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Building Effective Small-Group Team Working Skill through Blended Learning at Malaysia Tertiary Institution

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Abstract

Many Malaysian employers blamed the teaching methods used in the institutions of higher learning as being too theoretical and exam-oriented (Shah, 2008) and thus, failed in training students to meet the workplace needs. One such need was team working skill and lack of this skill would jeopardise the survival of a company in a competitive global business environment. As e-learning has been identified as a tool that can get every member to discuss equally, promote deeper learning and enable collaborative learning (Murphy, 2004; Wang and Woo, 2007), most campus-based institutions have embarked on the use of the technology in complementing their classroom learning. This has led to the formation of blended learning that provides new experience for students in building teamwork. The important question raised was how the approach of blended learning would help students developing their teamwork skills. Based on the theoretical framework of constructive alignment (Biggs, 1999), a qualitative case study research was developed. This study investigated closely how to develop effective small-group team working skill among students working in a blended mode. The findings revealed were very encouraging as each group worked as a team both online and face-to-face in completing their assignments.

1. Introduction

The early report from the Third Outline Perspective Plan (OPP3) has already set a target for Malaysia to become a knowledge-based economy and a developed nation by 2020 (Arabee and Mansur, 2006). As a knowledge-based economy, Malaysia requires highly educated workers and thus, its goal is to have 40 percent of the school leavers to enter higher learning institutions by 2020 (Department of Prime Minister, 2010). However, the challenge is not about producing graduates to meet the economic demands but having graduates without employability skills.

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2.   Employability skills and blended learning

Some comments from the industries blamed the teaching methods used in the institutions as being too theoretical and exam-oriented (Shah, 2008) and thus, developing low-level interpersonal communication skill (Mukhtar, et. al., 2009) which is essential for working effectively in a team. Lack of this skill would jeopardise the survival of a company in a competitive global business environment. In higher learning institutions, the common practice by the lecturers in initiating students working in groups is to divide the students into small groups. However, in many cases, there is a tendency that group participation is dominated by a few assertive individuals and thus, opinions and discussions are not equally shared among all group members. In addressing the problem of team working, some researchers (Murphy, 2004; Wang and Woo, 2007) suggest the use of e-learning as a tool that can get every member to discuss equally, promote deeper learning and enable collaborative learning. As most campus-based institutions have embarked on the use of online learning in complementing their classroom learning, this combination leads to the formation of blended learning. The term blended learning connotes various definitions. A definition that fits this study is from Collis and Moonen (2001) who describe the online component in blended learning as a natural extension of classroom learning. Other authors are Littlejohn & Pegler (2007) who refer the word "blend" to the proportion of e-learning content within the course.

3.   The graduate attributes of UTM employability skills

In Malaysia, the efforts to increase graduates' competencies are led by the institutions of higher learning and encouraged by the Ministry of Higher Education (MOHE) by developing a module about generic core competences (Ministry of Higher Education, 2006) that encourages institutions of higher learning to focus on developing employability skills of students. It allows the teachers to decide how these skills should be delivered within the curriculum and course syllabus. Based on this module, University Technology Malaysia (UTM) took a positive approach in developing the skills. UTM outlined seven important employability skills comprising the communication, team working, problem solving, adaptability, life-long learning, self-esteem and ethics and integrity. These skills help the graduates to articulate more effectively their abilities to work in a new workplace upon their graduation. Among the seven employability skills outlined by UTM, team working was the main focus in this study. The lecturers are encouraged to lead their students on how to complete assignments in groups. As group assignments are usually very challenging, teamwork skill is vital. Within teamwork, all members must work together until the task is completed and their project is graded. Online learning is a collaborative tool that offers a discussion board for teamwork. It has the capacity to promote deeper learning and enable collaborative learning (Murphy, 2004). According to McConnell (2005), through collaborative learning, students will generally achieve better working in group rather than learning individually or competitively with others.

4.   The research question

When the flexibility use of online learning is integrated with face-to-face method, it provides new experience in building teamwork. Thus, the main objective of this study was to build an effective small-group team working skill among students working in a blended mode. The research question was how the approach of blended learning would help students developing their teamwork skills?

5.   Applying constructive alignment

In developing a theoretical framework, a concept called 'constructive alignment' was adapted in this study. The term is derived from Biggs (1999) who defines it as a good teaching system that aligns teaching method and assessment to the learning activities stated in the objectives, so that all aspects of this system are in accord in supporting appropriate student learning' (p.11). According to Tepper (2006), constructive alignment integrates

instructional design (Cohen, 1987) and constructivist principles (Glasersfeld, 1996) so that the assessment tasks are not only aligned with the learning outcomes but the teaching and learning activities as well. In a context of this study, the main objective of a blended learning course is to enable students working in a blended mode. It means each group should successfully construct knowledge through interactions that aligns the classroom and online learning activities (see figure 1).
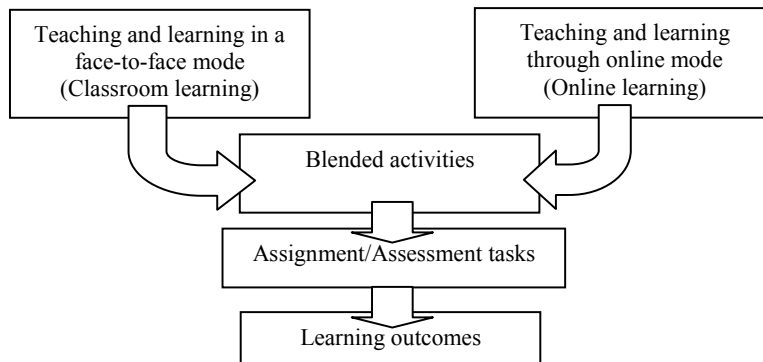

Figure 1: Using the concept of constructive alignment (Biggs, 1999) to align both classroom and online activities so as to achieve the intended learning outcomes.

6. Previous research

There are various research on blended learning that prove working in blended learning could develop team working skills (Bonk, et. al., 2002; Jonesa and Cookeb, 2006). Bonk, et. al. (2002) investigated how a blended approach which comprised the technology of online learning (synchronous and asynchronous) and the traditional classroom were used to train students within a professional development context in a high-level military course. Jonesa and Cookeb (2006) conducted an in-depth qualitative analysis of students' experiences using an online discussion in two separate case studies. Both studies reveal a new insight that the real potential of blended learning strategy can be exploited to develop team working skill. Besides studies that related to employability skills, there are studies that look at the teachers' perspective on the integration of online learning into classroom learning (Stacey and Wisenberg, 2007; Brill and Galloway, 2007). Using a qualitative survey, Stacey and Wisenberg (2007) compared the teachers' perspectives teaching both online and face-to-face in a higher education context. The differences between the two approaches were compared. Brill and Galloway (2007) examined teachers at colleges on how they integrated the online technology in their classroom. The data were collected through survey and interviews, and the findings showed positive impacts of the online integration with the classroom and served as a practical recommendation for future technological use.

7. The research design

A case study qualitative approach was adapted. The research was conducted within the university and as an action researcher, the author was directly involved in designing and teaching the module – an educational multimedia subject. The delivery format of the module was a weekly two-hour lecture over 15 weeks. The blended learning strategies that facilitated a meaningful integration of online and face-to-face activities working on two assignments in a semester-long team project were the main focus. A purposeful sampling of twenty-five (25) students studied the module was taken. The class was further divided into small groups comprising three to five students. The two assignments required the students to work in permanent learning groups throughout the semester (table 1).

Table 1: The two assignments for the educational multimedia subject

Assignment	Tasks
1	The assignment required every group to produce Courseware Documentation, for example, documents that are needed before and during the development process of the courseware. To include the following items.
2	Based on what the groups proposed in the documentation for assignment 1, the actual courseware prototype was developed in the form of educational multimedia courseware. Each group determined their own topic which had to relate to students' subject discipline groups.

8. The research instruments

Two important research instruments, the online forums (to gather online discussions through the transcripts of the online forum) and the face-to-face meeting reports (to gather the face-to-face discussions) were used in this study. Through the university e-learning platform, the students could communicate asynchronously by posting their messages in the online forums, and the messages became threaded with topic headings or titles. A close examination of the transcripts of the online threaded discussions provided a significant insight into the students' learning and interactions. Besides online threaded discussions, face-to-face meeting reports prepared by the groups were also examined. It was important for the students to ensure that their discussion in the face-to-face meetings were productive. At the end of the semester, an interview was conducted with each group leader - to get a clearer picture of how the group members worked as a team in completing their assignments.

9. Promoting team work among group members

In order to get the group to work as an effective collaborative team, a learning contract and netiquette were introduced. The learning contract was a formal written agreement intended to support collaboration and was given to the teacher (the researcher) once it was completed and each group member kept a copy. According to Berggren and Söderlund, (2008), the contract also helps the teacher and the students to evaluate whether they met the learning and teaching objectives. Netiquette is the code related to acceptable and courteous behaviour when interacting with others online. Online interaction can take different forms, such as chat, social networking, formal discussion and the students need to be aware that of the need for appropriate postings within the course discussions (Wang and Woo, 2007).

10. Conducting pilot study

The research literature on online discussion in learning has proliferated using content analysis to analyse the nature and quality of the online discussions. According to Hara, et. al. (2000), content analysis has been the popular approach used by many researchers analysing online discussions (Henri, 1992; Gunawardena, et. al., 1998, Garrison, et. al., 2000). Corich, et. al. (2005) describe the category of content analysis developed by Henri (1992) and Garrison, et. al. (2001) had been mostly referred by researchers. However, using content analysis to analyse both online and face-to-face discussion was rare and inadequate from previous studies. Thus, the aim of this pilot cycle was to develop a new *procedure* that could address the incorporation of online and face-to-face discussion analysis. In analysing the data from the transcripts of the online forum discussions and the reports of the face-to-face meetings, the researchers formulated the following stages - (1) summarising the online discussions into learning activities and then identifying these learning activities as learning strategies; (2) identifying learning strategies from the summaries of the face-to-face meeting reports submitted by the groups; and (3) deriving learning activities conducted in a blended mode from the analysis. This pilot study was conducted on a single small group of four members.

10.1. Summarising online and face-to-face discussions

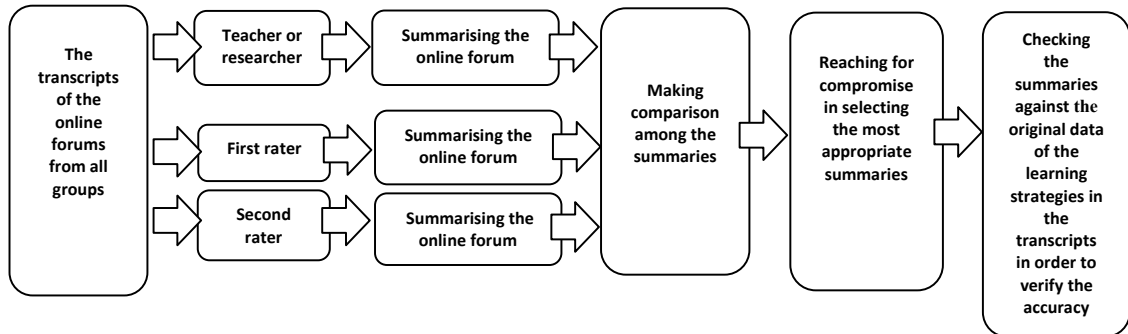The process of summarising online discussions is shown in figure 2.

Figure 2: The process of the summarising the learning strategies from the transcripts of the online forums

Before the transcripts of the online discussions from each group could be analysed, each had to be summarised. Two teachers who had experiences in teaching the module in a blended mode were selected as raters to summarise the same online forums. While doing the summaries, the raters were advised to focus on the learning activities on completing the assignments in groups. Comparisons were made at an inter-rater meeting to see if there were any contradictions in their summaries and they reached a compromise in finalising the summaries. The process involved a final check against the online discussion transcripts. While the transcripts of the online forum provided the students' online discussions, their face-to-face discussions were recorded in the meeting reports. The purpose of the face-to-face discussions was to complement the online discussions. The meeting reports were intended to reveal the frequency with which the group met face-to-face. Each group was required to submit their face-to-face meeting reports at the end of the semester.

10.2. Using the table for blended activities

In order to visually identify the learning activities from the summaries of the online and face-to-face discussions conducted in blended mode, a new instrument called the *table for blended activities* was developed. Both the summaries of the online activities from the transcripts and the summaries of the face-to-face activities from the meeting reports of the first group were placed in this table (table 2).

Table 2: The table shows an example of how the online and face-to-face learning were placed in the table for blended activities.

Week	Meeting/Discussion/Communication	Mode	Strategies
Week 1	• Brief meeting after the class	• Face-to-face	• Getting to know group members from other courses for the first time. **Group Leader** (GL) fixed the time and date to meet of the next meeting.
Week 2	• Brief meeting after the class	• Face-to-face	• Planning for a face-to-face meeting but the group was unsure as other members had unsettled matters with the schedule of other subjects; exchanging of mobile phone numbers among members.
	• Communication on mobile device	• Text messaging	• GL sent text messages reminding the group to meet up the following week right after the class.

10.3. Deriving learning activities in blended mode

Based on table 2, the students' learning activities conducted in blended mode were identified. For example, when a learning activity on discussing the topic for the assignment was found both in the online and face-to-face discussion, it was considered as a blended activity. Based on the summaries of the learning activities from the online forums and face-to-face meeting reports, a total number of 13 blended learning strategies were identified.

11. Conducting research study

The process of summarising learning activities from the online and face-to-face discussions was the same as conducted in the pilot cycle.

11.1. Formulating the coding

A total of 28 learning strategies identified from the analysis were used as an initial basis for the coding. The researchers used the "bottom-up" approach outlined by Creswell (2008) to group the learning strategies into specific categories and general themes. Firstly, we divided the strategies into six main strategy categories. The strategy categories were motivation, socialisation, introduction, organisation, brainstorming and assignment engagement. Secondly, the strategy categories were further grouped into three main themes. The themes were action planning (AP), group development (GD), and task-related (TR) (see table 3).

Table 3: The learning strategies were classified according to the themes and strategy categories

Themes	Strategy Category	Strategies
Action Planning [AP]	1. Reminders [AP]	1.1. Reminder of the face-to-face meeting
		1.2. Reminder of the online meeting
		1.3. Reminder of the due date for the assignment
	2. Scheduling [AP]	2.2 Scheduling the date, time and venue for the face-to-face meeting
		2.3 Scheduling the date and time for synchronous online meeting
	3. Confirmation [AP]	3.1. Confirming the date, time and venue for the face-to-face meeting
		3.2. Confirming the date and time for synchronous online meeting
	4. Communication [AP]	4.1. Communicating through asynchronous online forum in a synchronous mode
Group Development [GD]	5. Motivation [GD]	5.1. Appreciating the group' efforts/works in completing the assignment
	6. Socialisation [GD]	6.1. Welcoming new members to the group
		6.2. Welcoming the existing members back to the group for discussion and/or working on the assignment
Task-related [TR]	7. Introduction [TR]	7.1. Introducing working procedures for the group members
	8. Organisation [TR]	8.1. Identifying strengths and skills of the group members
		8.2. Assigning/dividing tasks to the group members
	9. Brainstorming [TR]	9.1. Brainstorming for the assignment topic
		9.2. Brainstorming for the assignment materials
		9.3. Specifying one thread of online forum for specific topic of discussion
	10. Assignment Engagement [TR]	10.1 Developing the storyboard for the courseware
		10.2 Developing the subject content for the courseware
		10.3 Developing the multimedia content (audio, video, animation, graphics, etc) for the courseware
		10.4 Developing the courseware interfaces (main menu, sub-menu, exercises, glossary, etc)

10.5   Uploading/posting the courseware interfaces (main menu, sub-menu, exercises, glossary, etc) in the forum

10.6   Uploading/posting multimedia files (montage, animation, etc) in the forum

10.7   Posting/sharing document file(s) for discussion/compilation with group members

10.8   Discussing the compatibility of the file formats with the authoring software
10.9   Identifying any compatibility problems of the file formats with the authoring software
10.10 Rectifying any compatibility problems of the file formats with the authoring software.
10.11 Checking the flow of the content materials of the assignment

From this new coding, a blended learning strategies map was developed. The coding process involved using [Theme-Strategy Category-Learning Strategy] labels. For example, if the learning strategy of 10.8 (discussing the compatibility of the file formats) was discovered in the table of blended activities of the group, it was coded as [TR-ASSIGNMENT-10.8] (see table 4).

11.2. Labeling learning strategies

To begin with, the coding strategy was applied in the *table for blended activities* for group 1 according to the starting date of the discussion or meeting. The learning strategies that assisted the blended learning process, for example ensuring the online and face-to-face activities were fully integrated, were then identified and this process is described here and illustrated through the example of group 1 as shown in table 4. Group 1 met face-to-face in the first week where all members contributed their draft ideas on the most suitable topic for their assignments. In week 3, the members continued to contribute their ideas in the threaded discussions in their online forums. The strategy 9.1 [TR-BRAINSTORMING-9.1] was labelled in both places. The labelling was done throughout the semester (15 weeks) (table 4).

Table 4: An example of labeling the learning strategies for group 1

Group 1
No. of Group Members: 4
Course: CDROM-Based Multimedia Development

Week	Meeting/ Discussion/ Communication/ Event	Mode	Strategies
Week 1	• Classroom Meeting	• Face-to-face	• During the class, the teacher made two important announcements. First, all the students must sit for an English cloze test. Second, the proposed group leader must submit the list of their group members to the teacher and through online.
	• Brief meeting after the class	• Face-to-face	• Getting to know group members from other courses for the first time [GD-SOCIALISATION-6.1]. The group also exchanged mobile phone numbers among members [AP-COMMUNICATION-4.1]. Junainah scheduled the time, date and venue for the first meeting to start discussing their assignments. [AP-REMINDER-1.1][AP-SCHEDULING- 2.1]. Junainah informed the group that she would be sending the list of the group members to the teacher by hand and through online forum.

	• Meeting for Assignment 1	• Face-to-face	• In the first meeting, the group got to know each other further especially identifying the members' expertise in developing the courseware using authoring or programming software [ADDED LEARNING STRATEGY] [TR-ORGANISATION-8.1]. They discussed the coursework requirement (completing 3 assignments) throughout the semester. At this point, the group leader would be appointed based on their English cloze test. Junainah acted as a temporary group leader. Junainah led the discussion and began assigning tasks to each member [TR-ORGANISATION- 8.2]. For the first task in this meeting, all members contributed their draft ideas on thinking the most suitable topic for their assignments [TR-BRAINSTORMING-9.1]. For each topic the group proposed, they also provided ideas as to where the sources were easily available [TR-BRAINSTORMING-9.2]. As a start, the group planned to develop an interface for credit ending for Assignment 1, 2 and 3. This credit ending would include the photos and profiles of the group members as developers [ADDED LEARNING STRATEGY][TR-ASSIGNMENT-10.3].
	• Sending email through e-learning	• Online	• The group sent the names of his group members through message to the teacher through-learning
Week 2	• Classroom Meeting	• Face-to-face	• The teacher announced that the result of the English cloze test would be released soon. However, no specific date was stated.
	• E-learning announcement	• Online	• The teacher announced in the elearning that the appointment of the group leader would be based on the result of English cloze test.

After the table of blended activities for the first group was coded using the blended learning strategies map, this was then repeated for the remaining the 3 groups.

11.3. Analysing the table for blended strategies from all groups

In order to identifying blended learning strategies, for example, ones that supported the integration of online and face-to-face learning the learning strategies in the tables for blended activities from groups 1 to 4 were reviewed to identify whether the learning strategies were conducted either in face-to-face or online mode or both. Learning strategies that were marked in both modes were likely to be ones that were fully blended. Part of the outcomes of this analysis is shown in table 5.

Table 5: The learning strategies that were marked in the table for blended strategies for group 1, 2, 3 and group 4

Themes	Strategy Category		Strategies
Action Planning [AP]	11. Reminders [AP]	1.4.	Reminder of the face-to-face meeting
		1.5.	Reminder of the online meeting
		1.6.	Reminder of the due date for the assignment
	12. Scheduling [AP]	2.4	Scheduling the date, time and venue for the face-to-face meeting
		2.5	Scheduling the date and time for synchronous online meeting
	13. Confirmation [AP]	3.3.	Confirming the date, time and venue for the face-to-face meeting
		3.4.	Confirming the date and time for synchronous online meeting
	14. Communication [AP]	4.2.	Communicating through asynchronous online forum in a synchronous mode
Group Development [GD]	15. Motivation [GD]	5.2.	Appreciating the group' efforts/works in completing the assignment
	16. Socialisation [GD]	6.3.	Welcoming new members to the group
		6.4.	Welcoming the existing members back to the group for discussion and/or working on the assignment
	17. Introduction [TR]	7.2.	Introducing working procedures for the group members
	18. Organisation [TR]	8.3.	Identifying strengths and skills of the group members

		8.4.	Assigning/dividing tasks to the group members
	19. Brainstorming [TR]	9.4.	Brainstorming for the assignment topic
		9.5.	Brainstorming for the assignment materials
		9.6.	Specifying one thread of online forum for specific topic of discussion
Task-related [TR]	20. Assignment Engagement [TR]	10.12	Developing the storyboard for the courseware
		10.13	Developing the subject content for the courseware
		10.14	Developing the multimedia content (audio, video, animation, graphics, etc) for the courseware
		10.15	Developing the courseware interfaces (main menu, sub-menu, exercises, glossary, etc)
		10.16	Uploading/posting the courseware interfaces (main menu, sub-menu, exercises, glossary, etc) in the forum
		10.17	Uploading/posting multimedia files (montage, animation, etc) in the forum
		10.18	Posting/sharing document file(s) for discussion/compilation with group members
		10.19	Discussing the compatibility of the file formats with the authoring software
		10.20	Identifying any compatibility problems of the file formats with the authoring software
		10.21	Rectifying any compatibility problems of the file formats with the authoring software.
		10.22	Checking the flow of the content materials of the assignment

The analysis of the blended strategies reveals key differences between the learning strategy modes. For the action planning theme, only a few groups used a blended mode. Group 1 worked the most in a blended mode, for example within learning strategies 1.1, 1.3, 3.1, 3.2 and 4.1. For the group development theme, only group 1 worked totally in a blended mode. The rest of the groups worked either in a face-to-face mode or online mode for selected learning strategies. It was in the task-related theme that the blended learning strategies pre-dominated for most groups. However, there were differences in use between the groups. The differences between groups are shown in table 6 which presents the blended learning strategies used by each group.

Table 6: The number and type of blended strategies used by the groups.

Group	The types of learning strategies conducted in a blended mode			Number of blended strategies
	Action Planning [AP]	Group Development [GD]	Task-related [TR]	
1	1.1, 1.3, 2.1, 2.2, 3.1, 3.2, 4.1	6.2	8.1, 8.2, 9.1, 9.2, 10.1, 10.2, 10.3, 10.4, 10.8	17
2	3.1		9.1, 10.1, 10.2, 10.5, 10.6, 10.8	7
3	1.1		9.1, 9.2, 10.1, 10.2, 10.6	6
4	2.1		10.4, 10.5, 10.7, 10.8	5

The only learning strategies that were conducted in a face-to-face mode by all groups were 10.9, 10.10 and 10.11. Group 1 was the most frequent blended learning strategy user as they used 19 blended strategies. Apart from learning strategies 9.3, 10.5 and 10.6, group 1 preferred to work on the task online.

11.4. Interviews with the group leaders

The interview was conducted separately with each group leader according to the schedule. The key question asked was how the group worked in a blended mode. The perceptions on working in a blended mode were derived from the responses from the group leaders. In general, all group leaders acknowledged the significance of the online forum to communicate and discuss their assignments alongside the face-to-face meeting. The key points mentioned were the advantage of online mode in complementing face-to-face discussions and to keep in constant contact with the group members. For group 2, the e-learning platform provided the flexible use of the

online forum for communication that was not bounded by time and space, and thus, their discussions became flexible as they could communicate at any time. Group 4 believed that the online forum helped the students to communicate not just among group members but they could seek advice from the teacher. Since the use of mobile phones has become so prevalent in our everyday life, making a call or sending a text message helped the students to work on their assignments. All leaders mentioned that group members used their mobile phones to support their work, for example, to arrange both online and face-to-face meetings.

From the aspect of completing the assignments, there seemed to be a pattern in how the students communicated in the online forum and met face-to-face throughout the two assignments. For the first assignment, the students generally started to meet face-to-face when they attended the class. Then, they used the online forum to extend their face-to-face sessions. Thus, they managed a balanced use of online and face-to-face mode. However, group 4 was an exception. According to the group leader, frequent technical problems with the wireless Internet at their halls of residence led them to use a mainly face-to-face mode. For the second assignment, the groups were dealing with hands-on practical work including developing and testing the prototype which could only be done when they met face-to-face. Their ideas and suggestions on modifying or improving the prototype continued online.

12. Discussions and suggestions

The e-learning is a collaboration tool that offered a discussion board for teamwork. It was expected that the students collaborated effectively and valued the online as well as the face-to-face aspects of the collaborative work. In encouraging meaningful participation rather than sending high numbers of unhelpful postings, the students were informed that it was the quality of discussion that was to be taken into account in the assessment rather than the quantity of messages being posted on the forum. Besides using online forum as a platform to convey ideas or thoughts in text, some groups used it to upload materials such as documents and multimedia files. It seemed effective for the group as they did not have to wait until the next face-to-face meeting to discuss the materials and to engage in further discussion. According to Chin and Anderson (2005), e-learning is highly interactive as it helps students not only to improve their communication skills but their IT skills as well. Hara, et. al. (2000) describe the asynchronous online forum as providing students with opportunities for more thought, reflection and processing of information. Although the teacher's role was to create the space for the students' discussion, the student's role was to take charge of their own discussion. Through the online discussion forum, Prain and Lyons (2000) indicate that students could exchange various views from simple discussion to complex ideas. These exchanges provide an effective interaction in exploring the topic and course content (Honey, 2001) and with the assistance of the teacher, the students are gradually constructing meaning and understanding knowledge (Rowntree, 1997). Thus, the intention of the collaborative work was to generate deeper levels of understanding (Chang and Fisher, 2003).

There is a considerable literature on working in a blended mode that could be referred as background to the strategies the students used to integrate both face to face and online which were covered within the learning strategies map. For example, in a study of blended learning on second year psychology students, Ellis, et. al. (2007) introduced blended discussions where classroom discussions were extended to online environment. The questions or issues which were discussed earlier in class continued in the online forums and the students were encouraged to start their own threaded discussions. Some marks were allocated to face-to-face discussions and online postings. According to Ellis &Calvo (2004, 2006) and Ellis, at. al. (2004, 2008), when the students perceived discussions as a learning process to enhance their understanding about a topic, they were likely to achieve learning outcomes. Thus, Bliuc, et. al. (2010) suggest that learning activities should be structured to include both online and face-to-face environments.

However, some groups were found not using the online forum systematically which led to the occurrence of an arbitrary communication pattern across different threads. The suggestion was if they wanted to start discussing the interface of the main menu, then they should create a new thread. This strategy would enable the students to contribute easily their ideas and to see how their ideas developed over time. The advantages were (1) the group discussion would be more focussed, (2) the members could respond to the previous comment easily, (3) the group could follow the directions of the discussion, and (4) the discussion would be organised and (5) content-rich. There was also a need for the greater guidance on the effective use of the online forum. The students had to know when to contribute their opinions to a discussion, how to read other members' feedback meaningfully, and how to respond cordially to any ideas brought up by the group. O'Leary (2005) suggests each student should be assigned with different roles such as summariser, coach, guide, encourager, cheerleader and recorder. In a face-to-face context, the students hold the same roles. Some roles have the advantage of engaging students with 'deeper learning' than others. The outcome of the online text-based discussion could then be effectively used at the face-to-face meetings to support the on-going group work. The forum was to provide a record of work already completed. The online transcript had to be well organised so that the thread would be easy to follow.

13. Conclusion

This study has introduced a new method on how to measure both online and face-to-face learning activities in a blended mode. This is consistent with the approach of UTM, as a campus-based university, to promote the use of e-learning alongside classroom learning among the lecturers and the students in developing their employability skills especially working collaboratively as an effective team. Under the Tenth Malaysia Plan (2010 – 2015), the Malaysian government has taken initiative establishing a training program called the Industrial Skills Enhancement Program (INSEP) helping unemployed graduates to equip themselves with industrial skills. It is important to suggest the government to include programs for students at tertiary institutions to work effectively using blended learning. A guideline could be developed not only to keep the on-campus students in constant contact with their peers and lecturers but to lead them working in group effectively. The guideline will also become a main reference to the UTM lectures as a systematic mechanism before they plan to conduct any learning activities through online learning. It is expected that the students will be more organised both working effectively in small-groups and working systematically through blended learning.

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