uncomfortable with online learning: "Some notes are difficult to understand without the lecturer's explanation. Maybe I'm not used to learning through WebCT and asking questions through the Internet" (Students' interviews, Case 1). It seems clear that students were in favor of a good blended mode of learning; as another student commented: "A face-to-face lecture is necessary since concepts can be explained more clearly. Using both face-to-face and online [teaching] is a good combination" (Students' interviews, Case 1).

Case 7 documented a core course in the Faculty of Law. A course homepage was created and kept as an interface for students to obtain everything they needed. The teacher explained: "What I do is maintain a course homepage. I teach 2 courses, and I use the homepage to deliver all the basic materials, assignments, tutorial work, lecture outlines and all the notices that students need to know about. I reach them through the homepage. There is a discussion blog, so they can raise questions. My course runs on the homepage with the textbook I wrote on the subject. They really only use my textbook and homepage, and they have everything they need" (Teacher's interview, Case 7). However, the discussion blog was not functioning, and students were complaining, so the teacher had decided to go for WebCT.

In this case, technology was more like an administrative tool for course management than a means of promoting students' deeper learning. The teacher noted: "In my case, it is useful as an organizing tool, but as for achieving deeper learning, I don't think so. I have to achieve it by good tutorial problems, good materials and questions I post in my book and lecture. In the end, it comes down to delivering a strong lecture and organizing good tutorial problems on a weekly basis that will challenge students and cause them to engage. Nothing to do with technology helps" (Teacher's interview, Case 7). Similarly, students felt the use of WebCT had made course management better, and WebCT was seen as a course administrator. A student said, "You can download lecture notes and evaluations, and discuss questions through WebCT. It supplies what we need. It is more like a course administrator. It tells you when the test starts and finishes and gives you feedback; how to get lecture notes, etc.. Basically, it is like a teaching assistant" (Students' interviews, Case 7). Besides administration work, WebCT was considered a bridge for communication. Some students were too shy to ask questions face-to-face, but if there was a discussion blog, they were willing to post questions there.

Some students were confused about the use of different systems or tools, such as LMS and the student information system. The guidelines did not seem to be clear enough; as a student reflected: "At the beginning I was confused. I didn't know how to get to [the university] website. I didn't know what the difference was between Student Connect [note: Student Connect is the university student information system] and WebCT. I was not sure about what WebCT was used for. It took some time for me to get to know the broadening stuff. Some exchange students said that they didn't know there were different things such as WebCT, portal and Student Connect. After we had entered the website, there were a list of links, and we did not really know which one to choose. It took some time to check it out" (Students' interviews, Case 7). Another student concluded that the system was not integrated enough, and it would be better if the whole system could be connected: "If Student Connect can connect everything at one time, that is truly student connect" (Students' interviews, Case 7).

Case 6 described an undergraduate course experimenting with ICT innovation in the Department of Industrial and Manufacturing Systems Engineering, Faculty of Engineering. The course aimed to provide the students with more flexible, especially collaborative, learning experiences, as well as better means for the students to support one another's practice by forming a community of practitioners among themselves. An interactive multimedia e-learning system provided a teaching platform specifically for industrial engineering. The teacher pointed out: "I think mainly at this point it is for dissemination of information, you know course teaching materials. It might be a platform for students to hand in their assignments, to give some feedback, and also do some peer evaluations…and a platform for student-to-student, student-to-tutor evaluation. I think that's more or less what we use it for at this stage" (Teacher's interview, Case 6). In addition to LMS, a cave automatic virtual environment (CAVE) system was used to facilitate teaching by creating an interactive virtual reality, whereby images from the system were projected onto the four walls of an enclosed room.

The teacher found that the e-learning platform was effective in delivering course information, and that learning through cyberspace allowed more freedom and space. Especially for the part-time master-level students, LMS created a learning platform for students who might not be able to come to the campus more regularly. Some traditional classroom type-learning was conducted, such as student presentations, interactive materials and tele-conferencing.

Concerning the drawbacks of using LMS, adequate ICT support was essential in order to make LMS worked effectively. The teacher said: "For example, if I want to put some virtual material, you know, virtual reality, really to motivate or to make the material more attractive, then I probably need support from them. Without knowing the technology, without, for example, the computing support…both the hardware and software, and also human resources, it is really difficult to make it work" (Teacher's interview, Case 6). However, having enough support did not necessarily encourage teachers to use ICT in their teaching. It was more about the culture, or teachers' own attitudes toward ICT. The teacher further explained, "I think the culture probably is the

most important rather than the technology. Even if you give them support, you give them technologies, a lot of teachers will feel reluctant to implement them. Most of the teachers would just say, well, it's nice but what I am doing is very good or sufficient, why bother? I provided students with good hand-out, good notes; they can have face-to-face contact; and my office is open most of the day. Teachers' attitude is the main obstacle in pushing the pedagogical use of ICT too far." (Teacher's interview, Case 6)

In sum, three cases (Case 1, 6 and 7) were categorized under the approach "enhancing course management and delivery". In this approach, ICT was used to enhance course management and delivery. In the above three cases, different course management systems (e.g. WebCT) and an interactive multimedia e-learning system were used to achieve the teaching and learning goals. Two main roles of ICT were observed, i.e. a tool for self-learning through accessing online resources and an administrative tool for course management. To enhance course management and delivery, different types of online tools were usually used through LMS in order to increase teaching efficiency, such as disseminating online resources, accessing and evaluating students, using discussion forum for teacher-student and student-student interactions. Despite the multi-purposes of LMS in this teaching approach, the use of online resources for self-learning was being used dominantly in Case 1 and Case 6. Both teachers and students regarded LMS as a platform which allowed more freedom and space for students' self-learning. However, this freedom did not necessarily increase students' motivation in learning. Students' initiatives for self-learning is a concern in that they might not adapt to the change from a face-to-face to an online learning mode. For the Architecture case (Case 1), it was discerned that students felt that a blended mode of learning and face-to-face lecture was necessary for them to get a clearer explanation. For the case of Law (Case 7), the use of LMS was more like an administrative tool than a means of helping students to achieve deeper learning. As a general observation, it seems that the LMS serves as an organizing tool in which teachers can make teaching and learning more effective. They only need to go to the webpage, and most of the teaching and learning can be done there, for example, uploading learning materials, arranging online assessments and evaluation, and interacting with students.

5. Discussion

Garrison and Kanuka (2004) conclude that blended learning is consistent with the values of traditional higher education institutions and has the proven potential to enhance both the effectiveness and efficiency of meaningful learning experiences. This study provided an empirical exploration of the pedagogical use of ICT in a blended learning context. Focusing on the teachers' and students' experience, four teaching approaches emerged from the findings of 10 case studies (Table 2). The identified teaching approaches are not meant to represent a comprehensive or mutually exclusive list of categories. Rather, they are formed as a working theory of blended learning in practice to conceptualize teaching approaches in the development of blended learning modes. These approaches demonstrate a range of strategies and associated intentions in using ICT in different

blended modes. Students' experiences were positive in general. The approaches were well-received by students and stimulated meaningful learning in some sense. Nonethless, we also identified obstacles and challenges for each case, including issues concerning teacher practice, student practice, culture, facilities, assessment, and technology.

Table 2. A summary of teaching approaches emerged from the data analysis

Teaching Approaches	Case	Faculty
Providing online resources	Case 2	Arts
	Case 10	Social Science
Supporting specific pedagogy	Case 4	Dentistry
	Case 8	Medicine
Focusing on online discussion	Case 5	Education
	Case 9	Science
	Case 3	Business and Economics
Enhancing course management and delivery	Case 1	Architecture
	Case 7	Law
	Case 6	Engineering

Students' overall attitude towards learning online without face-to-face lectures was rather negative. Learning online was similar to learning by themselves, which put considerable strain on their self-discipline and time management skills. The traditional lecture was considered more effective by many students in grasping concepts and principles. This result appears to confirm the conclusion of an aforementioned study (see section 2) about a blended learning approach to teaching basic pharmacokinetics, in which students "became more concerned about and aware of the importance of managing their own time […] students placed a high value on face-to-face interactions with the instructors and their peers for asking questions about the problem-solving aspects of this course" (Edginton & Holbrook, 2010, p. 9). Meanwhile, the web-based platform was acknowledged as a flexible and convenient resource when downloading course notes and submitting assignments. It was concluded that ICT might be better as a supplement to face-to-face class rather than a replacement (Yuen, Deng & Fox, 2009), as Larkin (2010) argues similarly that "students in general, do not aspire to replace lectures with downloadable, online versions. Many of the students […] valued the opportunity for interactive learning provided by face-to-face teaching" (p. 238).

In the cases described above, students still had face-to-face interaction among themselves on a daily basis in the campus. The social presence within the community was abundant. Although the online community was acknowledged, the questions remain as to whether an online asynchronous discussion among students would be necessary and what roles should be played by such online discussion. This is the reason why the teachers mostly considered the learner-content interaction in designing the online component as focusing on the process of interacting intellectually with content (Moore, 1989). To ensure the cognitive presence in the online activities, teachers designed sets of structured

and assessment-centered tasks. Students needed to read the material and finish assignments or exercises. Assessment was employed as a crucial measure to motivate and engage students. The teacher-student interaction mainly depended on asynchronous tools like email and online feedback on students' work. Such a self-directed mode of learning left students working independently. All in all, evidence of a "community of inquiry" (Garrison & Vaughan, 2008) seems clear in the blended learning process described in the aforementioned cases. However, the social aspect of the online community is not noticeable and needs to be strengthened, as the key challenge in online learning is to encourage knowledge sharing through social interaction, participation, and engagement in various forms (Ma & Yuen, 2011).

The results indicated that students' disengagement in online discussions was due to a number of factors. It is possible to speculate that course design, students' characteristics as well as community dynamics would be essential aspects that need to be considered. It has been suggested that the design of online activities plays a critical role in arousing students' interests, engagement and motivation, especially at the launching stage of blended learning (Yuen, Deng, Fox & Tavares, 2009). Thus, thoughtful design of a rewarding system, appropriate online information and tasks to be infused with face-to-face meetings is important. In addition, the teacher's facilitation and guidance are essential to ensure focused, meaningful and quality blended learning, as the integration of ICT in teaching and learning should emphasize interaction, flexibility and innovation (Bates, 2000; Selwyn, 2007), and this is to be realized by linking purpose, people and pedagogy (Stensaker, et al., 2007).

6. Conclusion

As a more pedagogically oriented innovation with many of the advantages of online learning, blended learning could well become a standard practice favoured by both teachers and students (Albrecht, 2006). However, the implementation of blended learning is a process both innovative and complex, involving multi-facet variations in curriculum content, pedagogy, ways of ICT use, teacher practices, student practices, student learning outcomes, and organizational conditions (Duderstadt, Atkins & Houweling, 2002; Guri-Rosenblit, 2005; Mishra, Koehler & Zhao 2007). The four teaching approaches presented in this paper are not meant to be proven cases of blended learning that are able to enhance both the effectiveness and efficiency of meaningful learning experiences. However, these cases have already gone beyond a simple technological adoption and have demonstrated different attempts at integrating content, pedagogy and technology in a blended learning context. In conclusion, these cases are pedagogical practices in transition and provide empirical evidence to shed light on issues in the research and practice of blended learning in higher education. They may stimulate the design and development of the next generation pedagogical innovation in blending learning and bring about the predicted "paradigm shift" (Bullen & Janes, 2007; Cross & Adam, 2007) in teaching and learning using ICT.

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