Facilitating student engagement and collaboration in a large postgraduate course using wiki-based activities

Julie Salaber

Facilitating student engagement and collaboration in a large postgraduate course using wiki-based activities

Julie Salaber

Abstract

This paper investigates the impact of wiki-based activities on student participation and collaborative learning in a large postgraduate international management course. The wiki was used in this study as a facilitator for engagement and collaboration rather than a means of online discussions. Based on both qualitative and quantitative data, we find strong evidence that the use of the wiki facilitated student engagement and collaboration, both inside and outside the classroom. Moreover, student learning had significantly improved as a result of the enhanced learning environment.

Keywords: student engagement, collaborative learning, wikis, higher education

1. Introduction

Student engagement is a key factor for learning and personal development. The idea is simple: the more students study or practice a subject, the more they tend to learn about it. Students can be engaged at different levels: with the teacher, faculty or University, with other students, and with their own learning. In this paper, we are interested in the impact of a new technology on student engagement with others (collaboration) and with their own learning (active learning). E-learning tools are now embedded in many courses and programmes, bringing new benefits and challenges to teaching. Our analysis is based on a case study as we investigate the introduction of wiki-based teaching and learning activities in a large postgraduate international management course. A wiki is a web communication and collaboration tool that can be used to engage students within a collaborative environment (Parker & Chao, 2007). Our approach differs from previous empirical studies as the wiki was used here as a facilitator for student engagement and collaboration rather than a means of online discussions. The wiki was not used for direct online discussions but was rather used for submitting and reviewing group work (Mader, 2006). Finally, the case study methodology used in this paper allowed us to triangulate our findings, ensuring the validity of our research. The data collected includes qualitative feedback from all participants (students, tutor and lecturer), wiki activity logs of individual students (number of wiki pages viewed and/or edited), as well as quantitative answers from multiple choice questions.

In the next section, we present the literature around wikis, collaborative learning and active learning. Section 3 develops the research questions, methodologies and methods used in this study. In section 4, we present our findings about the impact of wiki-based activities on student engagement and collaboration. Section 5 further discusses our results and outlines interesting unintended outcomes. Section 6 concludes.

2. Literature review

A large body of literature emphasizes the role of learning environment factors in enhancing student learning (Lizzio, Wilson, & Simons, 2002; Entwistle & Peterson, 2004; Schelfhout, Dochy, Janssens, Struyven, & Gielen, 2006). In this study we are interested in two factors corresponding to student engagement with others (peer discussion or collaboration) and with their own learning (active environment). Empirical evidence shows that peer learning allows for more interactivity, motivation and engagement from students (Goldschmid & Goldschmid, 1976; Gibbs & Jenkins, 1992; Topping, 1996; Tang, 1998). The potential of collaborative learning groups has been largely supported by the pedagogic literature (Dillenbourg, Baker, Blaye, & O'Malley, 1995; Dillenbourg, 1999), drawing on various theories of learning such as knowledge creation, knowledge building, group cognition and activity theory. Similarly, there is evidence that active learning, student-centered approaches to

teaching work, and work better than more passive approaches (Bonwell, Eison, & Education, 1991; Michael, 2006; Jie, 2009).

Social software applications, i.e., technologies that support people in communicating, interacting, and collaborating in large communities, provide new opportunities for knowledge building and collaborative learning (Dohn, 2009; Collins & Halverson, 2010; Schroeder, Minocha, & Schneider, 2010). Such pedagogical opportunities have been largely emphasized in the context of wikis (Cress & Kimmerle, 2008; Wheeler, 2009). Wikis provide new and simple ways for a web-based collaboration and authoring and have been used as e-learning environments in schools and higher education (Leuf & Cunningham, 2001; Bruns & Humphreys, 2005; Richardson, 2008). They allow the implementation of a truly blended learning process, i.e., a "feedback-driven process" (Cubric, 2007b).

Previous evidence suggests that e-learning approaches are particularly well suited for teaching and learning in the management education area (Arbaugh & Duray, 2002; Brower, 2003; Marks, Sibley, & Arbaugh, 2005; Allan, 2007; Burridge & Öztel, 2008). Indeed e-learning tools are reported to improve communication skills which are recognized to be an important employability factor in management. Students themselves perceive the benefits of e-learning in social science education (Marsh, Pountney, & Prigg, 2008). For instance, students in international management courses recognize online learning as a platform to share and exchange their academic and life experiences (Pimpa, 2011).

Cress and Kimmerle (2008) develop a theoretical framework for collaborative knowledge building with wikis: the co-evolution model. According to this model, one person's individual knowledge can serve as a resource for the learning of others. Wikis facilitate student learning by engaging them in an asynchronous way (Elgort, Toland, & Smith, 2008), allowing for future review (Brack & Van Damme, 2010), overcoming the challenges of large class sizes and limited face-to-face time (Brack & Van Damme, 2010), and providing flexibility for students with conflicting timetables and other commitments (Arbaugh & Duray, 2002; Marks et al., 2005; Carr, 2012). A recent study shows that wikis are a useful tool to facilitate collaborative blended learning among postgraduate students (Hulbert-Williams, 2010).

There are nonetheless several challenges with designing wiki-based teaching and learning activities that need to be taken into consideration. For instance, some students do not feel comfortable working in groups or feel confused about what is required of them (Wheeler, Yeomans, & Wheeler, 2008; Hulbert-Williams, 2010).

3. Research question and methodology

3.1. Research question and intended outcomes

The main research question of this study is: “How can the use of new technologies such as wikis facilitate student engagement and collaboration in a large postgraduate course?” This research question can be investigated through both direct and indirect intended outcomes. Firstly, the use of the wiki should have a direct impact on students, as it should facilitate their preparation for seminars, their participation during seminars and their collaboration out-of-class. Secondly, the use of the wiki should indirectly improve their learning environment (especially the active environment and peer discussion factors) and ultimately improve their learning of discipline-specific outcomes and transferable skills.

3.2. Case study methodology

In order to address these issues, our paper follows a case study approach (Yin, 2008). One main advantage of the case study methodology is that a complex case can be investigated in its natural context combining different research methods. This allows examining the case from various angles and ensuring the validity of the findings through triangulation.

The research participants were 76 postgraduate students from an international management module. Students came from three different Masters programmes: 18 in Economics & Finance (24%), 28 in International Management (37%), and 30 in Management (39%). More than half of the students were female and Asian. Between February and May 2012, students attended 11 weekly lectures and 10 weekly seminars (3 groups of 25-26 students). The assessment for this module was 20% in-class test and 80% final exam. The exam included an essay question and several exercises requiring calculations and/or discussion. The intended learning outcomes of this specific course were detailed in the unit template available to all students. For the purpose of this study, we also identified 5 generic graduate attributes (GGAs) relevant for the course. These skills, accredited by the Centre in Business Management Accountancy and Finance from the Higher Education Academy, are the following:

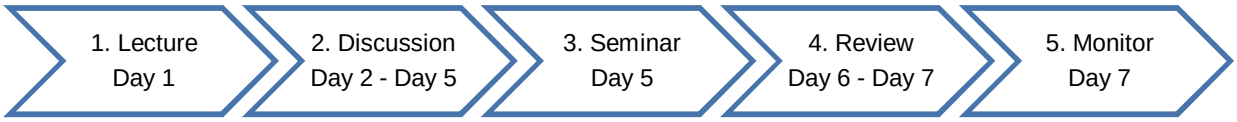
GGA1: Ability to discuss the role and operation of financial institutions
GGA2: Ability to apply major theories of finance to solving theoretical and practical problems
GGA3: Competence in using computers and information technology effectively
GGA4: Competence in critical thinking
GGA5: Ability and desire to learn for oneself and improve self-awareness and performance

These GGAs, as well as the aim of the project, were presented to students at the beginning of the semester. Finally, all teaching material (lecture notes, readings, lecture capture, etc.) was available on Moodle, the virtual learning environment at the University.

3.3. Designing wiki-based activities

The selected teaching and learning activity for this study was weekly problem-solving exercises in teams of 4 or 5 students. The innovation was that students had to enter their collaborative answer on the wiki before each seminar. Since seminar groups were quite large (25 students), and because seminars happened only once a week in a very formal context, the role of the technology was to enable students to prepare and participate during their own time. The wiki was thus used as a facilitator for student engagement and collaboration rather than as a means of online discussion. Students did not discuss directly via the wiki, although they could use various technologies (e.g. instant messaging) as online discussion tools rather than meeting physically.

Individual wiki pages were created for each team in each seminar group. There were a total of 15 teams across 3 seminar groups. We designed wiki-activities in the form of visible groups, implying that students could only edit the wiki of their own team but were able to view the wikis of all teams. Thus the wiki allowed transparency and peer learning, as activities were shared across seminar groups, and students were able to review the activity (and subsequent feedback) at any time. Following Cubric (2007a) and Laru, Näykki, and Järvelä (2012), we implemented the following process for the weekly wiki-activities:



1. After the lecture, the lecturer published weekly tasks on the wiki.
2. Students collaborated and added team contributions to the wiki.
3. The tutor could review the contributions before the seminar and orientate group discussions accordingly, giving feedback where appropriate.
4. Students could review contributions (from their own team and/or from other teams/groups) during their own time and amend the wiki if necessary.
5. The lecturer could review wiki contributions and provide general feedback; the feedback was used to re-shape the next lecture.

This lesson planning was consistent with the Castle-top model (Fink, 2003), alternating in-class and out-of-class activities and discussions. The idea of weekly tasks has been used to support structured dialogue (Gravett & Petersen, 2002) amongst students and between students and tutors. Between 2 and 3 wiki tasks were designed for each seminar (10 topics and 23 wiki tasks in total). A task could include the following activities: add a definition; add a literature review (journal articles, books, websites, etc.); solve a numerical problem; contribute to the collaborative topic analysis; complete practical exercise; etc. Two examples of wiki tasks we designed are presented in Appendix. Table 1 (page 21) shows the list of all

wiki tasks per topic. These wiki tasks had several advantages: They were participatory, favouring active learning (Bonwell et al., 1991; Michael, 2006); authentic, allowing students to develop a particular skill by solving problems as realistically as possible (Kolb, 1984; Herrington, Reeves, Oliver, & Woo, 2004); and andragogic, allowing students to be independent learners (Herod & Brandon, 2003). Thus by experiencing these activities, students were able to develop the intended GGAs.

In order to facilitate the use of the wiki, an effective induction was essential (Clark, 2001; Salmon, 2002; HEFCE, 2009; Hulbert-Williams, 2010; Pimpa, 2011). Once students were introduced to the e-learning project during the first lecture, the Moodle wiki was explained to them during the first seminar by a member of the e-learning team at the University, who was acting as e-moderator, i.e., her role was to ensure user access and encouragement. During this 30-minute induction, students had to work on a simple task in order to familiarize themselves with the wiki and become confident using it. Indeed the activity at this stage needs to "provide a gentle but interesting introduction to using the technological platform" (Salmon, 2002). Students had to work in teams and edit the wiki as a team; thus encouraging collaboration at an early stage. A manual on how to use the wiki was also made available on Moodle, in case students had any problem with accessing, editing or reviewing wiki pages. The lecturer also uploaded clear instructions about the weekly wiki-based tasks directly onto the Moodle course front page so that students were able to refer to them at any time. During the second lecture, students were given feedback on the wiki induction task as a way to encourage them (step 1 of Salmon's model) and to provide bridges between sociocultural and learning environments (step 2). The goal was to demonstrate to students the wiki's ease of use to review answers and to share information.

Both the lecturer and the seminar tutor were actively involved in the study, acting as co-moderators and co-monitors. They had a key role in stimulating and facilitating the use of the technology, reviewing students' contributions in the wiki-based tasks and providing them with feedback during lectures and seminars. The role of the lecturer was also to set up the e-learning activity and design weekly online tasks. The e-learning team at the University was also involved for student induction and support.

3.4. Research methods

By combining both qualitative and quantitative data collected via multiple methods and sources, we were able to triangulate our results, ensuring the validity of our case study research. Our evaluation was based on student surveys, tutor's feedback, Moodle logs and the lecturer's personal notes. Moreover this evaluation took place at different points in time (beginning, mid and end of semester), allowing for the opportunity to provide feedback to students after the in-class test.

For the main data collection, we designed an online survey (using Google Documents) allowing collecting both quantitative and qualitative student feedback. The survey covered questions about the development of selected GGAs and the learning environment factors contributing to this development; the level of involvement (participation, preparation and collaboration) in seminars; the level of engagement and collaboration during lectures; and specific questions about peer interaction. As our intention was to encourage all students to participate in the activity, the use of an online survey (with a direct link on Moodle) seemed the most suitable data collection method for this project and targeted all 76 students. One limitation of this method was its lack of flexibility and adaptability compared to face-to-face meetings.

The survey was distributed to students once at the beginning of the semester (during the first seminar) and once at the end of the semester (during the last lecture). The second survey differed slightly from the first one, including extra questions about the specific impact of the wiki-activities. Both surveys are available from the authors upon request. To ensure a high response rate, students were asked to fill in the surveys in-class. They were asked in advance to bring their personal laptops or other devices to connect onto Moodle via the University's Wi-Fi network. The hard-copy equivalent of the surveys was also available for students who could not fill in the survey online. Overall, 57 students completed the first survey (75% response rate), out of which 21% Economics & Finance, 40% International Management and 39% Management; and 40 students filled in the second survey (53% response rate), out of which 35% Economics & Finance, 20% International Management and 45% Management. The smaller number of respondents for the second survey was mainly due to the fact that many students did not attend the last lecture. This may have various causes, e.g. they were busy with coursework deadlines in other modules or because the content of the lecture was not part of the exam. In addition, many Economics students registered late to the course and did not attend the first seminar; thus they did not have the chance to fill the first survey. This explains the higher proportion of Economics students for the second survey compared to the first one.

For the first survey, all 57 students answered online, whereas only half of the respondents answered the second survey online. In the latter case, all hard-copy questionnaires were transcribed into Google Docs in order to produce a comprehensive summary of responses. From these 2 surveys, we were able to produce statistics using the quantitative data; and we transcribed and classified all qualitative data.

The data was complemented with wiki activity logs on Moodle, including students' individual logs up to the in-class test (half-way through the semester). This data allowed us to perform a mid-term evaluation of the wiki-activities, comparing the use/editing of the wiki with individual performances during the in-class test. We

compared the test results with multiple variables using a regression analysis as follows:

$$Y = \alpha_0 + \alpha_1 ED + \alpha_2 VW + \alpha_3 TM + \alpha_4 PR + \varepsilon \quad (1)$$

Where:

Y = individual in-class test mark; α_0 = constant term capturing the impact of omitted variables; ED = number of wiki tasks edited per student; VW = number of wiki tasks viewed per student; TM = timing of first viewing, i.e., number of days between the first wiki view and the in-class test; PR = student's programme of studies (Economics, International Management or Management); ε = error term (white noise).

Finally, tutor feedback and lecturer's personal notes were collected and classified. For all participants, strict ethical procedures were adopted, including informed consent and anonymity.

4. Findings

Overall, the introduction of wiki tasks increased student learning, engagement and collaboration, not only during seminars but also during lectures and out-of-class.

4.1. Preliminary analysis regarding students' engagement in the wiki

Students were really involved at the beginning of the process, probably because of the novelty factor and the induction process. This is consistent with previous findings showing that international business students actively engaged in the online activities when they could see the link between these activities and the learning objectives (Pimpa, 2011). Students were very enthusiastic about the wiki and they all participated in the wiki induction task. For the first few weeks, all teams were answering the wiki tasks before each seminar. However engagement decreased throughout the semester (see Table 1). For the last wiki tasks (Lecture 10), none of the 15 teams edited the wikis.

[INSERT TABLE 1]

One problem was that the wiki-activities were not assessed. Another difficulty was that wiki questions were more and more challenging, as the lecturer was introducing discussion questions (essay type) where students had to demonstrate some level of critical thinking.

In order to identify any pattern in the editing of wiki pages, we collected and analysed wikis' activity history. Interestingly, each team developed a different strategy in editing the wikis. In 2 teams out of 15, there was only one student entering the answer for all tasks. In 5 teams, one student was designated to edit the 2 or 3 wiki

tasks for a particular week; thus all team members contributed to the wiki in turn. In 2 other teams, students also contributed individually in turn but more randomly. In the remaining 6 teams, students contributed individually or in pair/trio in a randomly fashion.

4.2. Mid-term evaluation

In order to give formative feedback to students on this project, a mid-term evaluation of the wiki-activities was performed, linking individual performances during the in-class test with the use/editing of the wiki as shown in equation (1).

For the in-class test, students had to revise 10 different wiki tasks, including 2 exam-related tasks. Exam-related tasks were wiki-based activities on the same topic and of the same format as questions asked in the test. In total, 10 wiki tasks with answers from 15 teams implied a number of 150 wiki pages to view for the in-class test (if students were to review answers from all teams). Two alternative proxies for ED were tested in the analysis: the number of exam-related tasks edited, and the total number of tasks edited. Both variables were highly correlated (0.75) so only the number of exam-related tasks edited per student was kept in our model.

Overall, 70% of students edited a wiki task at least once. The total number of wiki page views per student varied from 17 to 609, meaning that many students viewed the same answers several times. Regarding the timing of the viewings, students started to review wiki pages on 17th February (corresponding to the second week of teaching) and continuously reviewed pages up to few minutes before the test on 16th March.

Table 2 presents the relationship (Pearson correlation coefficients) between the dependent variable (in-class test mark) and the explanatory variables. The in-class test mark (Y) was positively correlated with all variables except for the programme of studies. VW, TM and ED were not significantly correlated with each other, which is a necessary condition for including them in a single model. For the programme of studies (PR), we tried the regression analysis including a dummy for each programme alternatively and results are identical; thus in the following analysis, PR = 1 if the student's programme was Economics, 0 otherwise.

[INSERT TABLE 2]

Results from the regression analysis are reported in Table 3 and can be summarized as follows. Firstly, the programme of studies (α_4) did not have any significant impact on the grade, as on average students from Economics, International Management and Management scored the same. Secondly, the in-class test mark was positively impacted by all 3 other variables: the number of exam-related tasks edited (α_1) had a significant impact (but not the total number of tasks edited); the total number of wiki page views (α_2) also had a significant impact; and the timing of wiki pages' viewing (α_3) had a strong significant impact (i.e., the earlier the better). It is worth noting that

the constant (α_0) was also statistically (and economically) significant, meaning that there might be other variables explaining the cross-sectional difference in marks (Green, 2011).

[INSERT TABLE 3]

The lecturer discussed these results with students few weeks after the in-class test, giving them feedback and recommendations about the use of the wiki.

4.3. Direct impact of the wiki-activities on student engagement and collaboration

All findings in this section are based on the online surveys, gathering both qualitative and quantitative data, as well as tutor's and lecturer's feedback. Multiple choice questions (MCQ) were usually answered by all respondents, which was not the case for qualitative (open) questions. In that case, percentages of responses are given relative to the number of respondents for each question (this number varies from 15 to 29). Overall, students recognized that the wiki-activities had a positive impact on their learning over and above a more traditional way of preparing for seminars.

Our first main result is the positive impact of the wiki on student engagement before/during seminars. To the question "How did the various wiki activities impact on your level of participation in seminars?" students emphasized not only the impact on participation but also the effect on preparation. Regarding their level of participation, 9 students (45%) emphasized the positive role of the wiki-activities:

> It had a tremendous impact on my participation. The wikis were very interesting.
> I would participate more as I had a greater understanding of the topic.

Regarding their level of preparation for seminars, 5 students (25%) wrote that the wiki-activities had a positive impact:

> Provide incentives to prepare questions.
> To do questions of wikis advance my study in the seminars.

In a MCQ, half of the students would have spent less time preparing seminar questions if they did not have to complete the wiki tasks. This corroborates the tutor's comment that students arrived well prepared to seminars, which is also consistent with previous findings showing that students were better prepared during face-to-face sessions (HEFCE, 2009).

Few students also recognized the positive link between preparing questions in advance and participating during seminars:

> Different kinds of activities encourage me to answer questions and participate in seminars every week.
> Wiki activities encouraged me to complete the tasks so I was able to participate actively in seminars.
> When I had done the wikis I felt better prepared in seminars and participated more.

The seminar tutor confirmed that, by preparing wiki tasks in advance, students could ask more questions related to the problems they encountered. The use of different wiki tasks for each group allowed students to cover more questions on each topic, allowing them to practice more.

> It helps me to prepare before the class, revise the topic so that I can gain more from the seminar.

Only 2 students did not acknowledge any impact of the wiki on their participation:

> I consider seminars really important and both in the case of wikis and the case of normal seminar format I would participate in the same level.

Our second important result is the positive impact of the wiki on student collaboration. In the MCQ, 65% of students would have spent less time discussing seminar questions if they did not have to complete the wiki tasks. The wiki-activities facilitated collaboration not only during seminars but also during lectures and out-of-class. Firstly, the seminar tutor recognized that the introduction of wiki tasks improved the quantity and quality of discussions during seminars, i.e., he could effectively focus on students' problems and increase collaboration. Secondly, the activity also increased collaboration during lectures, as 53% of students regularly discussed problems with other students in the lectures (versus 28% before).

To the question "How did the various wiki activities impact on your level of interaction with other students?" 10 students (2/3) acknowledged the fact that the wiki-activities increased their chance to communicate with classmates out-of-class. Even though their interaction was mainly focused on their team's members, they could extend their discussions to other topics beyond the wiki task:

> I interacted more with students because we had to communicate about the wikis.
> Increase the chance to communicate with other classmates who are not in the same programme with me.
> It gives me more chance to discuss the topic; otherwise we can only discuss during the class.
> We become closer and also tend to discuss other topics after class.
> We often change opinions and distribute tasks for the wiki.

However 5 students (1/3) felt that their level of interaction was not impacted by the wiki-activities:

> No impact.
> Almost the same.

4.4. Indirect impact of the wiki-activities on the environment and learning of students

As emphasized above, the wiki encouraged students to prepare questions in advance, to engage during seminars and to discuss with other students, thus creating a motivating environment. This is consistent with previous evidence showing that students were motivated by wiki tasks (Hulbert-Williams, 2010):

> Group aspect also acted as a motivator to work on wikis.

Most importantly, the introduction of wiki-based tasks improved the two learning environment factors targeted in this paper: active environment and peer discussion. Firstly, the advantage of “learning by doing” was recognized by students as valuable for thinking and practicing:

> It helped in learning and mostly it helped in regular practice which finance is all about.
> The more I tried, the more I learn! Through the practice, I will discover something that I thought I know, but in fact, I don't know clear enough!
> It is better because I can have critical thinking during the class instead of just receiving knowledge.

From the MCQ, 44% of students recognized that the active environment created by the use of the wiki helped them develop both discipline-related GGAs (GGA1 and GGA2), and 42% realized that the questioning environment helped them develop their critical thinking (GGA4).

Secondly, students could review answers from other teams (and acknowledge differences of opinion and thinking process) and practice with questions from other seminar groups (sometimes questions were different across seminar groups). These advantages, consistent with previous findings (Brack & Van Damme, 2010), were emphasized both by the tutor and by students:

> We can see other fellows' understanding about the seminars.
> Wiki can do more questions, because every group has different questions. And every group has a little bit different answer with same question, which can make think and discuss more.

Thirdly, teamwork and discussions were encouraged:

Group interaction was encouraged.
It is easy to find out the answer and get to know others' knowledge related to the topic.

Again this result is in line with existing studies showing that wikis facilitate collaborative learning (Cress & Kimmerle, 2008; Elgort et al., 2008; Brack & Van Damme, 2010; Carr, 2012). Overall, 42% of students in the MCQ recognized that peer learning helped them develop their competence in critical thinking.

This e-learning environment was also recognized by many students to have helped them develop not only their competence in IT, i.e., GGA3 (72%), but also their ability to discuss the role and operation of financial institutions, i.e., GGA1 (44%).

Beyond this enhanced learning environment, the use of the wiki ultimately improved student learning of discipline-specific outcomes and transferable skills. From the MCQ, 98% of students recognized that preparing seminar questions in advance helped them learn more about the topic, and 86% considered that discussing with other students had a similar impact. Moreover, 75% of students who edited the wiki believed that it also helped them learn more about the topic.

In the surveys, students had to rate their level of proficiency from low (1) to high (5) in each of the selected GGAs. As shown in Figure 1, the number of students achieving a high level of proficiency significantly increased for all GGAs during the semester, especially for the discipline-related GGAs (1 and 2).

[INSERT FIGURE 1]

Overall, these results are evidence that the wiki-activities contributed to student learning (and achievement) of specific GGAs. Thus our findings show strong support for our research question. The wiki-based activities were effective in improving student engagement and collaboration, both in class and out-of-class, and thus facilitated the achievement of the module learning outcomes.

5. Discussions

5.1. Unintended outcomes

Based on this project and previous literature, we identified several benefits of using a wiki for student learning. Firstly, the introduction of the wiki increased student participation and engagement in reflective activity through an improved learning environment. In addition to the learning environment factors discussed above, some students valued the fact that the wiki-activity was "eco-friendly", "saving paper and money". In addition, 10 students invoked the ease of access and convenience as a valuable advantage of the wiki. The wiki was recognized to be an interactive tool, allowing more flexibility and easier communication among team members:

> More interactive and very easily accessible.
> Students can communicate with each other more easily and flexibly.

Consistently, the MCQ showed that half of the students prepared wiki tasks by discussing with their team members online, whereas only 23% met physically. For those who were discussing online, instant messaging was the most popular means of communication (64% of them used MSN Messenger or Skype). This flexibility and convenience of wikis has been previously acknowledged by students with conflicting timetables and other commitments (Arbaugh & Duray, 2002; Marks et al., 2005; Carr, 2012). More particularly, postgraduate students appreciate the fact that they can access online materials from anywhere (Allan, 2007; Schedlitzki, Young, & Moule, 2011). Students in our study also emphasized the enjoyability of the wiki, consistent with previous literature (Hulbert-Williams, 2010):

> The unit is very modern and uses very nice tools such as seminars, video recording, wikis.
> Everybody in the team can do contributions and it adds more fun!

Secondly, the wiki is a suitable tool for the development of non-cognitive skills that are increasingly required by employers, such as giving and receiving feedback, working towards consensus, etc. Thirdly, the wiki-activity offers an opportunity for two categories of blended learning (Sharpe, Benfield, Roberts, & Francis, 2006): blended technology (wiki) and blended direction (student-led and autonomous learning). Finally, the wiki provides a record of discussions/answers and acts as an aid for revision, consistent with existing studies (HEFCE, 2009; Brack & Van Damme, 2010).

However the wiki-activities as we designed them come with some limitations and challenges. Firstly, students had to review too many wiki pages if they were to read answers from all 15 teams for all weekly tasks (e.g. they had to read 150 wiki pages for the mid-term exam only). Secondly, when using a new technology with students, we emphasized the importance of clear, outcome-aligned, instructions on expected output (Hulbert-Williams, 2010; Pimpa, 2011). Students need frequent and qualitative feedback from the tutor/lecturer, and a clear underlying learning/teaching process. Finally, by the end of the semester students were less active on the wikis, i.e., some groups did not upload anymore answers for the weekly tasks. Such voluntary disengagement with e-learning tools has been previously emphasized in the literature (Smart & Holyfield, 2004; Orton-Johnson, 2009; Schedlitzki et al., 2011).

Another (unintended) outcome is worth mentioning. The introduction of wiki-based activities helped reducing cultural differences among students, by taking into account the particular classroom behaviour of Asian students. Indeed, there is evidence that East Asian students have a very different culture of learning and communication compared to West European students (Wang, 2006; Hall & Sung, 2009). For

instance, Asian students are reluctant to display critical thinking in study and to participate in group work. They also appear to be less proactive than Western students in using online learning tools in business education (Nakamura, 2002; Wang, 2006). Thus, by structuring the wiki-based activities in a way that encouraged group work and equal participation, we were able to facilitate engagement and collaboration of even more Asian students. This is consistent with Pimpa (2011) who shows that foreign students found online resources extremely helpful for their learning experiences and thinking process.

5.2. Considerations for lecturers and departments

Several recommendations have been drawn from this project, as well as from previous studies (Clark, 2001; Garrison & Kanuka, 2004; Cubric, 2007b, 2007a; Barnatt, 2009; Hall & Sung, 2009; HEFCE, 2009; Hulbert-Williams, 2010; Pimpa, 2011).

One main challenge is that the wiki-activities were not formally assessed, thus impacting on students' motivation and engagement. It would be most beneficial to use this wiki-activity as embedded formative assessment, although as currently designed it does not allow monitoring the contribution of each team member and the level of collaboration within each team.

Another challenge not addressed in this study was the absence of formal training of the seminar tutor. This aspect of the project was neglected and our results would have benefited from a proper training of the tutor in using the wiki, efficiently reviewing students' contributions and giving relevant feedback during seminars, further facilitating student discussions.

Apart from the mid-term evaluation and feedback, some students commented on the lack of feedback on the wiki tasks, especially because they had to review a lot of different entries from other teams and they did not know which answers were correct, or better than others. They thus suggested that the lecturer uploaded answers after each seminar, or at least flagged the right/best answer from all teams' answers:

> If the lecturer posted all the correct answers for each wiki explaining the steps, it would make the wikis better.
> Make sure which group's answer is right, which one is not, and give feedback.

Beyond the use of wikis or other e-learning tools at the individual course level, there is a need for higher education institutions to adopt a new mentality for resource coupling and resource sharing (Barnatt, 2009). In their seminal paper, Garrison and Kanuka (2004) discuss all the challenges faced by the leaders and academic faculty of higher education institutions when adopting a blended learning approach. Among

others, they invoke the necessity of financial, human and technical resources, as well as the need for student and faculty support.

6. Conclusion

Based on both qualitative and quantitative data, our findings show evidence of a strong and positive impact of the wiki on the learning environment of students. In the context of a large postgraduate management course, the wiki effectively acted as a facilitator for student engagement and collaboration, both in-class and out-of-class. Students recognized the positive impact of the wiki on their preparation for seminars, their engagement in problem-solving activities and classroom discussions, and their collaborative learning. Overall, they recognized that the wiki-activities had a positive impact on their learning over and above a more traditional way of preparing for seminars. Feedback from the tutor and the lecturer corroborate these results. Ultimately, the learning of discipline-specific outcomes and transferable skills has been achieved and the wiki-activities contributed to this outcome.

Practically, our case study findings can easily be generalised through deduction and abduction. A deductive generalisation is drawn from a hypothesis and facts to the validation of a theory (Yin, 2008). Since our research question has been validated, we find empirical support for the co-evolution model of Cress and Kimmerle (2008), i.e., the development of collaborative knowledge building with wikis. More generally, we find support for the idea that the development of an e-learning activity can significantly enhance student engagement and learning outcomes (Hazari, North, & Moreland, 2009; Williams & Chinn, 2009). Another kind of generalisation, based on abduction, is made from known cases and applied to an actual problem situation by making appropriate comparisons (Johansson, 2003). This procedure was used in this project when comparing our particular setting (a large postgraduate management class with a clear lack of engagement and collaboration in seminars) with existing studies. Thus we are confident that our conclusions can be generalized to other postgraduate business courses where lecturers are looking for new and innovative ways to engage more students in preparing for seminars and to facilitate collaborative knowledge building.

As discussed earlier, there are both advantages and challenges in using wikis for student learning and our paper offers few recommendations in order to improve the effectiveness of wiki-based learning activities. Our study helps understand the role of new technologies in improving the learning environment of students, as well as the importance of sufficient resources and commitment at the institutional level. More generally, this paper contributes to the challenging strand of research exploring the impact of blended learning in achieving more meaningful learning experiences (Garrison & Kanuka, 2004).

References

Allan, B. (2007). Time to Learn? E-learners' experiences of time in virtual learning communities. *Management Learning, 38*(5), 557-572. doi: http://dx.doi.org/10.1177/1350507607083207

Arbaugh, J., & Duray, R. (2002). Technological and structural characteristics, student learning and satisfaction with web-based courses An exploratory study of two on-line MBA programs. *Management Learning, 33*(3), 331-347. doi: http://dx.doi.org/10.1177/1350507602333003

Barnatt, C. (2009). Higher Education 2.0. *The international journal of management education, 7*(3), 47-56. doi: http://dx.doi.org/10.3794/ijme.73.250

Bonwell, C. C., Eison, J. A., & Education, E. C. o. H. (1991). *Active learning: Creating excitement in the classroom*: School of Education and Human Development, George Washington University.

Brack, C., & Van Damme, M. P. (2010). The wiki factor: Scaffolding online learning in groups. *Curriculum, technology & transformation for an unknown future. Proceedings ascilite Sydney*, 141-146.

Brower, H. H. (2003). On emulating classroom discussion in a distance-delivered OBHR course: Creating an on-line learning community. *Academy of Management Learning & Education, 2*, 22-36. doi: http://dx.doi.org/10.5465/AMLE.2003.9324013

Bruns, A., & Humphreys, S. (2005). *Wikis in teaching and assessment: The M/Cyclopedia project*. Paper presented at the 2005 international symposium on Wikis.

Burridge, M., & Öztel, H. (2008). Investigating the relationship between student achievement and e-learning: The case of an undergraduate strategic management module. *The international journal of management education, 7*(1).

Carr, N. (2012). *Wikis, knowledge-building communities and authentic pedagogies in pre-service teacher education*.

Clark, J. (2001). Stimulating collaboration and discussion in online learning environments. [doi: 10.1016/S1096-7516(01)00054-9]. *The Internet and Higher Education, 4*(2), 119-124. doi: http://dx.doi.org/10.1016/S1096-7516(01)00054-9

Collins, A., & Halverson, R. (2010). The second educational revolution: rethinking education in the age of technology. *Journal of Computer Assisted Learning, 26*(1), 18-27. doi: http://dx.doi.org/10.1111/j.1365-2729.2009.00339.x

Cress, U., & Kimmerle, J. (2008). A systemic and cognitive view on collaborative knowledge building with wikis. *International Journal of Computer-Supported Collaborative Learning, 3*(2), 105-122. doi: http://dx.doi.org/10.1007/s11412-007-9035-z

Cubric, M. (2007a). Good Practice in using wikis to enhance learning, student support and retention for business students *HEA BMAF*: Hertfordshire University.

Cubric, M. (2007b). *Wiki-based process framework for blended learning*. Paper presented at the 2007 International Symposium on Wikis, Montreal.

Dillenbourg, P. (1999). What do you mean by collaborative learning?

Dillenbourg, P., Baker, M. J., Blaye, A., & O'Malley, C. (1995). The evolution of research on collaborative learning.

Dohn, N. B. (2009). Web 2.0: Inherent tensions and evident challenges for education. *International Journal of Computer-Supported Collaborative Learning, 4*(3), 343-363. doi: http://dx.doi.org/10.1007/s11412-009-9066-8

Elgort, I., Toland, J., & Smith, A. G. (2008). Is wiki an effective platform for group course work? *Australasian Journal of Educational Technology, 24*(2), 195-210.

Entwistle, N. J., & Peterson, E. R. (2004). Conceptions of learning and knowledge in higher education: Relationships with study behaviour and influences of learning environments. *International Journal of Educational Research, 41*(6), 407-428. doi: http://dx.doi.org/10.1016/j.ijer.2005.08.009

Fink, L. D. (2003). *Creating significant learning experiences: An integrated approach to designing college courses*: Jossey-Bass Inc Pub.

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education, 7*(2), 95-105. doi: http://dx.doi.org/10.1016/j.iheduc.2004.02.001

Gibbs, G., & Jenkins, A. (1992). *Teaching large classes in higher education: how to maintain quality with reduced resources*: Routledge.

Goldschmid, B., & Goldschmid, M. L. (1976). Peer teaching in higher education: a review. *Higher Education, 5*(1), 9-33. doi: http://dx.doi.org/10.1007/BF01677204

Gravett, S., & Petersen, N. (2002). Structuring dialogue with students via learning tasks. *Innovative Higher Education, 26*(4), 281-291. doi: http://dx.doi.org/10.1023/A:1015833114292

Green, J. P. (2011). The impact of a work placement or internship year on student final year performance: An empirical study. *The international journal of management education, 9*(2), 49-57. doi: http://dx.doi.org/10.3794/ijme.92.316

Hall, G., & Sung, T. W. C. (2009). Mind the gap? A case-study of the differing perceptions of international students and their lecturers on postgraduate business programmes. *The international journal of management education, 8*(1), 53-62. doi: http://dx.doi.org/10.3794/ijme.81.261

Hazari, S., North, A., & Moreland, D. (2009). Investigating pedagogical value of wiki technology. *Journal of Information Systems Education, 20*(2), 187.

HEFCE. (2009). Engaging learners in critical reflection. In JISC (Ed.), *Effective Practice in a Digital Age case studies*: University of Edinburgh.

Herod, L., & Brandon, M. (2003). *Adult Learning*. Paper presented at the The Family Literacy Events Committee, Brandon, Manitoba.

Herrington, J., Reeves, T. C., Oliver, R., & Woo, Y. (2004). Designing authentic activities in web-based courses. *Journal of Computing in Higher Education, 16*(1), 3-29. doi: http://dx.doi.org/10.1007/BF02960280

Hulbert-Williams, N. J. (2010). Facilitating collaborative learning using online wikis: Evaluation of their application within postgraduate psychology teaching. *Psychology Learning & Teaching, 9*(1), 45-51. doi: http://dx.doi.org/10.2304/plat.2010.9.1.45

Jie, L. (2009). From learner passive to learner active? The case of Chinese postgraduate students studying marketing in the UK. *The international journal of management education, 7*(2), 33-40. doi: http://dx.doi.org/10.3794/ijme.72.187

Johansson, R. (2003). *Case study methodology.* Paper presented at the Proceedings of the International Conference Methodologies in Housing Research.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*: Prentice-Hall Englewood Cliffs, NJ.
Laru, J., Näykki, P., & Järvelä, S. (2012). Supporting small-group learning using multiple Web 2.0 tools: A case study in the higher education context. *The Internet and Higher Education, 15*.
Leuf, B., & Cunningham, W. (2001). The Wiki way: quick collaboration on the Web. *Upper Saddle River*.
Lizzio, A., Wilson, K., & Simons, R. (2002). University students' perceptions of the learning environment and academic outcomes: implications for theory and practice. *Studies in Higher Education, 27*(1), 27-52. doi: http://dx.doi.org/10.1080/03075070120099359
Mader, S. (2006). Using wiki in education
Marks, R. B., Sibley, S. D., & Arbaugh, J. (2005). A structural equation model of predictors for effective online learning. *Journal of Management Education, 29*(4), 531-563. doi: http://dx.doi.org/10.1177/1052562904271199
Marsh, D., Pountney, R., & Prigg, R. (2008). C-SAP scoping survey on the use of e-learning in the social sciences. *Higher Education Academy Sociology, Anthropology and Politics, London*.
Michael, J. (2006). Where's the evidence that active learning works? *Advances in Physiology Education, 30*(4), 159. doi: http://dx.doi.org/10.1152/advan.00053.2006
Nakamura, L. (2002). *Cybertypes: Race, ethnicity, and identity on the Internet*: Taylor & Francis, Inc.
Orton-Johnson, K. (2009). 'I've stuck to the path I'm afraid': exploring student non-use of blended learning. *British Journal of Educational Technology, 40*(5), 837-847. doi: http://dx.doi.org/10.1111/j.1467-8535.2008.00860.x
Parker, K. R., & Chao, J. T. (2007). Wiki as a teaching tool. *Interdisciplinary Journal of Knowledge and Learning Objects, 3*(1), 57-72.
Pimpa, N. (2011). Engaging international business students in the online environment. *The international journal of management education, 9*(3), 77-89. doi: http://dx.doi.org/10.3794/ijme.93.323
Richardson, W. (2008). *Blogs, wikis, podcasts, and other powerful web tools for classrooms* (2nd ed.): Corwin Press.
Salmon, G. (2002). *E-tivities: The key to active online learning*: RoutledgeFalmer.
Schedlitzki, D., Young, P., & Moule, P. (2011). Student experiences and views of two different blended learning models within a part-time post-graduate programme. *The international journal of management education, 9*(3), 37-48. doi: http://dx.doi.org/10.3794/ijme.93.332
Schelfhout, W., Dochy, F., Janssens, S., Struyven, K., & Gielen, S. (2006). Towards an equilibrium model for creating powerful learning environments. Validation of a questionnaire on creating powerful learning environments during teacher training internships. *European journal of teacher education, 29*(4), 471-503. doi: http://dx.doi.org/10.1080/02619760600944787
Schroeder, A., Minocha, S., & Schneider, C. (2010). The strengths, weaknesses, opportunities and threats of using social software in higher and further education teaching and learning. *Journal of Computer Assisted Learning, 26*(3), 159-174. doi: http://dx.doi.org/10.1111/j.1365-2729.2010.00347.x
Sharpe, R., Benfield, G., Roberts, G., & Francis, R. (2006). *The undergraduate experience of blended e-learning: A review of UK literature and practice*. York, UK: The Higher Education Academy.

Smart, C., & Holyfield, S. (2004). An evaluation of the use of blackboard in teaching and learning in UWB. University Wales Bangor.
Tang, C. (1998). Effects of collaborative learning on the quality of assignments. In B. D. G. Boulton-Lewis (Ed.), *Teaching and learning in higher education* (pp. 102-123).
Topping, K. (1996). The effectiveness of peer tutoring in further and higher education: A typology and review of the literature. *Higher education, 32*(3), 321-345. doi: http://dx.doi.org/10.1007/BF00138870
Wang, H. (2006). *How cultural values shape Chinese students' online learning experience in American universities.* University of Georgia, GA.
Wheeler, S. (2009). Learning space mashups: combining Web 2.0 tools to create collaborative and reflective learning spaces. *Future Internet, 1*(1), 3-13. doi: http://dx.doi.org/10.3390/fi1010003
Wheeler, S., Yeomans, P., & Wheeler, D. (2008). The good, the bad and the wiki: Evaluating student-generated content for collaborative learning. *British Journal of Educational Technology, 39*(6), 987-995. doi: http://dx.doi.org/10.1111/j.1467-8535.2007.00799.x
Williams, J., & Chinn, S. J. (2009). Using Web 2.0 to support the active learning experience. *Journal of Information Systems Education, 20*(2), 165.
Yin, R. K. (2008). *Case study research: Design and methods* (Vol. 5). London, New Delhi: Sage Publications.

Table 1: List of wiki tasks per topic and number of teams editing the wiki for each task

Lecture/ Topic	Wiki task name	Number of teams editing the wiki
1	Questions – Preliminary readings	15
1	Small question	15
1	Exercise	15
2	Small questions	15
2	Exercise – Triangular arbitrage	15
2	Exercise – Speculation	15
3	Questions	15
3	Exercise – Speculating with options	15
4	Questions – Preliminary readings	15
4	Exercise – Covered interest arbitrage	14
5	Small question	14
5	Discussion questions	13
7	Discussion question	12
7	Selective hedging	13
7	Hedging a payable	10
8	Questions	6
8	Exercise – Interest rate swap	8
8	Exercise – FRA and option hedging	7
9	Questions	6
9	Exercises	8
9	Discussion question	1
10	Questions	0
10	Discussion question	0

Table 2: Correlation coefficients (Pearson) between the dependent (Y) and the independent variables

	Y	VW	TM	ED
Economics	0.05	-0.15	0.04	-0.27*
International Management	-0.04	0.07	0.15	0.05
Management	-0.01	0.06	-0.18	0.18
Y		0.26*	0.39*	0.29*
VW			0.28	0.14
TM				0.17

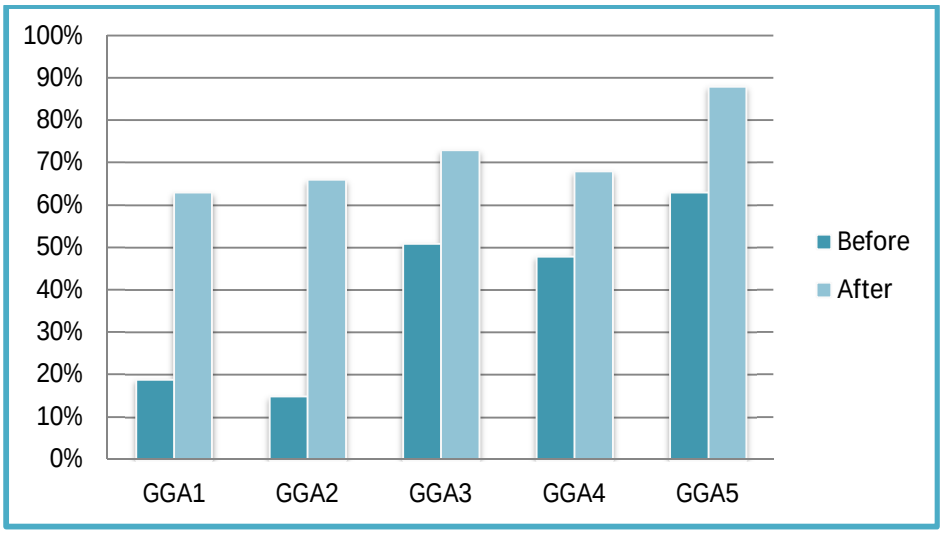
* = significant at the 5% level

Table 3: Ordinary least squares estimation of the multivariate model (1)

α_0	α_1	α_2	α_3	α_4	R^2
10.39**	2.76*	0.01**	0.45**	2.79	0.23
(0.027)	(0.051)	(0.042)	(0.024)	(0.168)	

n = 76; p-values in brackets: * = significant at the 10% level; ** = significant at the 5% level; *** = significant at the 1% level

Figure 1: Percentage of students achieving a high level of proficiency (level 4-5) in each GGA

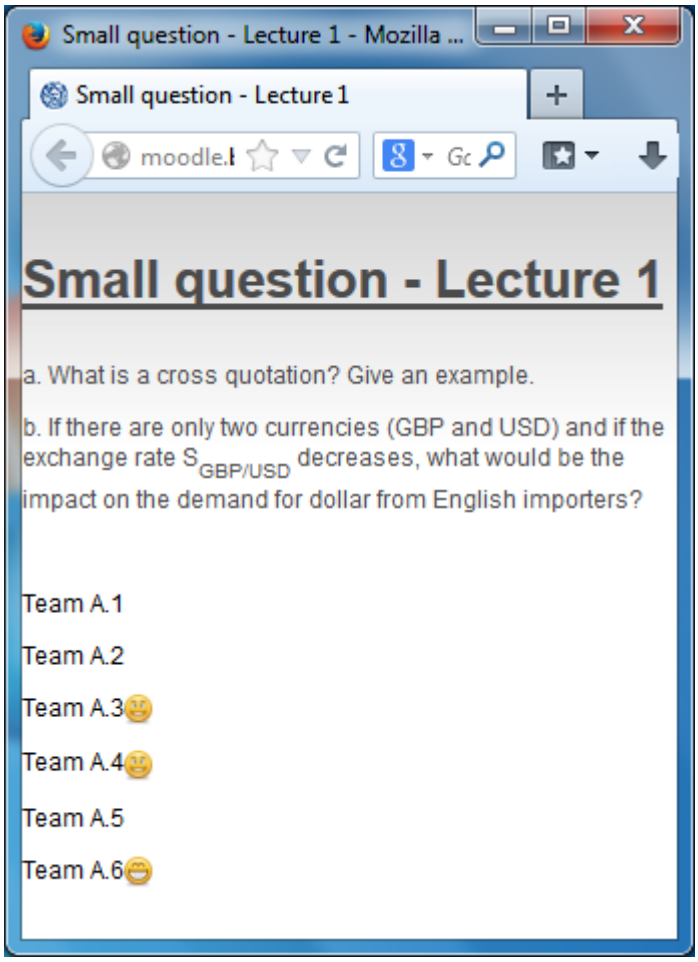


Before refers to data from the first survey (beginning of semester) and *After* refers to responses from the second survey (end of semester)

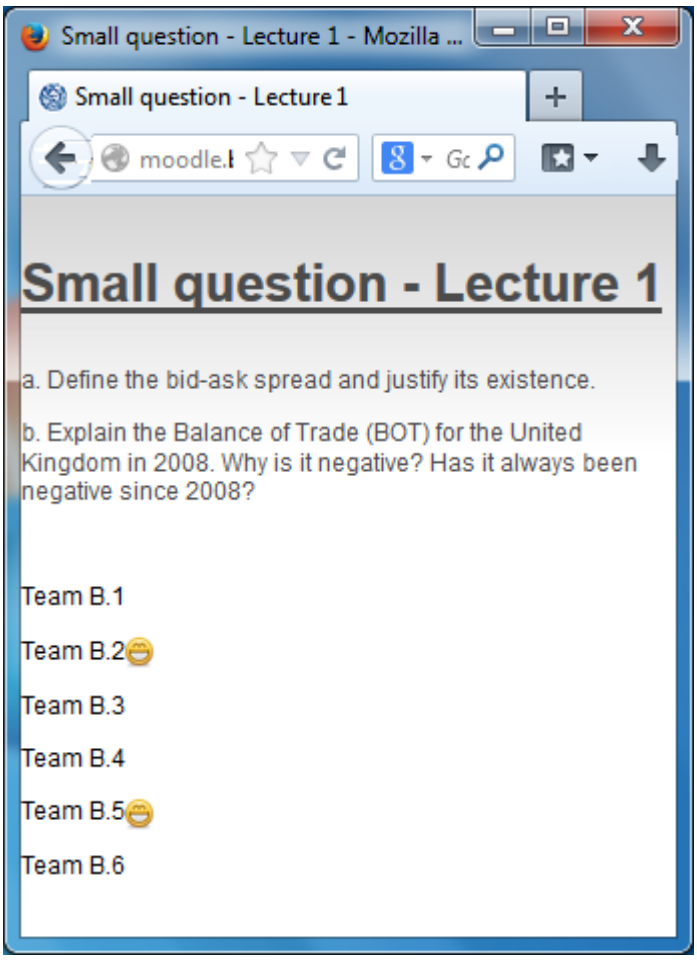
Appendix: Examples of wiki-based tasks

In this Appendix, we present two wiki-based tasks. The first task is called “Small question – Lecture 1” and provides different questions for each seminar group. This task is typical as similar small questions were asked for each seminar every week. Questions for seminar groups A and B are reported below.

Seminar A:

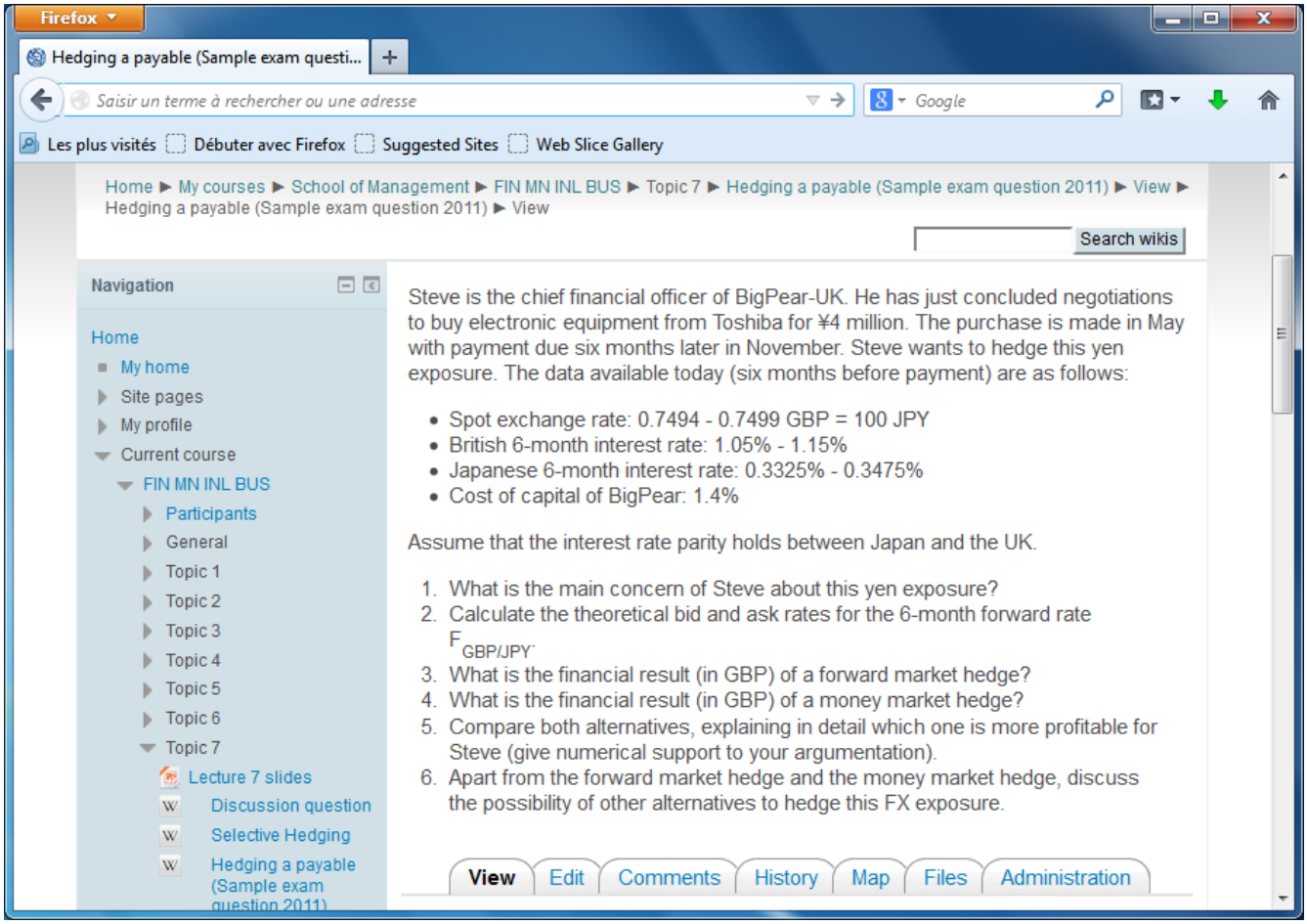


Seminar B:



In each group there are 6 teams, and student answers can be accessed by clicking on each team’s name. Typically, the seminar tutor would read all answers before the seminar and give feedback in-class and out-of-class. The smiley face next to a team’s name corresponds to feedback from the seminar tutor as she flagged the best answers for students’ future review.

The second task is called “Hedging a payable” and is based on a past exam paper question. The screen print of the task is reported below. This exercise was the same for all seminar groups and allowed students to practice for the final exam. In addition to usual feedback from the seminar tutor, the lecturer subsequently used this wiki-based task to provide further feedback during a revision session.


Firefox
Hedging a payable (Sample exam questi...
Saisir un terme à rechercher ou une adresse
Google
Les plus visités
Débuter avec Firefox
Suggested Sites
Web Slice Gallery
Home ▶ My courses ▶ School of Management ▶ FIN MN INL BUS ▶ Topic 7 ▶ Hedging a payable (Sample exam question 2011) ▶ View ▶
Hedging a payable (Sample exam question 2011) ▶ View
Search wikis
Navigation
Home
My home
Site pages
My profile
Current course
FIN MN INL BUS
Participants
General
Topic 1
Topic 2
Topic 3
Topic 4
Topic 5
Topic 6
Topic 7
Lecture 7 slides
Discussion question
Selective Hedging
Hedging a payable (Sample exam question 2011)
Steve is the chief financial officer of BigPear-UK. He has just concluded negotiations to buy electronic equipment from Toshiba for ¥4 million. The purchase is made in May with payment due six months later in November. Steve wants to hedge this yen exposure. The data available today (six months before payment) are as follows:
Spot exchange rate: 0.7494 - 0.7499 GBP = 100 JPY
British 6-month interest rate: 1.05% - 1.15%
Japanese 6-month interest rate: 0.3325% - 0.3475%
Cost of capital of BigPear: 1.4%
Assume that the interest rate parity holds between Japan and the UK.
1. What is the main concern of Steve about this yen exposure?
2. Calculate the theoretical bid and ask rates for the 6-month forward rate $F_{GBP/JPY}$.
3. What is the financial result (in GBP) of a forward market hedge?
4. What is the financial result (in GBP) of a money market hedge?
5. Compare both alternatives, explaining in detail which one is more profitable for Steve (give numerical support to your argumentation).
6. Apart from the forward market hedge and the money market hedge, discuss the possibility of other alternatives to hedge this FX exposure.
View
Edit
Comments
History
Map
Files
Administration